

# The McKenzie Method

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Who is Robin McKenzie?

# History MDT

- Robin McKenzie

- Physiotherapist from New Zealand

- Dr. Cyriax

- strong influence on McKenzie's initial training

- considered the framework for MDT

- Clinical experience

- Mr. Smith 1956 – 2 weeks of radicular sx then serendipitous surprise

- Exploration of End Of Range - some improved, while others worsened

# History - cont

- Over next 20 years developed approach
- Began teaching approach 1977 Rancho Los Amigos
- McKenzie Institute formed in 1982
- 26 branches around the world

# Epidemiology

- 50-80% population experience back pain
- Peak prevalence 40-50 years of age and tapers after that
- Csp -Women tend to be affected more men
- Lsp – Men tend to more affected than women
- First episodes of sx start in the 20's w/ recurrency rates between 39-71%
- Majority (80-90%) of low back disorders occur at the L4/5 and/or L5/S1
- Most cervical disorders are found in the lower region with 41% occurring at the C5/6 level and 33% at the C6/7 level
- When the nerve root is affected, 36.1% involve the C6 root (C5-6 level), 34.6% C7 (C6-7 level) and 25.2% C8 (C7-T1 level)

# Quebec Task Force Reports

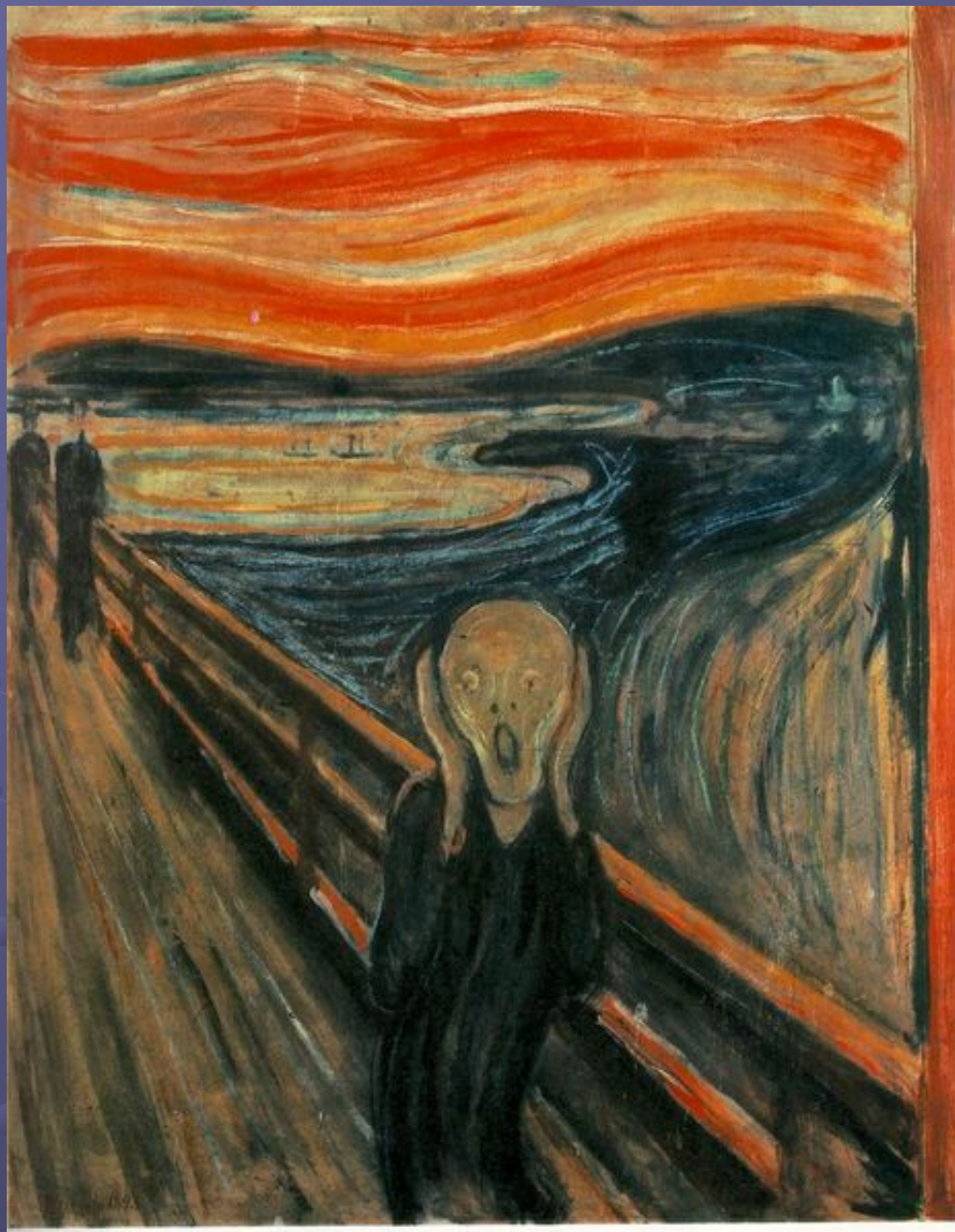
- Spine; 1987 – Comprehensive Scientific, Multi-disciplinary Investigation
- Most spinal disorders are non-specific
- Classify by pain patterns

**Spitzer WO. Scientific approach to the assessment and management of activity-related spinal disorders: A mono-graph for clinicians. Report of the Quebec Task Force on Spinal Disorders. Spine 1987;12(7 Suppl):1-59.**

Class	Symptoms
1	Pain w/o radiation
2	Pain + radiation-proximal extremity
3	Pain + radiation- distal extremity
4	Pain + radiation + neuro signs
5	Nerve root compression -fx, instab
6	Nerve root compression -image, EMG
7	Spinal stenosis
8	S/P surgery-6 months
9	S/P surgery->6 months
10	Chronic pain syndrome
11	Other dx

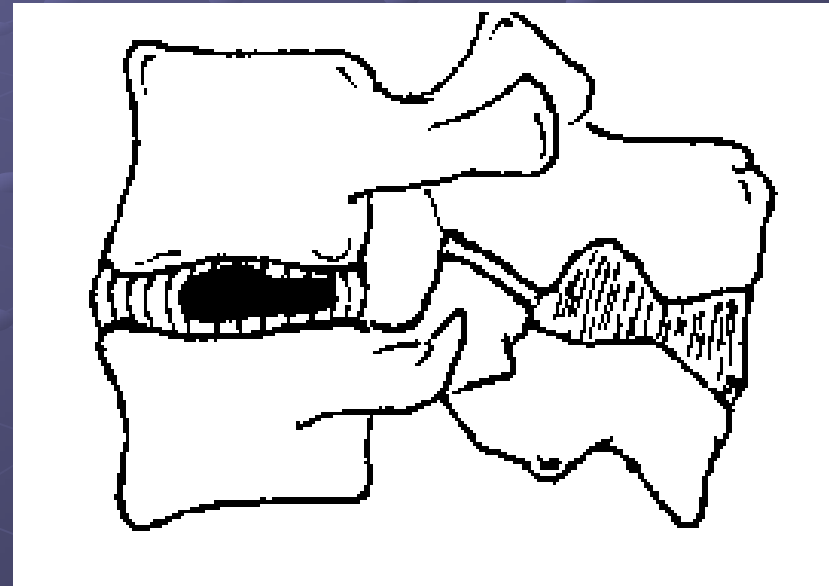


# BIOMECHANICS



# Spinal Motion Segment

- Basic functioning unit of the spine
  - Vertebra
  - Intervertebral discs
    - Annulus fibrosus –
      - Functions to retain nucleus
      - Weakest posterolaterally
    - Nucleus pulposus
      - connecting ligamentous and soft tissue structures.
- Analysis of segment to:
  - Load
  - Position
  - Movement



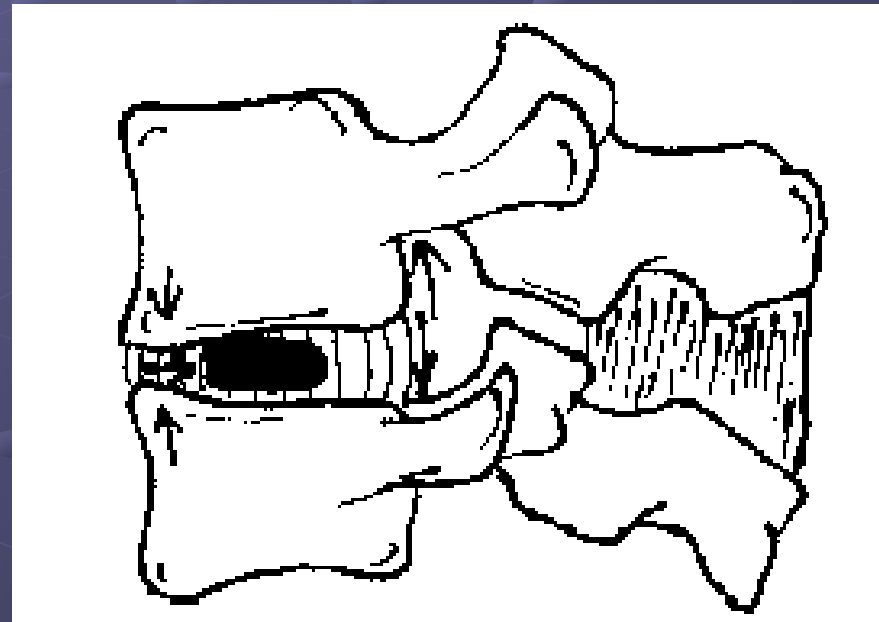
Conceptual Framework:

# DISC MODEL

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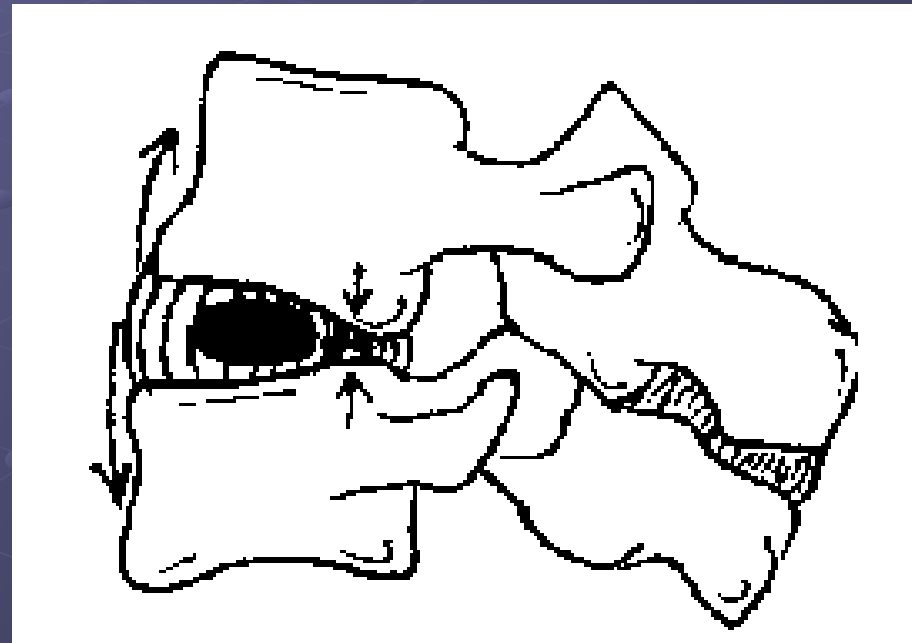
# Conceptual Model - Flexion

- Zygapophyseal joint surfaces distract
  - inferior articular processes of the superior vertebra glide up and forward upon the superior articular surfaces of the vertebra below.
- Anterior loading of the intervertebral disc occurs with compression of the anterior portion, with relaxation and bulging of the outer anterior annular wall.
- The posterior annular wall is stretched and pulled taut.
- The nucleus distorts posteriorly.
- The vertebral canal lengthens, stretching the cord, dura and root filaments and opening the intervertebral foramina.



# Conceptual Model - Extension

- Inferior articular processes of the vertebra above glides down and backward on the superior articular surfaces of the vertebra below.
- Posterior loading of the intervertebral disc occurs with distraction of the anterior portion of the annulus, which is stretched and pulled taut.
- The posterior annular wall is relaxed and there is posterior bulging of the outer, posterior annular wall.
- The nucleus distorts anteriorly.
- The vertebral canal shortens, which relaxes the cord, dura and root filaments, and reduces the size of the intervertebral foramina.



# Literature

Donelson R, Aprill C, Medcalf R, Grant W. A prospective study of centralization of lumbar and referred pain. A predictor of symptomatic discs and annular competence. Spine; 22(10):1115-22, 1997.

- 63 subjects sent for PRE SURGICAL Discogram w/ Gadolinium for confirmation of disc pre surgical diagnosis.

● PT's trained in MDT, did mechanical evaluation. Therapist asked to predict:

- Is the pain discogenic?
- If discogenic then what level?
- If discogenic then was nucleus contained?
- Predict what the disc fissure pattern would look like.

The patients then got the discogram in flexion and extension.

- Comparisons were made between the findings of the Discography and those predicted by the therapist.

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# ● Predicted vs Actual Discogram Results

- Discogenic?

- %Agreement – 83.3%

- Level?

- %Agreement 93%

- Nucleus contained or non contained?


- %Agreement – 85.5%

- Fissure Pattern?

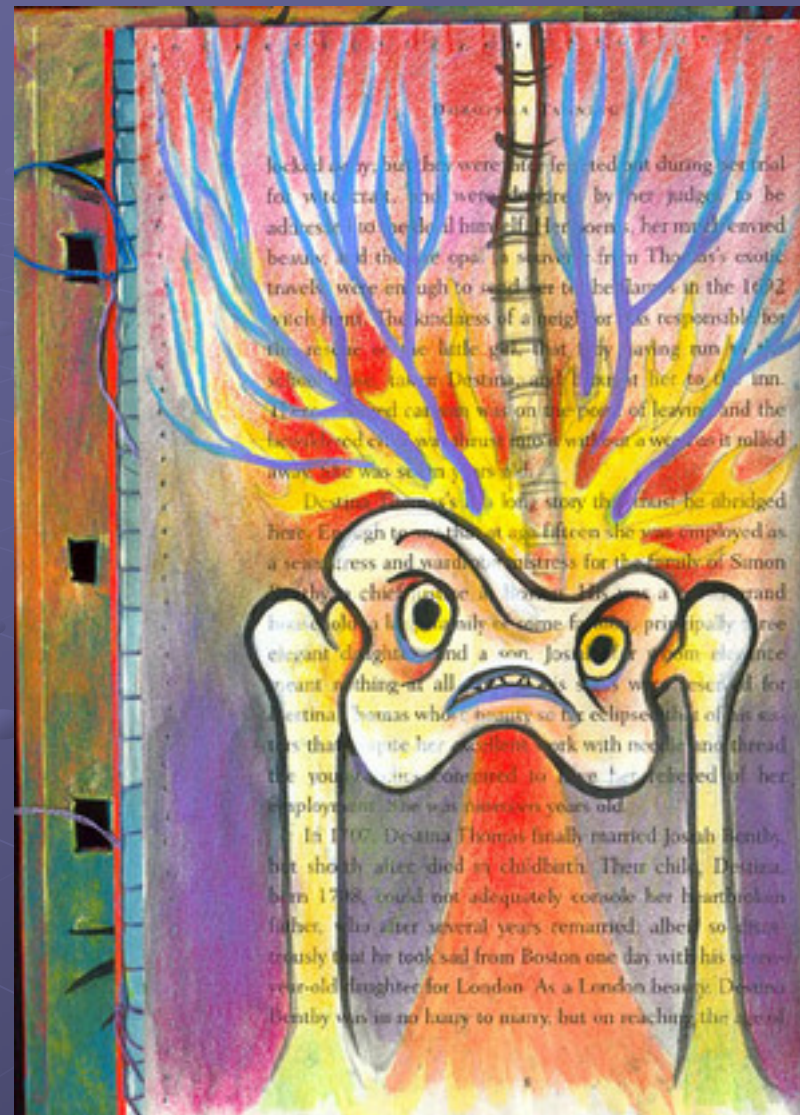
- %Agreement rated good/excellent

# Conclusion

- Dynamic disc injection outcomes are reliably predictable w/ MDT exam and the dynamic internal disc model
- This strongly supports a mechanical cause – effect relationship between IVD dynamics and the symptom response patterns of centralization
- MDT exam appears to be a dynamic, non-invasive functional evaluation of symptomatic disc pathology

The background of the slide features a dark blue gradient with a subtle, repeating pattern of light blue diamond shapes. At the vertices of these diamonds are small, three-dimensional-looking spheres, creating a molecular or crystalline structure that recedes into the distance.

# TISSUE BASED PAIN MECHANISM



locked as yet, but they were later let out during her trial for witchcraft, and were ordered by her judges to be addressed to be done himself. Her looks, her much envied beauty, and the fine opal in her ear from Thomas's exotic travels, were enough to send her to the flames in the 1692 which hints the kindness of a neighbor is responsible for the rescue of the little girl that, by having run to the school in Dartmouth, and then at her to the inn. The colored cat was on the porch of leaving, and the bewitched cat was thrust into it with her a witch as it rolled away she was seen years old.

Destina Thomas's long story that must be abridged here. Enough to say that at age fifteen she was employed as a seamstress and ward of mistress for the family of Simon Bently, chief of the town. Bently is a grand and noble family in some families, principally three elegant daughters and a son, Josiah, who from his infancy meant nothing at all. As his was reserved for Destina Thomas whose beauty so far eclipsed that of his sisters that to spite her excellent work with needle and thread the young man, confined to her, he rebelled of her employment. She was fourteen years old.

In 1707, Destina Thomas finally married Josiah Bently, but shortly after died in childbirth. Their child, Destina, born 1708, could not adequately console her heartbroken father, who after several years remarried, albeit so often that he took sail from Boston one day with his seven-year-old daughter for London. As a London beauty, Destina Bently was in no hurry to marry, but on reaching the shores

- Nociception – stimulation of receptors which provide feedback for pain
  - Mechanical – application of forces that contain the receptors is sufficient to irritate the free nerve endings (pressure, distraction, distension, abrasion, contusion, laceration)
  - Chemical/Thermal - chemical irritation when concentration of chemical substances is sufficient to irritate free nerve endings.
- It is essential to identify the type of pain (chemical or mechanical) because this will establish the tissue state and the subsequent treatment selection

# Clinical Management

## ● Goal:

- Relieve Pain
- Restore Function
- Prevent reoccurrence

# Classification

● Pain of spinal origin can be classified into 3 syndromes.

- Posture Syndrome
- Dysfunction Syndrome
- Derangement Syndrome

# Posture Syndrome



# Posture Syndrome

- End range stress on normal structures
- Mechanical deformation due to prolonged stress eventually produces pain

# Dysfunction Syndrome



# Dysfunction Syndrome

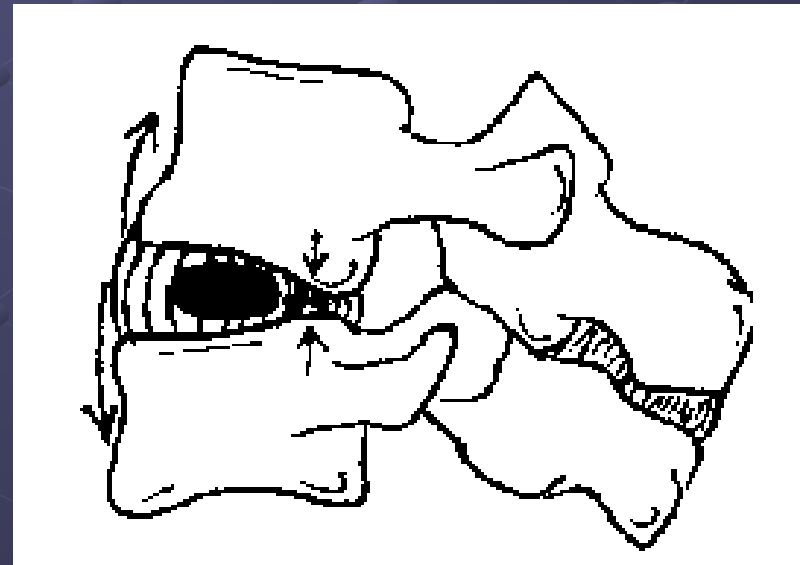
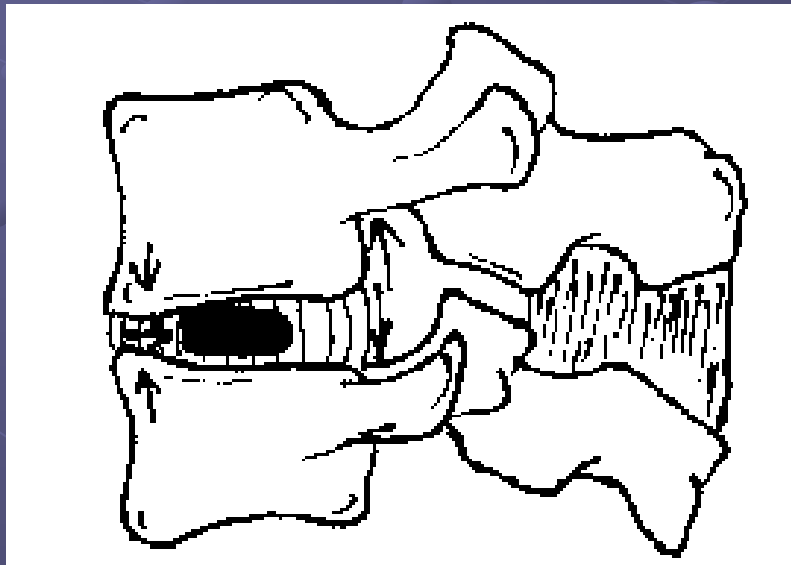
- End range stress of adaptively shortened structures
- Mechanical deformation immediately produces pain at end of range
- May be discogenic, zygapophyseal, ligamentous, muscular, aponeurosis, etc

# Derangement Syndrome



# Derangement Syndrome

- Anatomical disruption and/or displacement of structures
- The structures' increased mechanical deformation immediately or eventually produce pain



# Definition of Terms

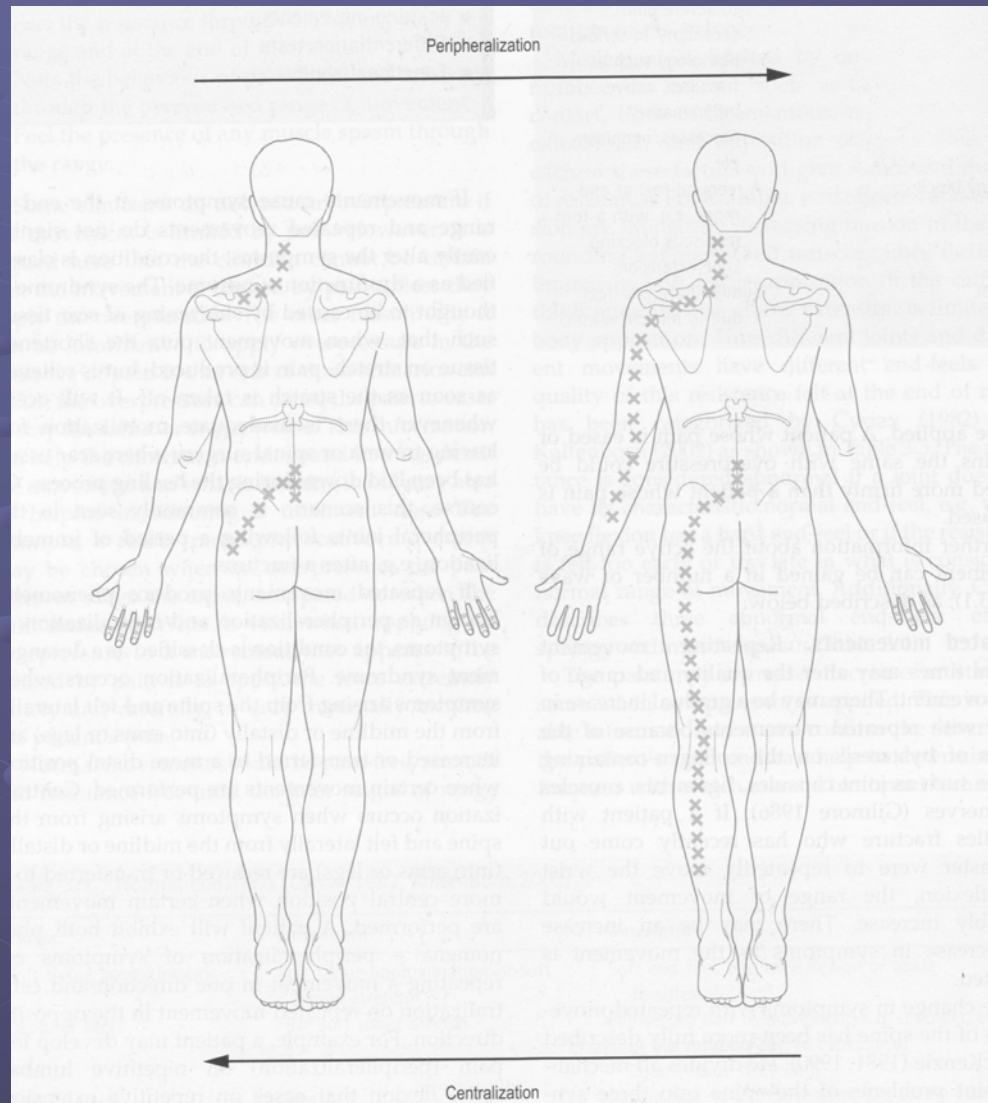
## ● Centralization

- Describes the phenomenon in which limb pain emanating from the spine is progressively abolished in a distal to proximal direction in response to therapeutic loading strategies , with each progressive symptom change being retained over time. If back pain only is present this is reduced and then abolished.

## ● Peripheralization

- Describes the phenomenon by which pain emanating from the spine spreads distally into or further into the limb as a result loading strategies. If pain is produced in the limb, spreads distally or increases distally and remains worse the loading strategy should be avoided.

# Centralization/Peripheralization - cont



# Def'n - cont

- **Lateral shift (right)**

- A lateral shift exists when the vertebra above has laterally flexed to one side in relation to the vertebra below, carrying the trunk with it. (The upper trunk and shoulders are displaced to the right.)

- **Contralateral and ipsilateral shift**

- A contralateral shift exists when the patient's symptoms are on one side and the shift is in the opposite direction. For instance, left back pain, with / without thigh / leg pain, and upper trunk and shoulders displaced to the right.

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# Lateral Shift



# Def'n - cont

## ● **Criteria for Relevant lateral shift (structural vs habitual)**

- Upper body is visibly and unmistakably shifted to one side
- Onset of shift occurred with back pain
- Patient is unable to correct shift voluntarily
- If patient is able to correct shift they cannot maintain correction
- Correction affects intensity of symptoms
- Correction causes centralization or worsening of peripheral symptoms

# Def'n - cont

## ● **Symptomatic responses**

- The changes in the patient symptoms that are elicited and recorded with the application of assessment procedures, treatment procedures or in response to functional activities and positions.

## ● **Mechanical responses**

- The measurable changes that occur in movement loss, dural tension, neurological function, tolerance to functional activities and positions, or change in tested physical abilities.

# Examination terms

- Terms used to determine the response to repeated movements, sustained positions, treatment procedures and/or functional activities and positions on pain patterns in musculoskeletal disorders.
- These are used BEFORE, DURING and AFTER the procedure to accurately evaluate the response.

# During Mechanical Loading

Increase	Symptoms already present are increased in intensity.
Decrease	Symptoms already present are decreased in intensity.
Produce	Movement or loading creates symptoms that were not present prior to the test.
Abolish	Movement or loading abolishes symptoms that were present prior the test.
Centralizing	Movement or loading moves the most distal pain in a proximal direction.
Peripheralizing	Movement or loading moves the pain more distally.
No Effect	Movement or loading has no effect on the symptoms.

# After Mechanical Loading

Worse	Symptoms produced or increased with movement or loading remain aggravated following the test.
Not Worse	Symptoms produced or increased with movement or loading return to baseline after testing.
Better	Symptoms decreased or abolished with movement or loading remain improved after testing.
Not Better	Symptoms decreased or abolished with movement or loading return to baseline after testing.
Centralized	Distal symptoms abolished by movement or loading remain abolished after testing.
Peripheralized	Distal pain produced during movement or loading remain after testing.
No Effect	Movement or loading has no effect on symptoms after testing.

# EVALUATION PROCESS

## ● PATIENT HISTORY– 1\* role is to establish a hypothetical diagnosis

- Location of pain
- Duration of current episode of pain
- Intermittent or Constant pain
- MOI
- Symptomatic and Mechanical responses to:
  - bending, sitting, rising from sitting, turning, lying, rising from lying; upon waking, as the day progresses, in the evening, when still and when on the move
- How many previous episodes and similarities?
- RED FLAGS and possible contraindications to MDT?
- Occupation:



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# PHYSICAL EXAMINATION

- Primary role is to confirm hypothetical diagnosis from patient history along w/ determining appropriate loading strategy
- Posture:
  - Habits
  - Acute spinal deformity – lateral shift, torticollis, etc
  - Other abnormalities: leg length difference, scoliosis, atrophy, etc

# Physical Exam - cont

- Neuro exam as appropriate
- Movement Loss
  - Willingness to move/quality/quantity
  - Baseline for determination of the mechanical response of the test movements/positions
- Repeated Movement
  - Observations are made as to symptom and mechanical response after several repetitions
- Sustained test
  - can be performed if the repeated test movements don't provide adequate information to come to a conclusion
- Other – ie VBI, Hip, SIJ, Shoulder etc clearing tests

# Test Movements – Cervical aka Active Physiological Movements

- Protrusion (Pro) and Repeated (Rep Pro)
- Retraction (Ret) and Repeated (Rep Ret)
- Retraction Extension (Ret Ext) and Repeated (Rep Ret Ext)
- Sidebend (SB) and Repeated (Rep SB)
- Rotation (Rot) and Repeated (Rep Rot)
- Flexion (Flex) and Repeated (Rep Flex)

# Protrusion



# Retraction



# Retraction Extension



# Flexion



# Sidebend



# Rotation

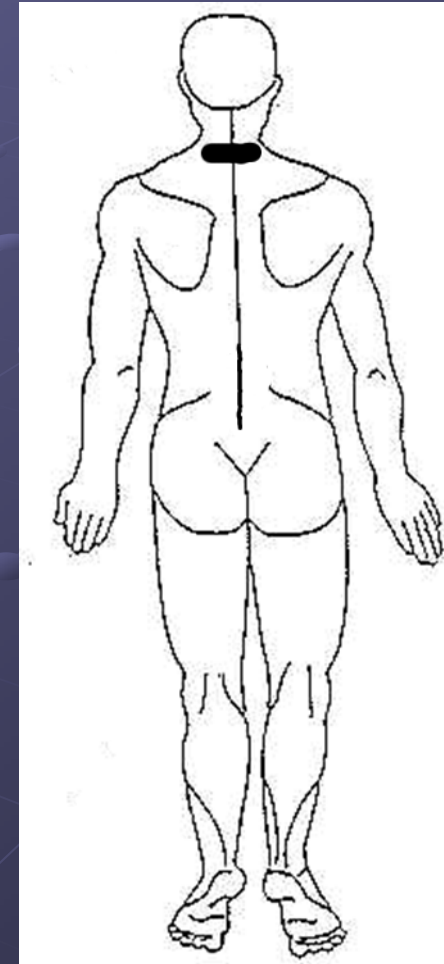


# Derangement Syndromes



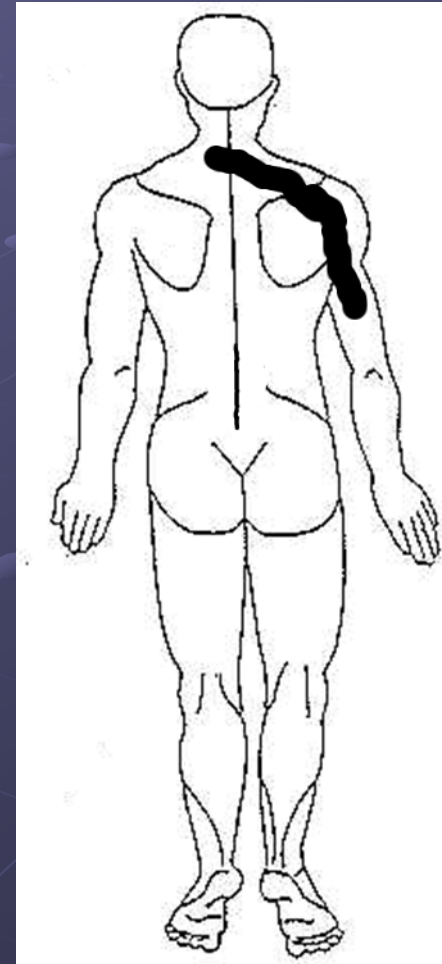
# Derangement Syndromes

Derangement	Clinical Presentation
1	Central or symmetrical pain across C5-7 Rarely Scap or shoulder pain NO DEFORMITY Extension limited Rapidly Reversible
2	Central or symmetrical pain across C5-7 W/ or W/O Scap/Sh or Upper arm pain KYPHOTIC DEFOMITY Rarely Rapidly reversible



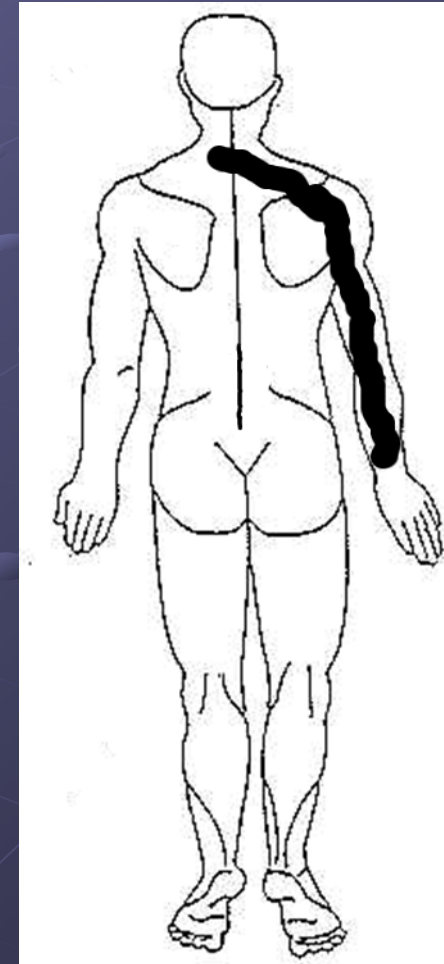
# Derangement Syndromes

Derangement	Clinical Presentation
3	Unilat or Asymmetrical pain across C5-7 w/ or w/o Scap/Sh or Upper arm pain NO DEFORMITY Ext, Rot and later flex or combo limited Rapidly reversible
4	Unilat or Asymmetrical pain across C5-7 w/ or w/o Scap/Sh or Upper arm pain Relavent LATERAL SHIFT or Torticollis Ext, Rot and later flex limited



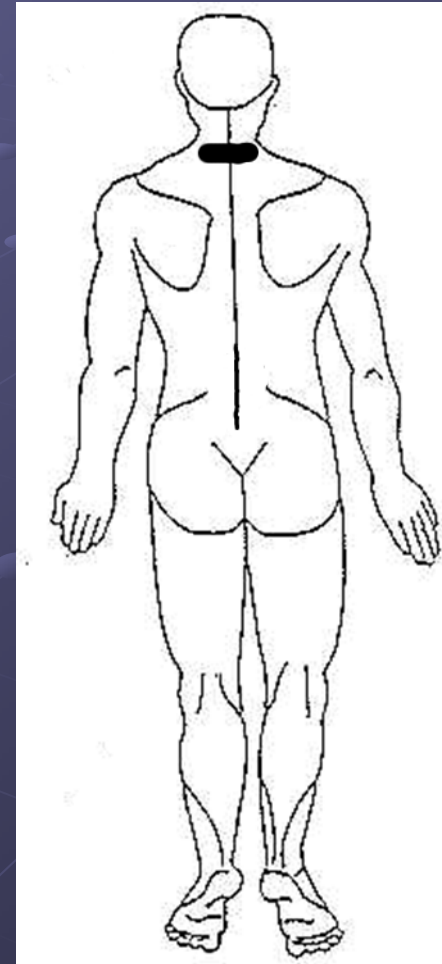
# Derangement Syndromes

Derangement	Clinical Presentation
5	Unilat or Asymmetrical pain across C5-7 w/ or w/o Scap/Sh or Upper arm pain AND w/ arm sx distal to elbow W/ Leg pain extending below knee NO DEFORMITY Ext, ipsilateral lat flex limited Rapidly Reversible
6	Unilat or Asymmetrical pain across L4/5 w/ or w/o Scap/Sh or Upper arm pain AND w/ arm sx distal to elbow Relavent LATERAL SHIFT- Csp Kyphosis or Torticollis Not rapidly reversible



# Derangement Syndromes

Derangement	Clinical Presentation
7	Unilat or Asymmetrical pain across C5-7 w/ or w/o Ant/Ant-lat neck pain No deformity Flex limited Rapidly reversible



	Posture	Dysfunction	Derangement
Age	Younger		20-40
Pathology	None	Adaptively shortened tissue	Yes
Pain Location	Local	Local (except ANR)	Local or remote
Pain Referred	None	None (except ANR)	Possible
Deformity	None	None (exceptions)	Possible
ROM Loss	None	Yes	Yes
Rep Test Mvt: PDM	None	None (except ANR)	Possible
Rep Test Mvt: ERP	None	Yes	Yes
Rep Test Mvt: Effects	NE	P, ERP, NW	P/A, B/W, Incr/Decr, NB/NW, Cent/Peri
Definition	Normal tissue/ Abnormal stress	Adaptively shortened tissue/ normal stress	Rapid change w/ mvt Mechanical displacmnt of motion segment
Treatment	Posture Correction Posture Ed Prophalaxis	Remodel: Rep mvt TOWARD direction of restriction Prophalaxis	Reduce Maintain Remodel Prophylaxis

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