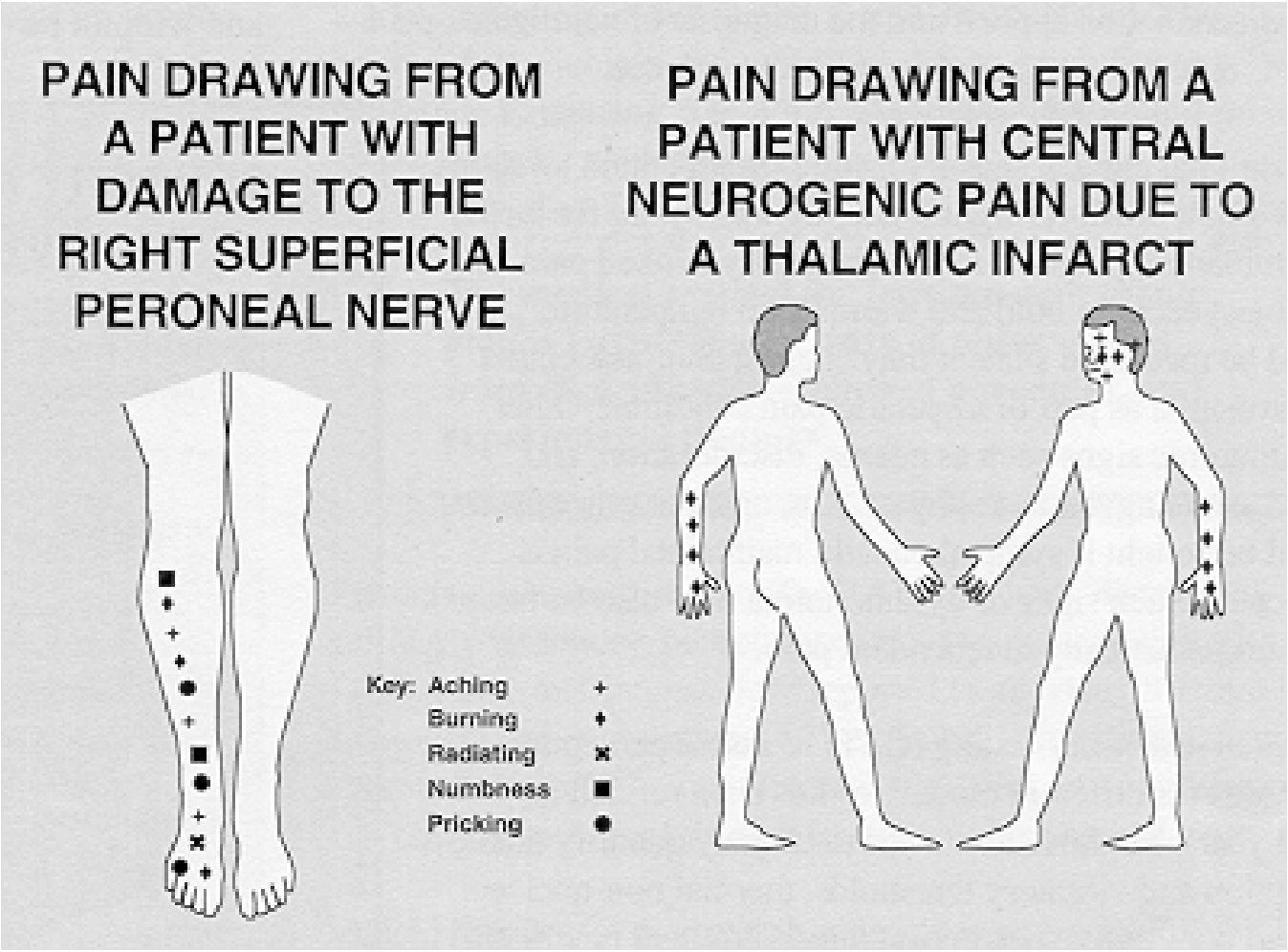
Intake /Outcomes Instruments (II)

- Pain body diagram
- Changes in distribution can signify improvement or worsening even with unchanged intensity
- May indicate abnormal pain behavior
  - Symmetric, artistic patterns unrelated to anatomical patterns
  - Outside body silhoutette
  - Writing text

Normal pain drawing



Intake /Outcomes Instruments (III)

- Disability / Functional Measures
  - Oswestry
    - 10 sections, each scored 0-5
    - Multiply by 2 to get score
    - Interpretation:
      - 0-20%: minimal
      - 20-40%: moderate
      - 40-50%: severe
      - 60-80%:crippled
      - 80-100%: bedbound or exaggerating

Intake / Outcomes Instruments (III)

- Disability / Functional Measures
  - Roland-Morris
    - Several versions (24, 20, 18 items)
    - Each item worth one point

Risk factors for low back pathology / pain (I)

- Genetic
  - Cartilage collagens (collagens II, IX and XI) found in hyaline cartilage and intervertebral disc.
  - mutations in the quantitatively major cartilage protein, collagen II, result diseases ranging from chondrodysplasias to osteoarthritis.
  - Collagen XI mutations not usually severe
  - Defect in any of the 3 collagen IX genes ((found in discs) may lead to disc disease

Risk factors for low back pathology / pain (II)

- Biomechanical
  - Lumbar shear loading
  - Cumulative disc compression
  - Flexion, rotation, lifting
    - 60^0 flexion > 5% time
    - 30^0 rotation > 10% working time
    - 25 kg lifted > 15 times/day
  - Whole body vibration
    - Disc softening
  - Weakness of trunk extensors, maybe flexors
  - Hypertonus of HS and quad (adolescents)

Risk factors for low back pathology / pain (III)

- Psychosocial
  - Lower job satisfaction
  - Lower workplace social environment score
  - Higher perceived exertion at work

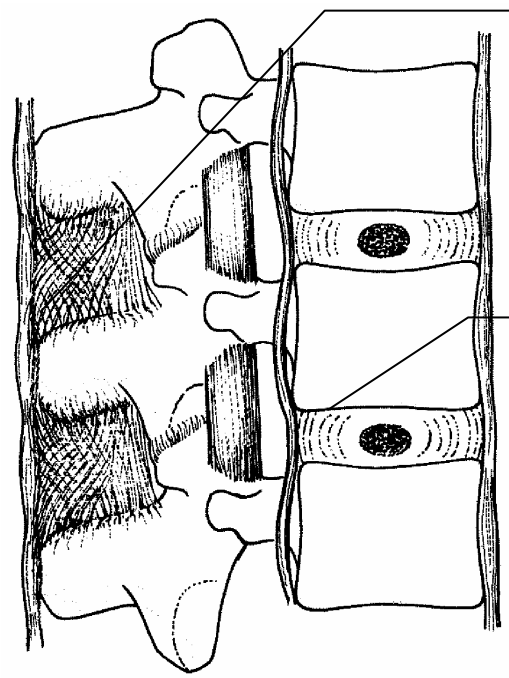
Risk factors for low back pathology / pain (IV)

- Vascular
  - Inactivity results in decreased perfusion of spinal tissue (expression, imbibition)
  - Smoking, HT, hypercholesterolemia → atherosclerosis of LB vessels
  - Nicotine → disc djd, perhaps by → proteolytic activity

Pain generators

- Bogduk criteria
  - Tissue has nociceptive innervation
  - Pain provocation normal subjects (hypertonic saline)
  - Pain elimination in symptomatic subjects (anesthetic injection)
  - Examples:
    - Interspinous, supraspinous ligaments
    - Outer annulus and/or PLL
    - SI joint
    - Facet joint

Verified pain generators



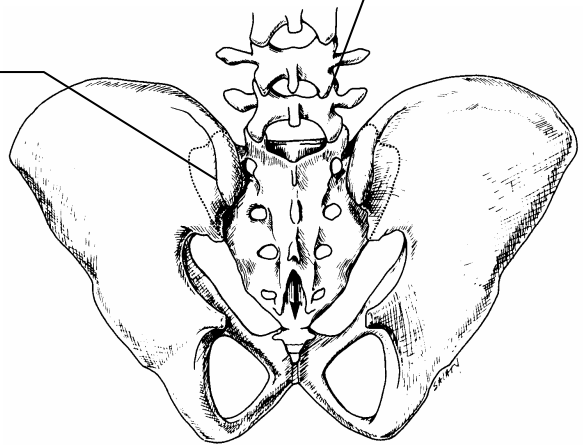
Interspinous and/or supraspinous* ligament

**The anatomic distinction between the lumbar supraspinous ligament and muscular tendinous insertions is controversial*

Outer annulus and/or posterior longitudinal ligament

Facet joint

Sacroiliac joint



Lumbopelvic pain generators (Bogduk)

- Discs: 39%
- Facet joints: 15-40%
- SI: 13%
- Muscles: probably not
  - not much evidence, neither EMG nor TP related
- Ligaments: no
  - No supraspinous below L3
  - Above L3 = erector spinae /
  - latissimus

Bogduk N. The anatomical basis for spinal pain syndromes. JMPT 1995;18(9):603-5.

Red flags (I)

- Serious pathology presenting as LBP
  - Fracture
    - Major trauma
    - Minor trauma w/osteopenia

Diagnostic radiology

- Unsuspected positive findings in 20-50 year old patients:
  - 1 in 2500
    - Phillips RB. Plain film radiology in chiropractic. JMPT 1992;15(1):47-50.
  - “Spinal radiographs . . . have minimal value in predicting the presence or absence of low back complaints . . .
    - Phillips et al, Low back pain: a radiographic enigma. JMPT 1986;9(3):183-7.
  - Bone tumor incidence 1/500,000
    - Fisk, 1977

- Stopped here adding new question to test bank

General guidelines for x-ray examination. Selected clinical indications for initial x-ray examination

- Routine radiography should not be performed without regard for clinical need
- Advertisement for free x-rays shall accompany the statement that, to avoid needless health hazards associated with ionizing radiation, no such free x-ray will be given unless there is a prior observable clinical need
- Avoidance of split screen radiographic techniques or other mechanisms which compensate for tissue thickness by altering the screens or their light emission is recommended
- Repeat radiographic evaluation should not be undertaken without significant clinical indication
- Pregnant females should not be radiographed unless symptoms suggest that proper treatment might jeopardize the patient without the use of such radiographs
- Use compensating filters and gonad shielding, except where such gonad shielding would exclude an area which is clinically necessary to examine
- Females with reproductive potential, or where the possibility of pregnancy exist should only be radiographed if clinically necessary, and preferably during the first ten days following the onset of menses
  - .Trauma
  - .Unexplained weight loss of 4.5Kg or more over preceding 6 months
  - .Unrelenting pain at rest
  - .Evolving neurological deficit suggestive of intervertebral disc pathology, stenosis or tumor
  - .History of cancer, corticosteroid use, IV drug use, use of blood thinners and known endocrine disease
  - .Pinpoint bony tenderness of the spinous process
  - .Painless loss of joint play indicating a transitional segment, block vertebra or spinal fusion
  - .Step defect suggestive of spondylolisthesis
  - .Significant scoliosis as observed on physical exam
  - .Patient over age of 50
  - .Suspected spinal instability
-

Red flags (II)

- Serious pathology presenting as LBP
  - Tumor or infection
    - Constitutional symptoms
    - Pain worse at night
    - Age > 50, <20
    - History cancer
    - Vectors of infection
      - Recent bacterial infections
      - IV drug use/abuse
      - Recent surgery
      - Immunodeficiency

Red flags (III)

- Serious pathology presenting as LBP
  - Cauda equina syndrome
    - Saddle anesthesia
    - Recent bladder/bowel dysfunction
    - Severe or progressive neurological deficits

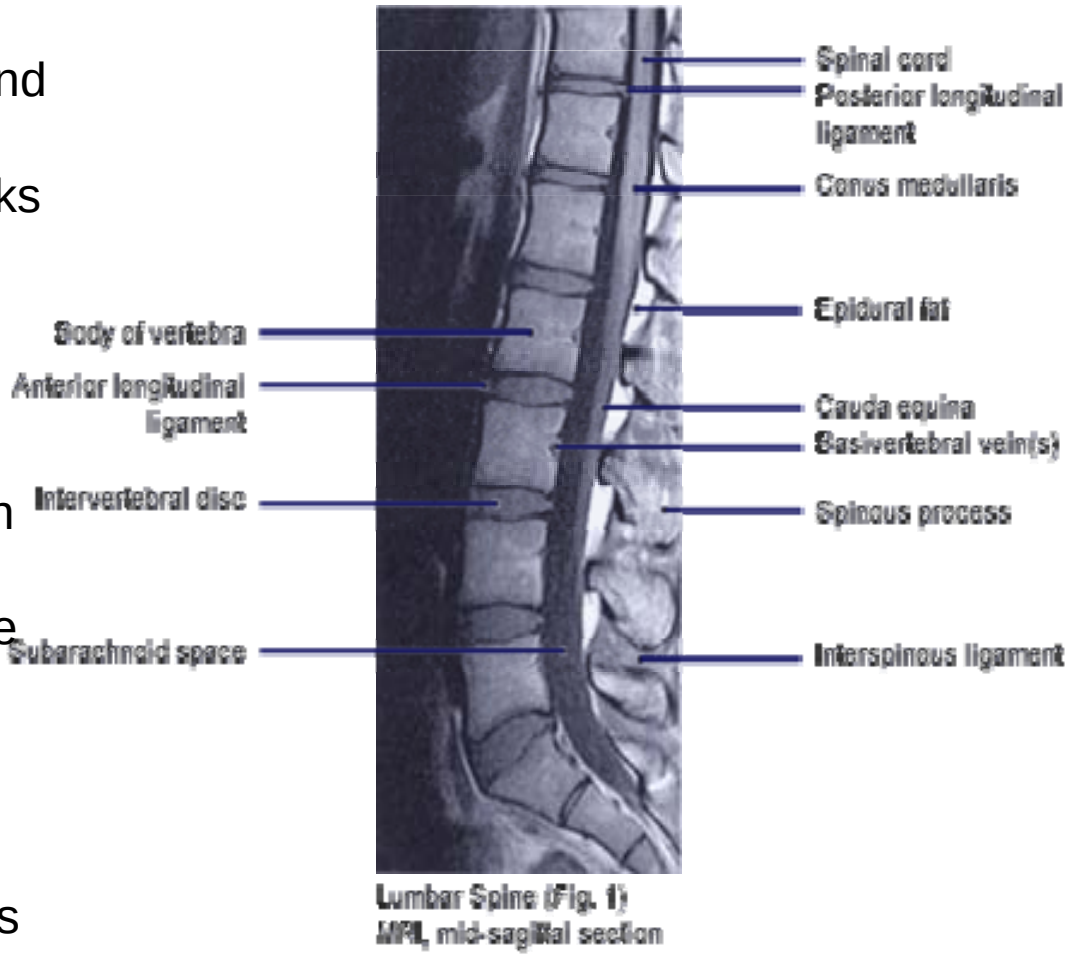
Cauda equina syndrome

numbness, loss of sensation and pain in the legs, buttocks and pelvic region to varying degrees.

Constipation and/or fecal incontinence

Urine retention

Sexual disturbances

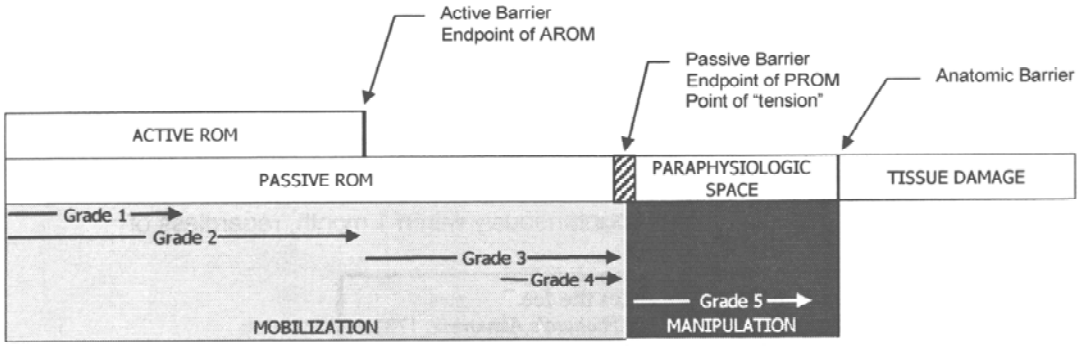


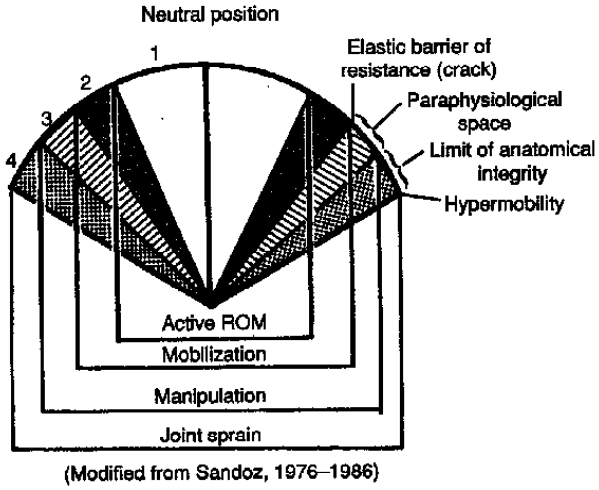
Consensus guidelines

- AHCPR
- Mercy
- ICA Guidelines
- Glenerin
- Wyndham
- Council on Chiropractic Practice
- Etc.

Adjustment, manipulation, mobilization

- Tradition, common usage approach
- Biomechanical definition





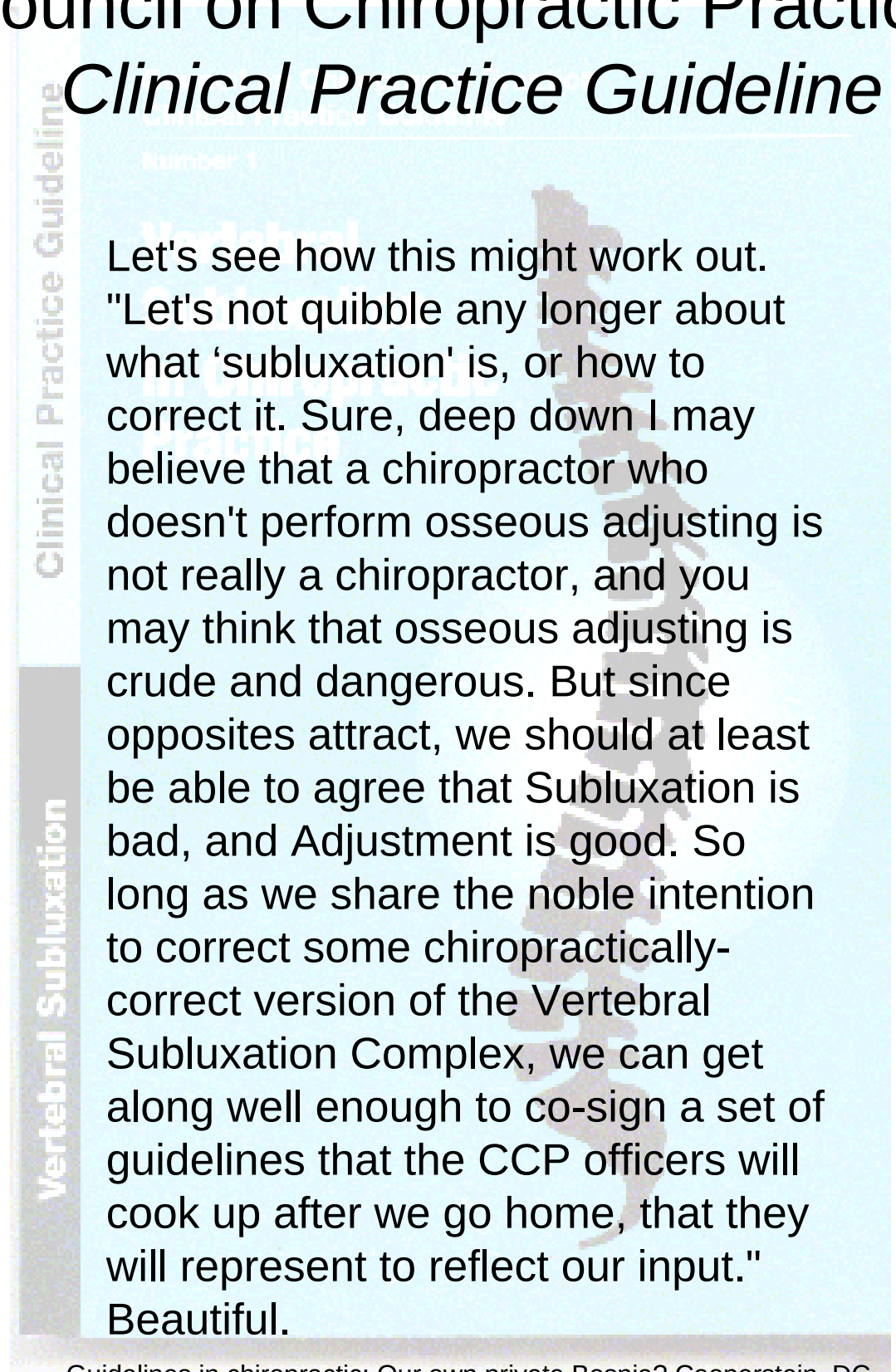
After Sandoz R. Some physical mechanisms and effects of spinal adjustments. Annals of the Swiss Chiropractic Association 1976;6:91-141.

Mercy Guidelines: TOC

Mercy Guidelines recommendations

- If no red flags or contraindications, initial trial use of “spinal manipulative therapy” for 10-14 days at frequency of 3-5 times/week
- If ineffective, a second 2 week trial with a significantly different treatment plan
- Complicating factors may extend recovery time:
  - History of >4 previous episodes: up to 2 times longer
  - Symptoms lasting >8 days prior to consult: 1.5 times longer
  - Severe pain: up to 2 times longer
- Pre-existing structural pathology/anomaly: 1.5 to 2 times longer

Council on Chiropractic Practice: *Clinical Practice Guideline*



Let's see how this might work out. "Let's not quibble any longer about what ‘subluxation' is, or how to correct it. Sure, deep down I may believe that a chiropractor who doesn't perform osseous adjusting is not really a chiropractor, and you may think that osseous adjusting is crude and dangerous. But since opposites attract, we should at least be able to agree that Subluxation is bad, and Adjustment is good. So long as we share the noble intention to correct some chiropractically-correct version of the Vertebral Subluxation Complex, we can get along well enough to co-sign a set of guidelines that the CCP officers will cook up after we go home, that they will represent to reflect our input." Beautiful.

Guidelines in chiropractic: Our own private Bosnia? Cooperstein, DC

Mercy>ICA>CCP

Abstract

Objective To evaluate the quality of *Recommended Clinical Protocols and Guidelines for the Practice of Chiropractic* (ICA guidelines) published by the International Chiropractors Association (ICA), August, 2000.

Methods The Appraisal Instrument for Clinical Guidelines (Cluzeau instrument) was applied to the ICA guidelines by 10 independent experienced evaluators. An independent, global assessment was also made by each evaluator.

Results Mean scores (with 95% confidence limit) for each of the instrument's 3 dimensions were Rigor of Development, 27% (5.1); Context and Content, 18.3% (9.4); and Application, 2% (3.9). The unanimous global assessment was "not recommended as suitable for utilization in practice." Comparison of the ICA guideline scores with the Council on Chiropractic Practice's *Clinical Practice Guideline No. 1, Vertebral Subluxation in Chiropractic Practice* (CCP guidelines) scores and *Guidelines for Chiropractic Quality Assurance and Practice Parameters* (Mercy guidelines) Cluzeau instrument-based scores revealed that the ICA guidelines received slightly higher scores than the CCP guidelines but substantially lower scores than the Mercy guidelines for all dimensions.

Conclusion The ICA guidelines were assessed as not suitable for utilization in chiropractic practice.

AHCPR

- Recommended Methods:
  - Nonprescription analgesics
    - Acetaminophen (safest)
    - NSAIDs (aspirin, ibuprofen)
  - Prescribed pharmaceutical methods for nonspecific low back symptoms and/or sciatica
    - Other NSAIDs
  - Prescribed physical methods for nonspecific low back symptoms
    - Manipulation (in place of medication or a shorter trial if combined with NSAIDs)

http://hstat.nlm.nih.gov/hq/Hquest/db/local.arahcpr.arclin.lbpc/screen/TocDisplay/s/39663/action/Toc

Yellow flags for chronicity

- Psychosocial risk of chronicity and/or work loss
- History, intake instrument findings
  - Radiating leg pain
  - Severe pain intensity
  - Symptoms>8days prior to consult
  - Previous history of LBP
- Physical exam, imaging findings
  - Reduced SLR
  - Signs nerve root involvement
  - Pre-existing structural pathology/anomaly
  - Reduced trunk strength
  - Poor fitness, aerobic capacity
  - Waddell's signs

- Other factors
  - Smoking
  - Personal problems: ethanol, marital, financial
  - Total work loss in last 12 months
  - Heavy phys activity in occupation
  - Low job satisfaction
  - Litigation status
  - Lower educational status

Waddell signs

- Presence of 3 or more correlated with disability
  - Superficial or non-anatomic tenderness (skin tender to light pinch over wide area)
  - Positive simulation tests
  - Positive distraction tests
  - Regional disturbances: motor or sensory
  - Over-reaction: guarding, grimacing, bracing, rubbing, sighing
- Sensitivity
  - Men 44%, Women 48% (the proportion of positive results obtained among those who truly have the disease)
- Specificity
  - Men 86%, Women 84% (the proportion of negative results obtained among those who are truly free of the disease)
- Reliability
  - Interrater reliability was found to be 86%

Waddell signs (2)

Signs suggestive of nonorganic back pain

- In 1980, Waddell and colleagues reported the results of their prospective study of 26 clinical signs in 350 patient evaluations.
- They identified eight behavioral signs that are consistently reliable and reproducible for identifying nonstructural problems in patients with back pain

Sign	Description
Superficial tenderness	• Skin discomfort on light palpation. • Physical back pain does not make the skin tender to light touch.
Nonanatomic tenderness	• Tenderness that crosses multiple somatic boundaries • Any pain or tenderness that crosses anatomic lines without a reasonable explanation is considered positive.
Axial loading	• Pressing down on the top of the head of a standing patient. • This maneuver should not produce low back pain.
Simulated rotation	• In a standing position, when the shoulders and pelvis are rotated in unison, the structures in the back are not stressed.
Distracted straight-leg raise	• Patient may complain of pain or limitation in range in a supine straight leg raising test. • Lack of pain when examiner extends the knee with the patient seated, and looking at the foot for pulses, Babinski or reflex testing.
Regional sensory change	• "Stocking" or global distribution of numbness • Any widespread numbness that involves an entire extremity or side of the body.
Regional weakness	• In patients with normal strength, the sudden letting go of a muscle may be described as "cogwheeling," "giving way," "breakaway" weakness, or "dithering." • In patients with physical weakness, the muscle is smoothly overpowered with no jerking, and the response throughout a resisted range-of-motion maneuver remains smooth and constant. • This smooth weakness is nearly impossible for a patient with nonorganic weakness to duplicate.
Overreaction	• Exaggerated, nonreproducible response to stimulus • A patient may be hypersensitive to light touch at one point during examination but later give no response to touching of the same area. • A disproportionate grimace, tremor, exaggerated verbalizations, sweating, or collapse.

- The predictive value is greatly improved when three or more positive signs are present.
- some patients with physical back problems may have one or two Waddell signs. Anxiety, fear, and the desire to please the physician can cause patients to exhibit one or more of these signs.

Examples of Waddell signs

Axial pressure while standing

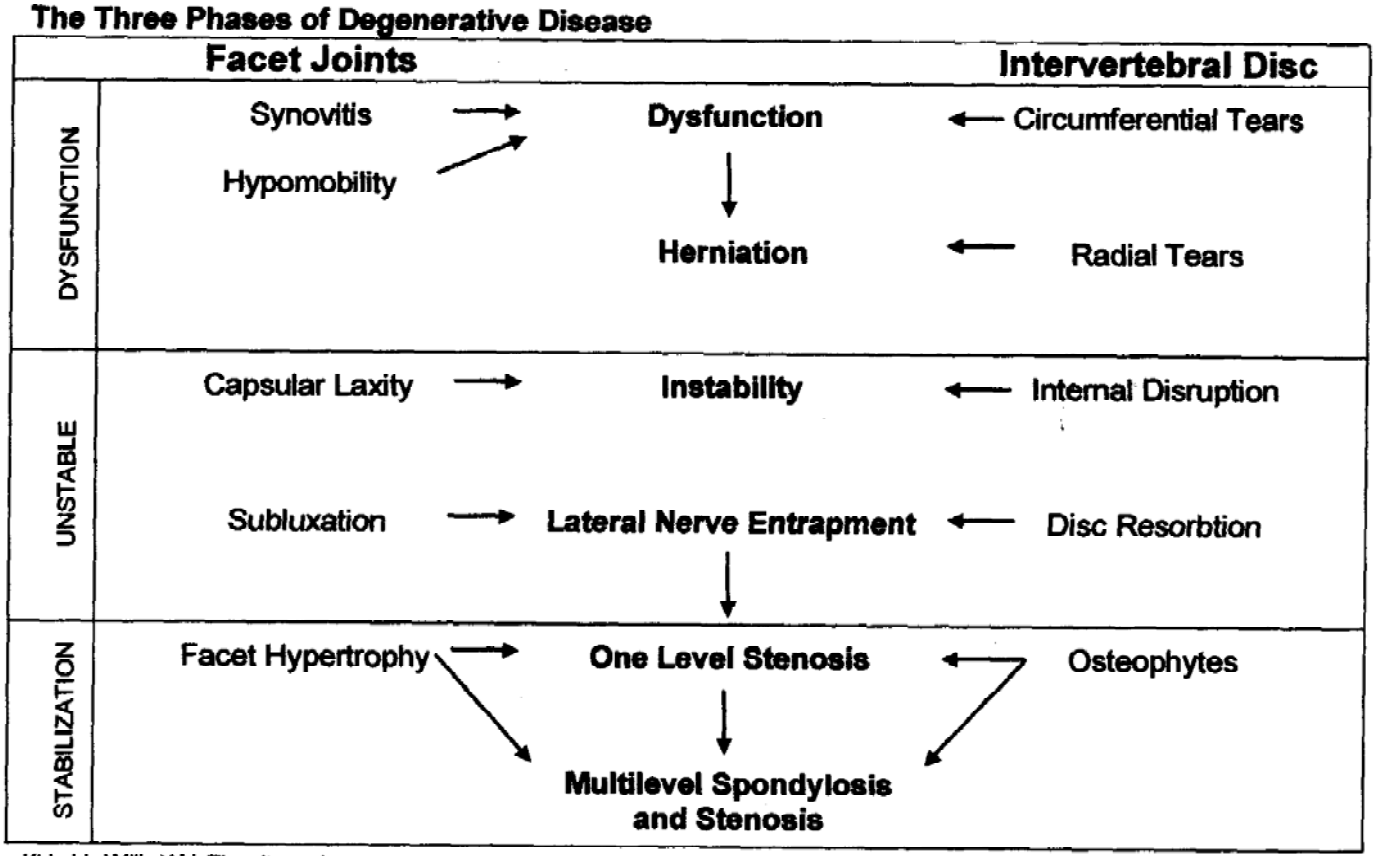
Simulates SLR

Pathological models

- Degenerative pathology
  - Kirkaldy-Willis model
- Mechanical
  - McKenzie model
- Functional pathology
  - Janda, Lewit model

Kirkaldy-Willis Model

- Based on Farfan's "3 joint complex" – 2 facet joints and the disc



Kirkaldy-Willis WH. The site and nature of the lesion. In: Kirkaldy-Willis WH, Burton CV, editors. Managing Low Back Pain. Third ed. New York: Churchill Livingstone; 1992.

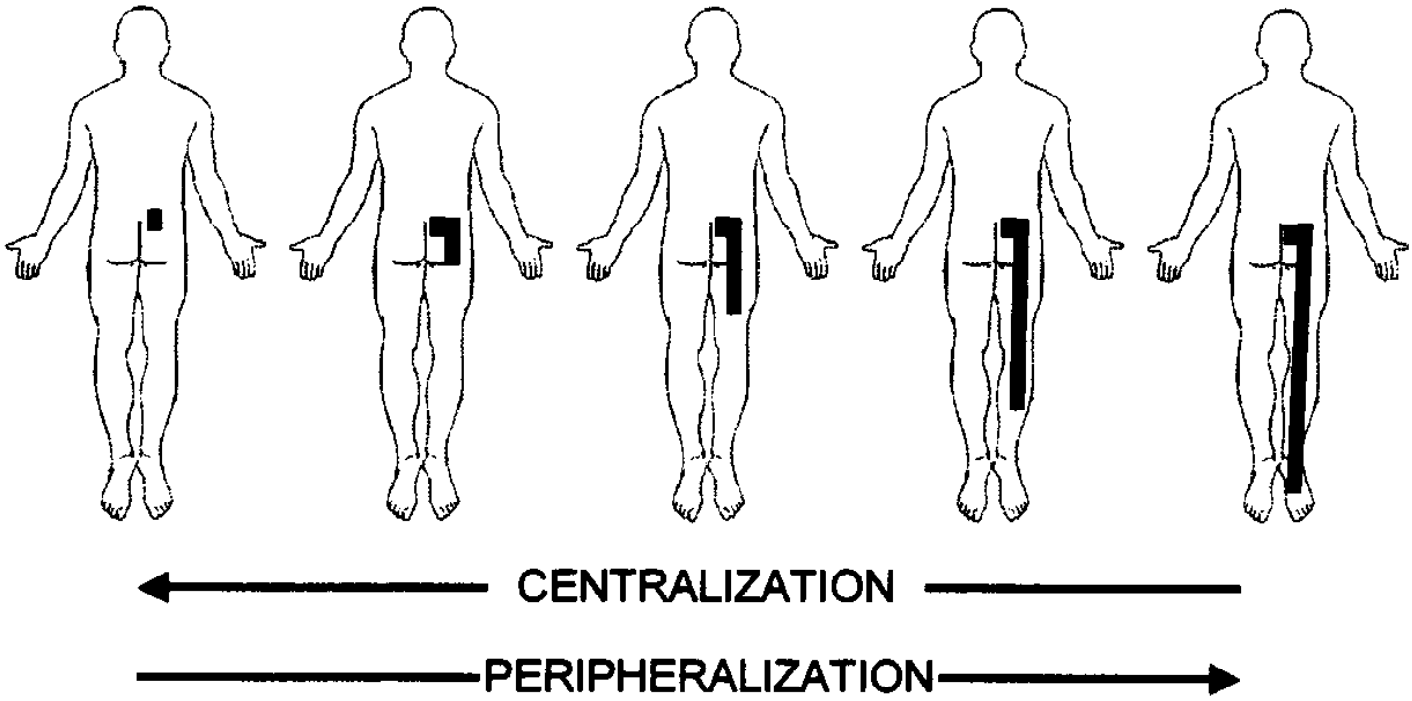
Kirkaldy-Willis stages

- Dysfunction
  - Sprain/strain of facet joints → synovitis, hypomobility
  - Disc circumferential and radial tears
  - Tx: SMT, TP
- Unstable phase
  - Capsular laxity →subluxation of post joints, SI; lateral canal stenosis, HNP, poss. radiculopathy
  - Int Disc Disruption (IDD), deg spondy
  - Tx: stabilization -- surgical or conservative myofascial, etc.
- Stabilization
  - Facet hypertrophy
  - Central canal stenosis, deg disc dx (DDD)
  - Tx: surgical decompression, conservative myofascial, etc.

McKenzie Model

- Assessment and treatment based on patient responses to end-range loading (singular sustained or repetitive)
- Based on evoked responses, not palpatory findings
- Pain and/or paresthesia is
  - Increased or decreased
  - Centralized or peripheralized
- Range of motion lost due to
  - Pain and/or fear
  - Mechanical impedance
    - Shortened tissue (premature)
    - Obstruction (blockage)

Centralization and Peripheralization



McKenzie syndromes

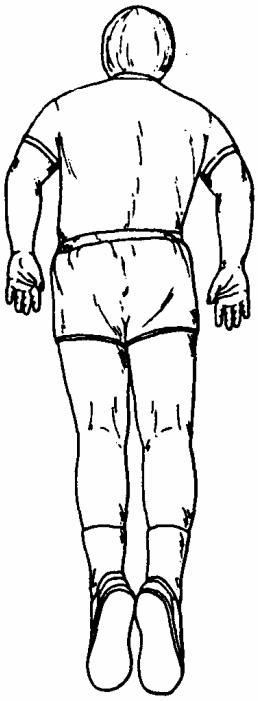
- Postural syndrome
  - No ROM loss
  - No pain w/ repetitive motion
- (Facet) Dysfunction syndrome
  - ROM loss at end range
  - Local pain w/ repetitive motion
  - Stretching indicated, even w/pain
- (Disc) Derangement syndrome
  - Kinesalgia and ROM loss at end range
    - w/centralization
      - Competent annulus
      - Manual treatment OK
      - Good prognosis
    - w/peripheralization
      - Incompetent annulus
      - Poor prognosis
      - Possible disc extrusion needing surgery

McKenzie exercises

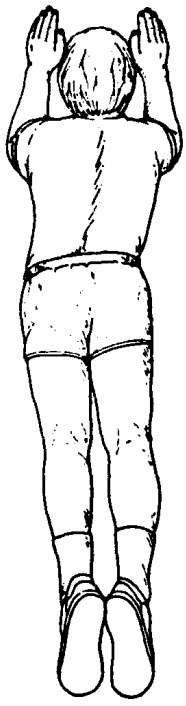
Lateral movement with extension
The patient lies face down, with his arms at his sides (A). He then moves his hips away from the side of pain (this exercise is for patients with unilateral symptoms) and maintains this position for a few seconds (B). With the hips off center, the patient then places his elbows under his shoulders and leans on his forearms (C and D); he relaxes in this position for three or four minutes. The patient can then perform the maneuver "extension while lying prone" while keeping his hips off center.

A

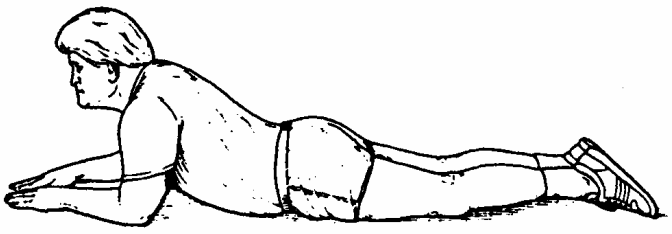
B



C



D



Provocation testing

- Attempts to guide interventions based on patient responses to clinical provocations
- Mostly straightforward, but mild to moderate increase local pain equivocal

Provocation Testing

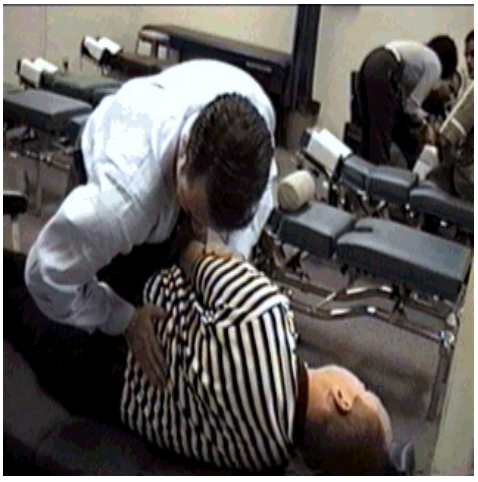
	Response	Vector (direction) of Adjustment	Comments
Local Symptoms	Any ↓ local pain	Indicated	This also applies to patient guarding or apprehension.
	Mild to moderate ↑ local pain	Equivocal	
	Severe ↑ local pain	Contraindicated	
Referred Symptoms	Centralization of pain and/or paresthesia	Indicated	Vector is appropriate but loading (i.e. amount of force, speed, repetitions) must vary according to patient tolerance.
	Peripheralization of pain and/or paresthesia	Contraindicated	
New Symptoms	Creation of neurologic signs and/or symptoms	Contraindicated	This also applies to VBAI.

Sagittal plane considerations in lumbar side-posture manipulation

- Segmental thrusts have regional implications
- Thrusting may extend, flex, or leave the spine posturally neutral

Body neutral

In flexion



In extension

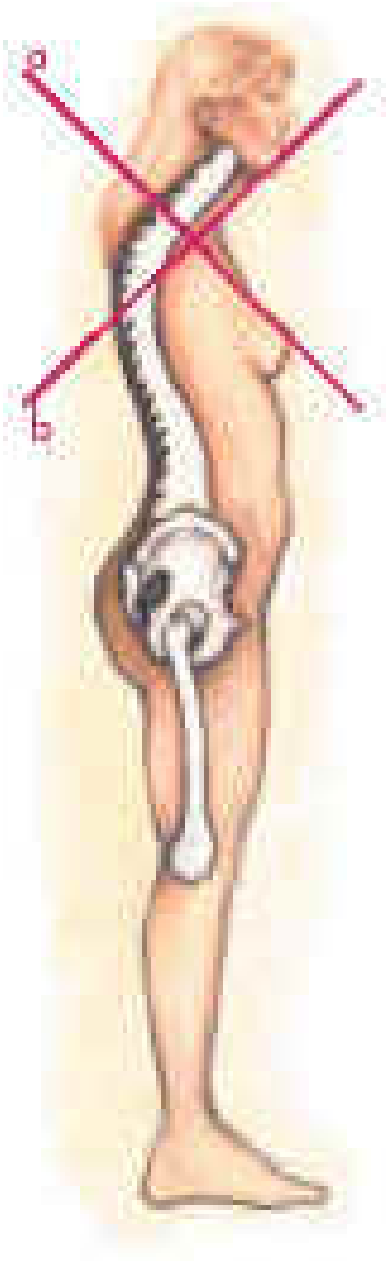
Vladimir Janda

Separated at birth?

Janda / Lewit Model: functional pathology

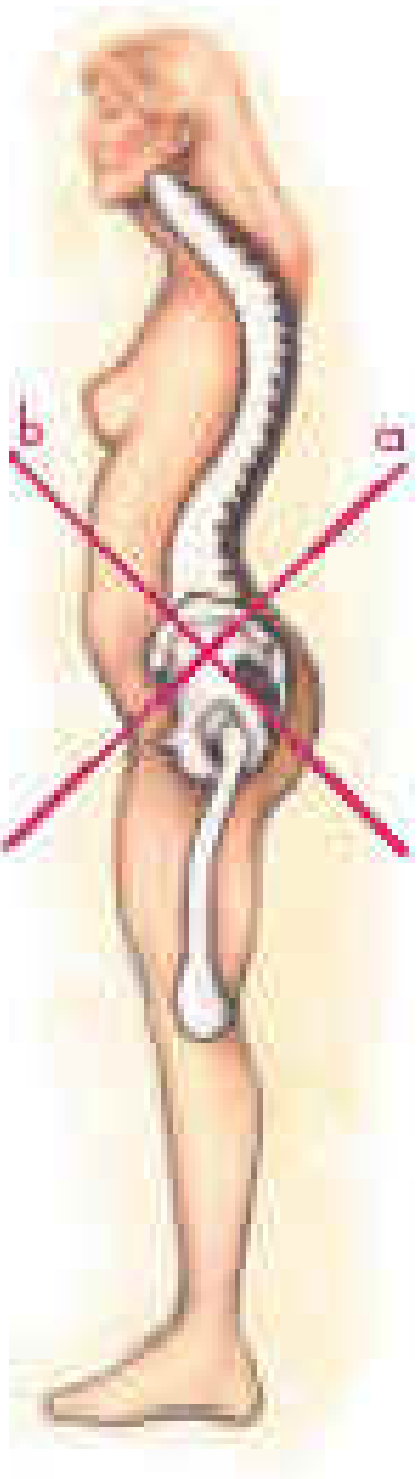
- Reliable in chronic situations only
- Locomotor pathology and ***muscle imbalance*** assessed in:
  - Gait
  - Posture
  - Muscle length
  - Movement patterns
- Muscle imbalance
  - Some muscles tight/short
  - Some muscles weak/inhibited

Upper crossed syndrome



Tight line (a) passes through the levator scapulae, upper trapezius and the pectorals, causing shoulder elevation and scapular protraction. Inhibition in the deep neck flexors and lower shoulder stabilizers (b) permits this asymmetry.

Lower crossed syndrome



tight line (a) travels through the iliopsoas and lumbar erectors, which pull and hold this aberrant swayback posture. Reciprocal inhibition weakens the abdominals and gluteals (b) allowing this dysfunctional pattern to develop.

Psoas insufficiency syndrome

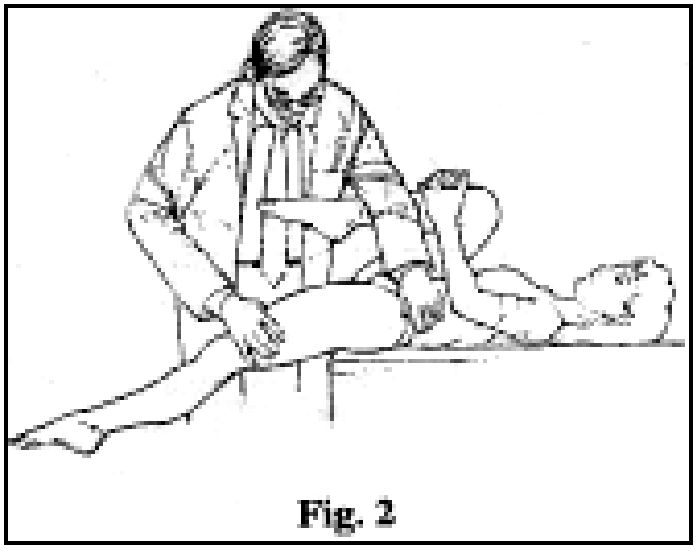


Fig. 2

Chronic psoas shortening and weakness may occur due to sleeping in the fetal position, exercise programs emphasizing repetitive hip flexion, and sedentary life styles.

20 to 30 seconds for 10 to 20 reps as often as possible during the day (left leg is being stretched)

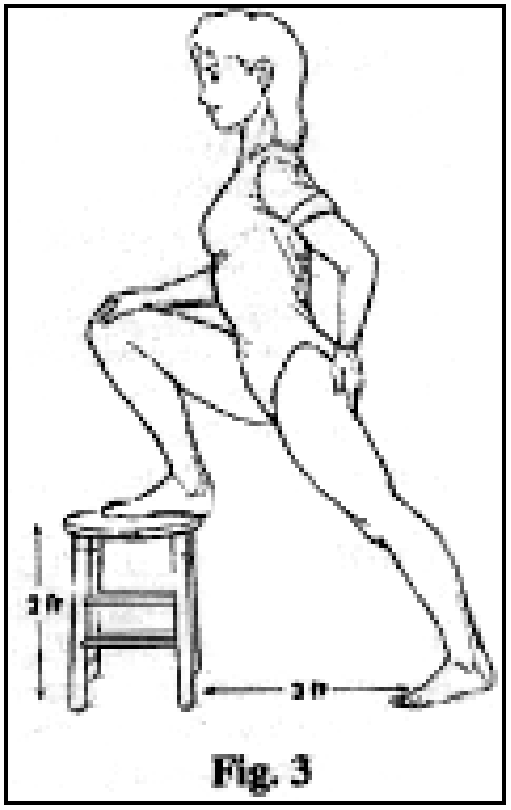


Fig. 3

Phasic and tonic (postural) muscles

POSTURAL MUSCLE CHARACTERISTICS	PHASIC MUSCLE CHARACTERISTICS
Are anti-gravity or tonic muscles; they have a higher resting tonus than phasic muscles	Are available on demand but do not oppose gravity
Tend toward shortness and tightness	Tend toward inhibition and weakness
Are genetically older and less reactive to injury	Are genetically younger and more reactive to injury
Atrophy less quickly than phasic muscles	Atrophy more quickly than postural muscles

Muscle patterns

- **Prone to tightness**
  - Iliopsoas
  - Rectus femoris
  - Thigh adductors
  - Erector spinae
  - Quad lumb
  - Gastroc/soleus
  - Hamstrings
  - TFL
  - Piriformis
  - Pec maj/min
  - Upper trap
  - Lev scap
  - SCM
  - suboccipitals
- Prone to weakness
  - Gluteals (esp max)
  - Abdominals
  - Tib anterior
  - Vastus muscles
  - Middle and lower trap
  - Serr anterior
  - Rhomboids
  - Deep neck flexors

Janda case in point: hip extension dysfunctional pattern

- When a prone patient extends hip, normal sequence of firing is:
  - Glut max, HS, contralateral LS erectors, ipsilateral LS erectors
  - Common deviation: erec spinae before glut max
  - Treatment possibilities
    - Facilitate/strengthen glut max
    - Stretch/relax flexors, erect spin, HS
    - Mobilizie/manipulate hip, LS joint, thoracolumbar spine

Janda treatment implications

- Relax and/or stretch tight muscles, and before beginning exercises for inhibited muscles
- Facilitate and/or strengthen inhibited muscles after stretching tight muscles
- Articulations: manipulate and/or mobilize joint dysfunction, and before muscle stretching
- See Lisi, JACA, for comments on ordering of manipulation and stretching

Stretch or manipulate first?

- . . . Most DCs seem to be in the "stretch-first, adjust-second" camp. Typically, their rationale is that loosening tight muscles in the region of joint restriction will result in a more comfortable, successful, and easily administered adjustment. The muscle stretching is considered a preparatory procedure for the primary intervention, the adjustment. Unfortunately, situations exist where joint hypomobility and/or pain can interfere with the performance of muscle stretching, as will be seen below. It also seems unwise to make treatment rules based primarily on the tradition of considering the adjustment more important than the stretching.

  A growing contrasting opinion comes from the manual medicine field. Lewit and Janda have advocated manipulating joints first and stretching muscles second.2,4 This opinion is based on the muscular inhibition effect demonstrated by spinal manipulation. A number of studies have shown that manipulation results in a decrease in myoelectric activity.5-9 It is theorized, therefore, that stretching muscles after manipulation will result in a more successful stretch.

  Nevertheless, the clinician must still make a decision to determine order of application. Since tradition and neurologic responses are not yet validated, one suggestion is to rely on reproduction of patient symptoms, rather than on a predetermined rule . . .

  The concept of pain response guiding treatment decisions may seem entirely pedestrian to many doctors of chiropractic; however, it has been demonstrated to be a valuable principle.

Muscle energy techniques in chiropractic practice
JACA, Oct 2002 by Lisi, Anthony J

Passive vs. Active care

- Passive care
  - Ice, massage, manipulation
  - Typically used acute situations
  - Does it → provider dependence?
- Active care
  - Exercise, patient-assisted manevers
    - Typically used chronic situations
    - Has received new emphasis
    - Can be low tech
  - Does active care lower income? Is it contrary to chiro philosophy?

Passive care: Objections and options

- Decrease Pain
  - Mobilization, manipulation
  - Massage / myofascial release TP therapy
  - PT Modalities
    - Electric muscle stimulation (± iontophoresis)
    - Ultrasound (±iontophoresis)
    - TENS
    - Ice/heat
  - NSAIDs / Acetaminophen / alternatives
- Decrease Inflammation
  - Manual techniques
  - PRICE - Protection, Rest, Ice, ompression, and Elevation
  - PT Modalities:
    - Electric muscle stimulation (± ontophoresis)
    - Pulsed ultrasound (± phonophoresis)
  - NSAIDs / alternatives
- Stabilize Hypermobile Regions
  - Orthoses (supports or braces)
  - Proprioceptive taping / supports
- Mobilize Hypomobile Regions
  - JOINTS
    - Mobilization: manual; flexion/distraction; blocks; instrument
    - Manipulation: HVLA; LVLA
  - SOFT TISSUE
  - Manual Resistance Techniques
    - PNF,
    - Muscle Energy Techniques: Strain-Counterstrain
  - Postisometric Relaxation
  - Postfacilitation Stretch
- Spray / Stretch
- Massage I Myofascial Release Technlques
  - lschemic Compression, Cross Fiber Friction, Passive Release, Active Release

Active care: Objectives and Options

- Behavioral
  - Decreasing pain related behavior
    - Reassurance / re-activation
  - Relaxation techniques
    - Progressive muscle relaxation
    - Stress reduction / biofeedback
- Biomechanics / Ergonomics
  - Static postures: sitting, sleeping, work station
  - Dynamic postures: lifting, exercising, ADL
- Training (exercise)
  - Flexibility
  - Strength
  - Coordination
  - Endurance

SMT + exercise: winning formula

Evans, R., G. Bronfort, et al. (2002). "Two-year follow-up of a randomized clinical trial of spinal manipulation and two types of exercise for patients with chronic neck pain." Spine 27(21): 2383-9.

Bronfort, G., R. Evans, et al. (2001). "A randomized clinical trial of exercise and spinal manipulation for patients with chronic neck pain." Spine 26(7): 788-97; discussion 798-9.

Active care in chiropractic

- Whereas palliative measures, in particular spinal manipulation, give much needed symptomatic relief and improved activity tolerance in acute pain patients, it is exercise which is proven to be effective in chronic situations. The critical juncture in MP where rehabilitative (active care) rather than palliative measures (passive care) are most important is after six weeks. At this point, the likelihood of recovery drops dramatically and both physical and psychological deconditioning become the main factors responsible for perpetuation of MP.

http://www.chiroweb.com/archives/17/08/06.html [Liebenson]

Spinal stabilization

- Reconditioning primary stabilizing muscles
  - Multifidus, QL, abdominal muscles
  - Build endurance while preserving NMS control and coordination
- Minimizes stress during activity
- Not intended for acute patients
- Components
  - Identify correct posture (neutral spine) during increased exercises
  - Maintain neutral spine in ADL

Wobble board

Select conditions

- IVD
- Lumbar spinal stenosis
- Spinal arthralgia
  - Facet syndrome
  - Sacroiliac syndrome
- Spondylolisthesis
- Ankylosing spondylitis
- Abdominal aortic aneurysm

IVD

- Mechanisms
  - flexion + torsion + compression → annular tear and disc herniation
    - Bulge, protrusion, extrusion (prolapse), sequestration
  - Compression → endplate fracture, IDD, degenerative disc disease
- Etiology
  - Cell nutrition
  - Matrix degradation and modification
  - Mechanical loading effects

Foster on the bulging disc

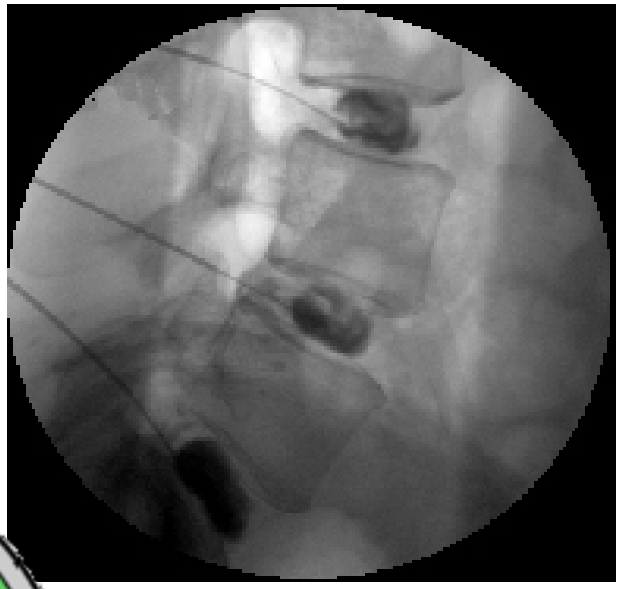
Most patient with bulging discs do not have nerve pressure

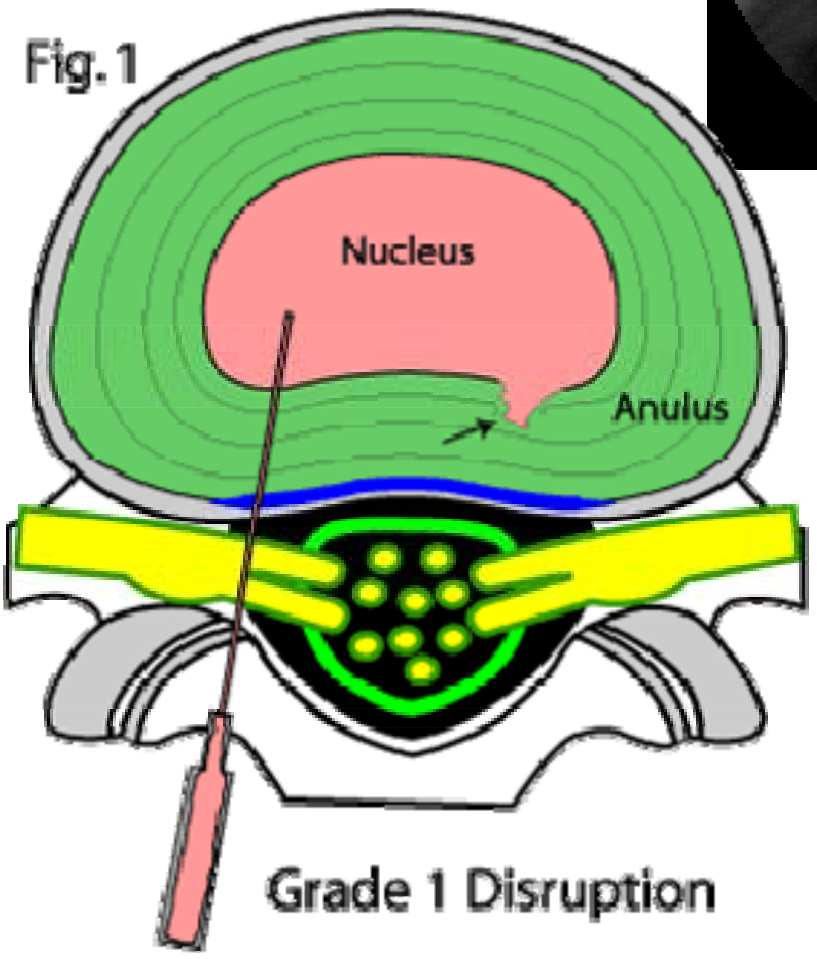
Pain results from inflammation related to the bulge itself, not a neurological situation

Long term outlook is good, due to the stabilizing effect of aging, unless associated spinal stenosis

Even when the short term pain is severe, that does not exclude complete resolution and full

Discogram





Discography: increasing the accuracy (Derby)

- pressure controlled discography is like palpation for tenderness, in which the contrast dye evokes pain by two mechanisms:
  - By stimulating nociceptive free nerve endings (at low pressures) and by increasing intradiscal pressure
  - By distending tissues (at higher pressures).

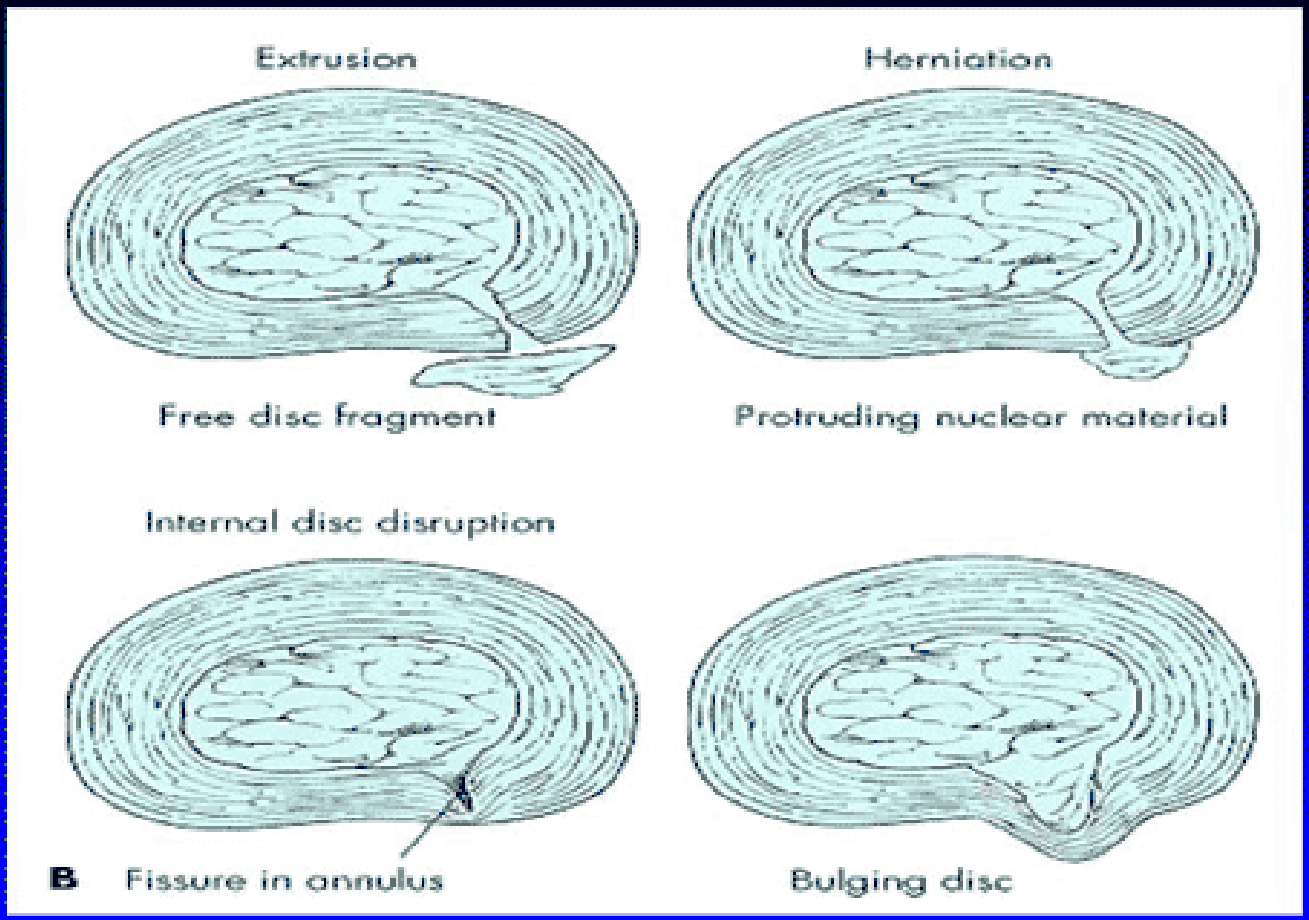
Disc pathology

Thompson's Classification of Disc Degeneration

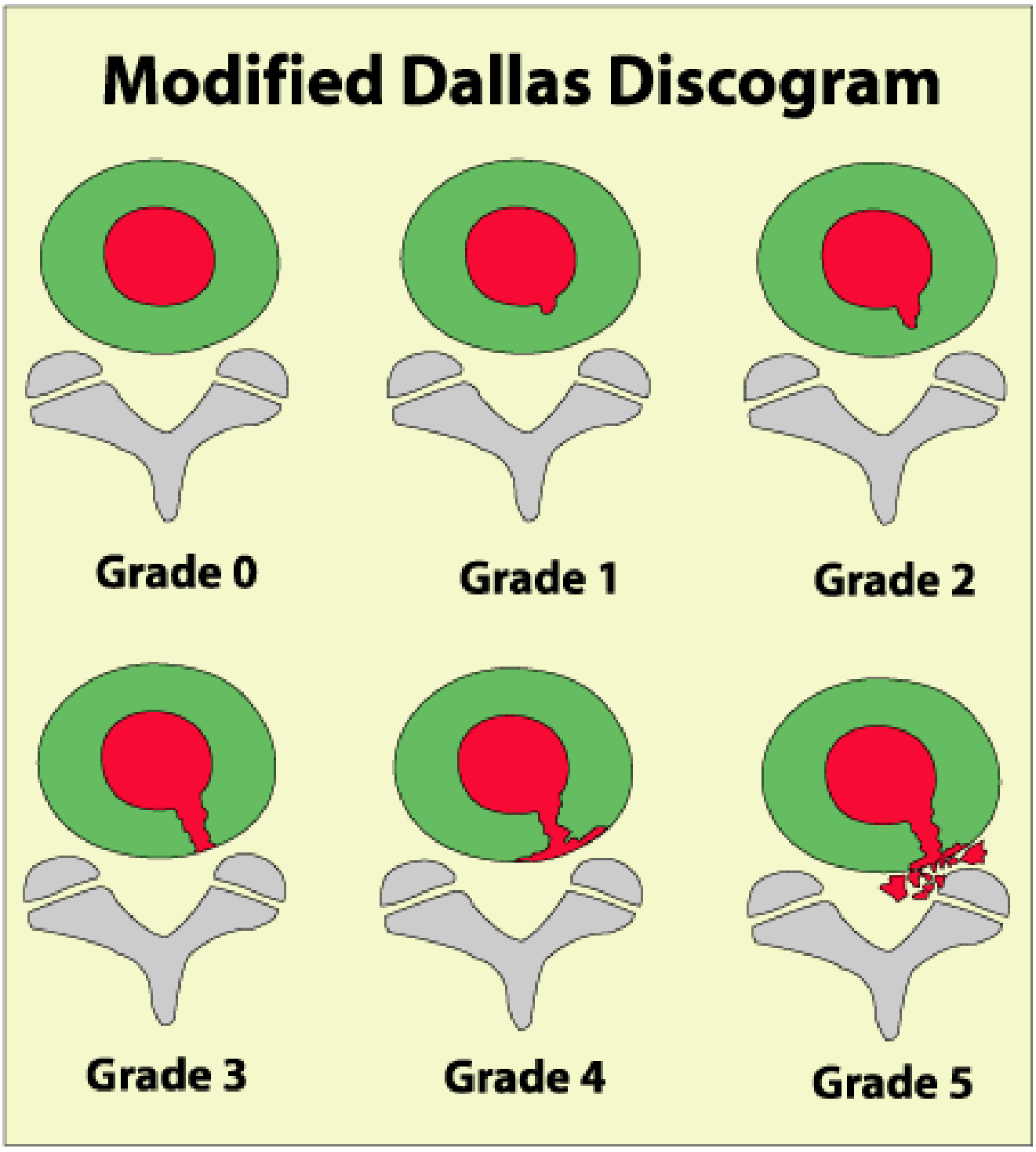
Grade	Nucleus	Annulus	Endplate	Vertebral Body
I	Bulging gel	Discreet fibrous lamellae	Hyaline, uniformly thick	Margins rounded
II	White fibrous tissue	Mucinous material peripherally	Thickness irregular between lamellae	Margins pointed
III	Consolidated fibrous tissue	Extensive mucinous infiltration; loss of annular-nuclear demarcation	Focal defects in cartilage	Early chondrophytes or osteophytes at margins
IV	Horizontal clefts parallel to endplate	Focal disruptions	Fibrocartilage extending from subchondral bone; irregularity and focal sclerosis in subchondral bone	Osteophytes less than 2mm
V	Clefts extend through nucleus and annulus		Diffuse sclerosis	Osteophytes greater than 2mm

Thompson JP, Pearce RH, Schechter MT, Adams ME, Tsang IK, Bishop PB. Preliminary evaluation of a scheme for grading the gross morphology of the human intervertebral disc. Spine 1990;15:411-415.

Disc morphology



Dallas grading



Inproving the accuracy

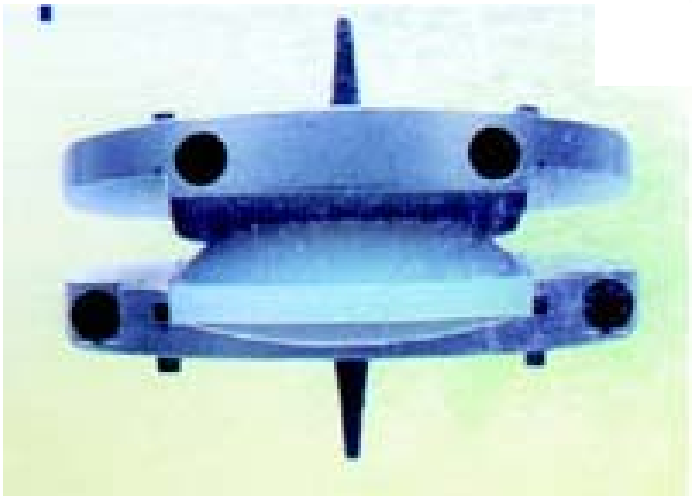
- Accuracy of lumbar discography in distinguishing symptomatic from non-symptomatic discs approaches 100% if the following criteria are met:
  - careful measurement of intradiscal pressures and opening pressure (where dye is first seen in nucleus)
  - VAS pain over 6/10 with less than 50 psi
  - less than 3.5 ml of dye injected
  - Evoked pain concordant with incoming pain
  - Adjacent discs not pain-provocative
  - Rule out psychological explanations

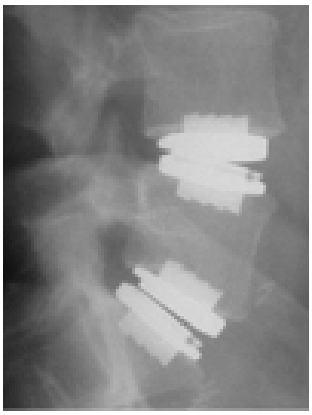
From the new surgery department . . .

- Two relatively new devices
  - X-stop device for spinal stenosis (Dr. Hsu of Stanford)
  - Artificial intervertebral discs (Dr. Zucherman of Saint Mary's Spine Center)

Artificial discs

Charité Artificial Disc





ProDisc Modular Total Disc

the artificial disc does not transfer mechanical stress to other vertebral levels, thus reducing the risk of future surgeries; it is also relatively inexpensive,

What CSI has to say

ROBBINS: Pulled it from the L4-L5 interspace. Cobalt chromium molybdenum alloy with a titanium coating and an ultra high molecular weight polyethylene component. An artificial spinal disc. If you can recreate a spine the possibilities are endless.

CATHERINE: I thought, uh, disc replacement surgery involved fusing bone to bone.

ROBBINS: Eh, typically, but it can limit mobility. With that little disc, your body doesn't know the difference.

ROBBINS: Matches range of motion, flexibility and an axial rotation of a normal spine.

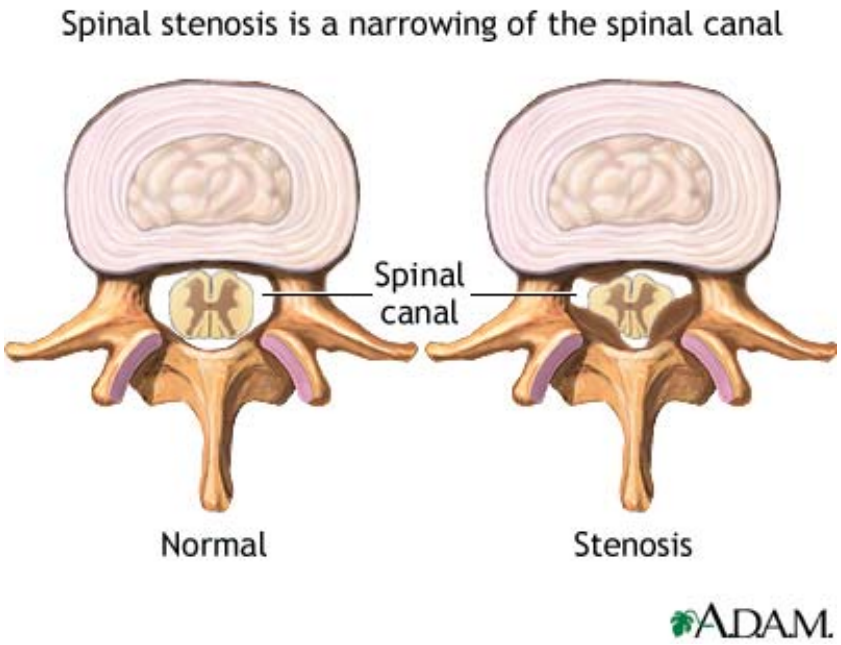
ROBBINS: Still in clinical trials. Less than a thousand surgeries have been performed in this country.

CATHERINE: Oh, well, I like those odds.

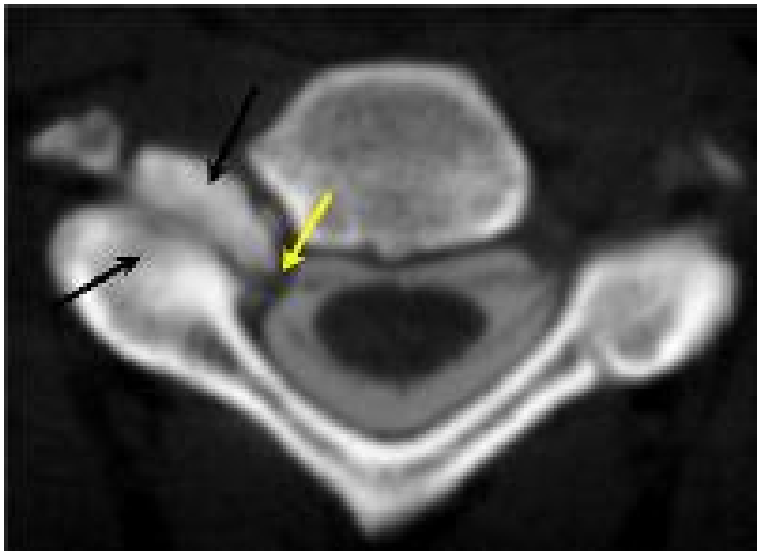
ROBBINS: You'll like this even better. Medium endplate, size 12, polyethylene component and a six-degree lordosis angle. Narrowed it down to one.

Amy Ennis. Austin, Texas.

Spinal stenosis, central and lateral recess



Central canal stenosis

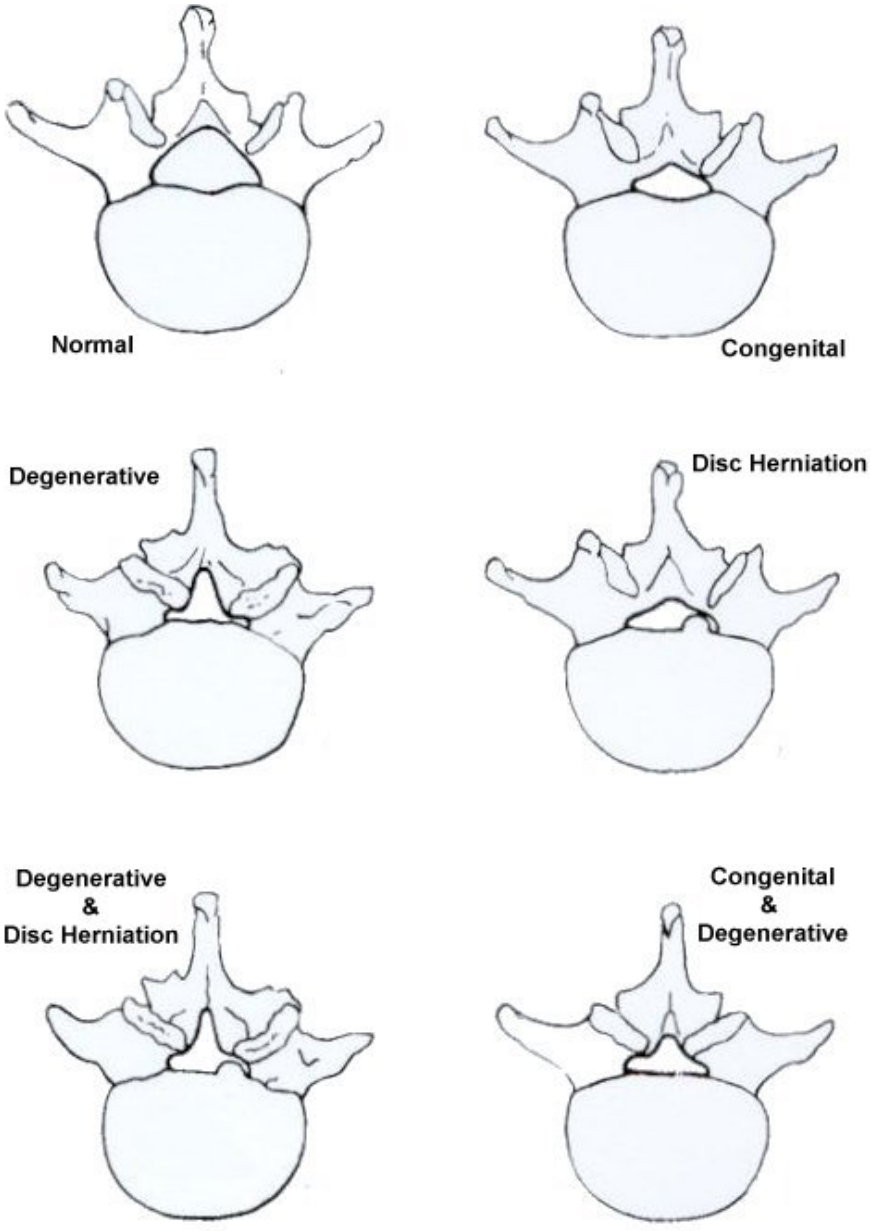


Axial cervical CT myelogram demonstrates marked hypertrophy of the right facet joints (black arrows), which results in tight restriction of the neuroforaminal recess and lateral neuroforamen.

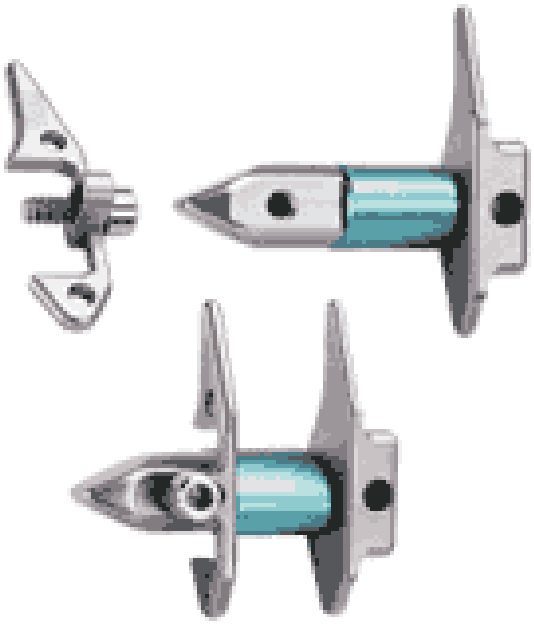
Lumbar spinal stenosis

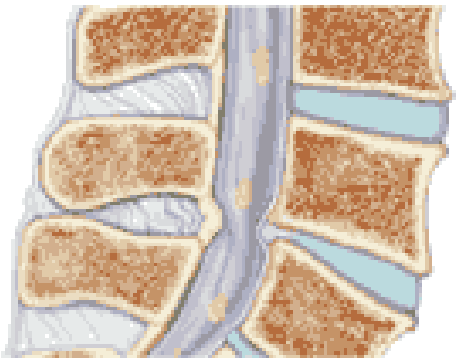
- 1.7-8% population had deg. type
- Causes:
  - Bone hypertrophy
  - Ligament hypertrophy
  - Disc protrusion
- Low back and leg (90%) pain, or neurogenic claudication type
  - Pain, paresthesia, dec sensation and/or motor
  - walking/stand exacerbates

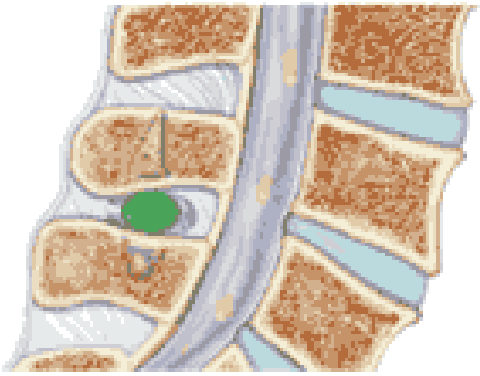
Types of spinal stenosis



X-Stop device





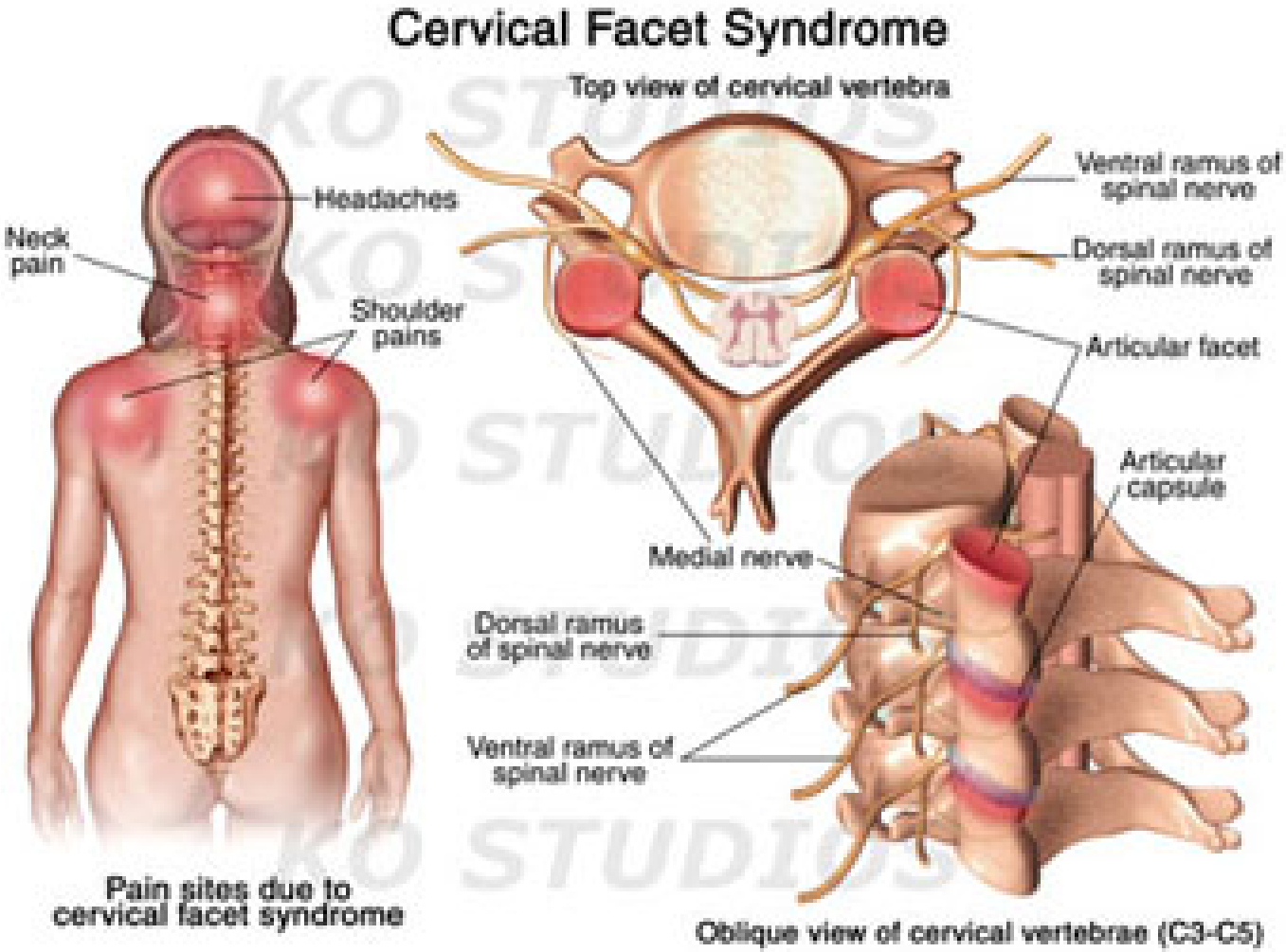


The initial data in an FDA-approved multisite study are showing clinical outcomes about twice as good as the nonoperative control group that was treated with existing conservative measures. The x-stop also seems preferred to laminectomy, the standard surgical treatment, because it has less adverse consequences and complications.

Spinal arthragia

- Facet syndrome
  - Lumbar pain
  - Refers to post thigh, or ant thigh or inguinal area
  - Prob not to leg
  - Kemp’s, etc ??
- SIJDS
  - PSIS pain, not lumbar spine
  - Buttock, hip, post thigh, inguinal region, lat thigh?
  - Some leg referral
  - Ortho tests: Gaenslen’s, gap, compression, MP (?)

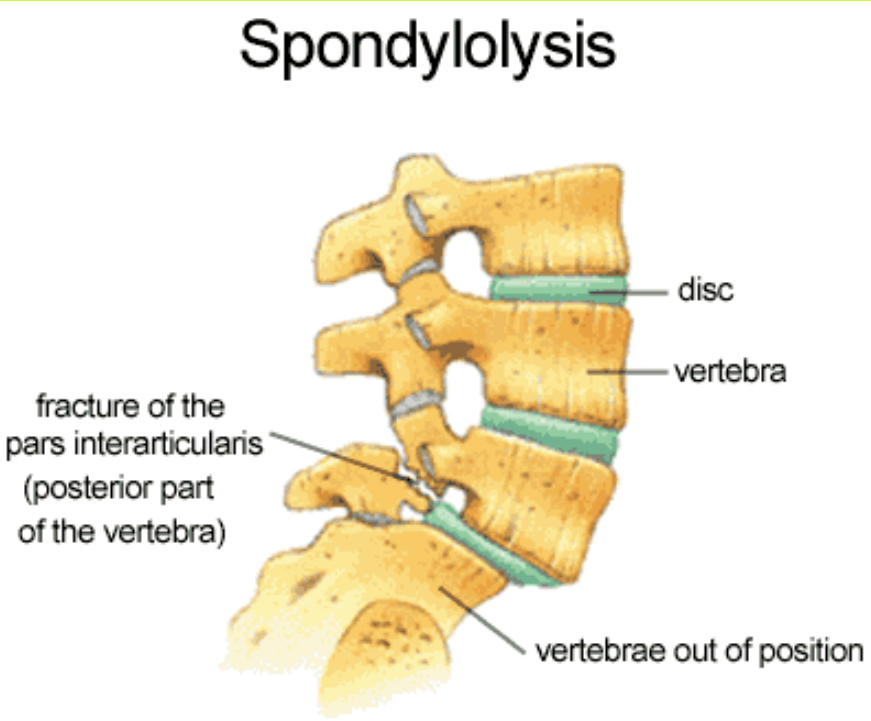
Facet syndrome



Spondylolisthesis

- I dysplastic (congenital)
- II isthmic (pars defect)
  - Lytic (fatigue fracture, hereditary)
  - Elongated, intact pars
  - Acute fracture
- III degenerative (chronic instability of z-joints)
- IV traumatic: fracture other than pars
- V pathologic (malignancy, primary bone disease)

Spondylolisthesis



spondylolytic

dysplastic

Ankylosing Spondylitis

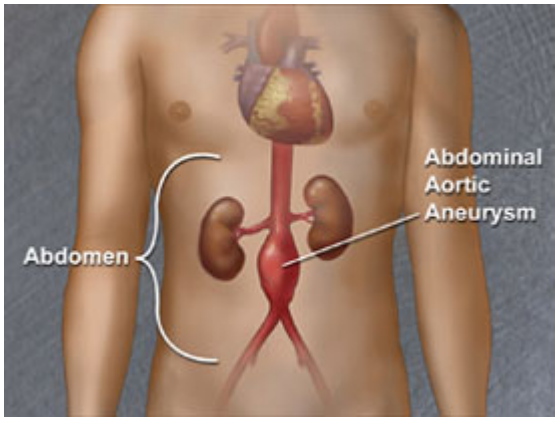
- < age 40
- Insidious onset
- > 3 months persistence
- Morning stiffness
- Improves with exercise
- HLA-B27
- Atlantoaxial subluxation

Ankylosing spondylitis

Abdominal aortic aneuryism

- Chance finding, 3-5.4% men > 65
- LBP and/or abdominal pain, w/ fullness or pulsation in abdomen
- May rupture, 90% death rate
- Risk factors:
  - Smoking, HT, age, male, COPD, claudiacation, familial

Aortic aneurysm



Patient referrals

- Reasons to refer
- Outgoing referral
- Incoming referral

SE Mendelson, Esq.: Personal Injury Claims and the Doctor

"Jurors come to the courtroom full of skepticism for the injured party and their attorney." They, at least initially, usually afford the doctor some degree of respect, but that will not last long if the doctor is not able to teach the jurors enough chiropractic medicine to withstand the defense barrage.

Haldeman: Are Your Treatment Protocols Evidenced-Based?

- the cost of treating back pain has gone up exponentially, while the impact of this increased cost and amount of care on such pain appears to have been minimal.

- Although in a research setting it is commonly stated that “lack of evidence is not evidence of lack,” this does not carry over very well into a third party payment setting, where lack of evidence often translates into lack of reimbursement.