MOD 4 Disc Pathology

Case Presentation

55 yo male (Matt) presents to office

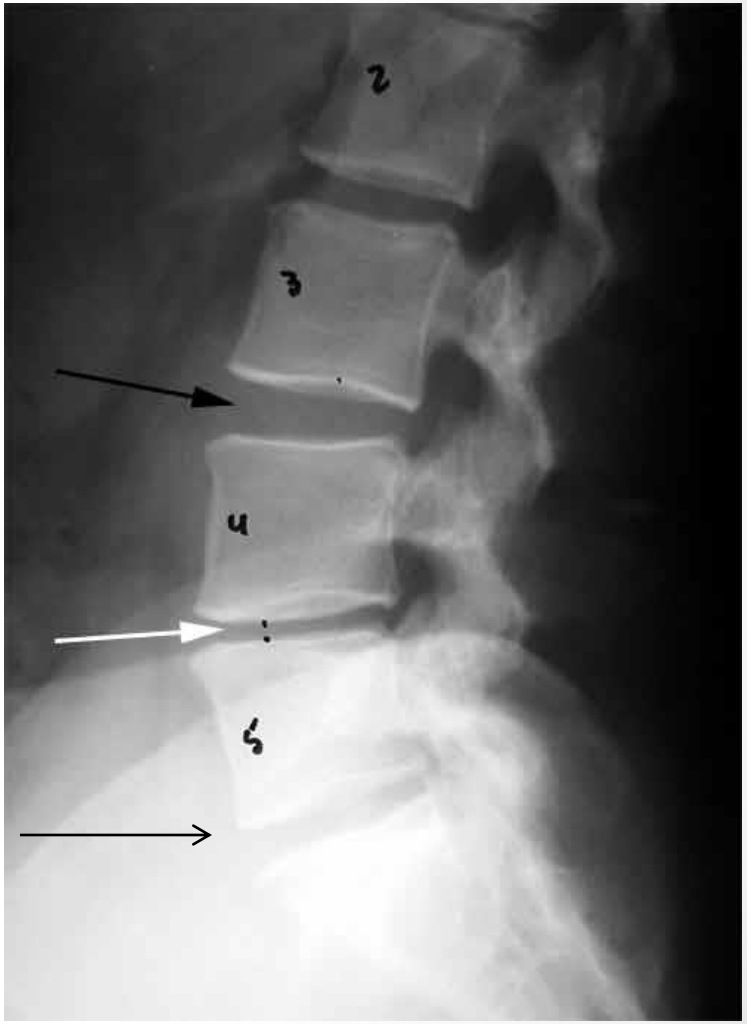
Factory worker
6 mo off and on pain in lower back getting progressively worse
VAS 4/10 but has gone to a 9/10 after working
Starting to travel down legs to thighs to big toe (tingling)
Has trouble as day progresses
Tried OTC meds, only temp help
No previous episodes
No previous spinal surgery

Plain film

normal

Degeneration

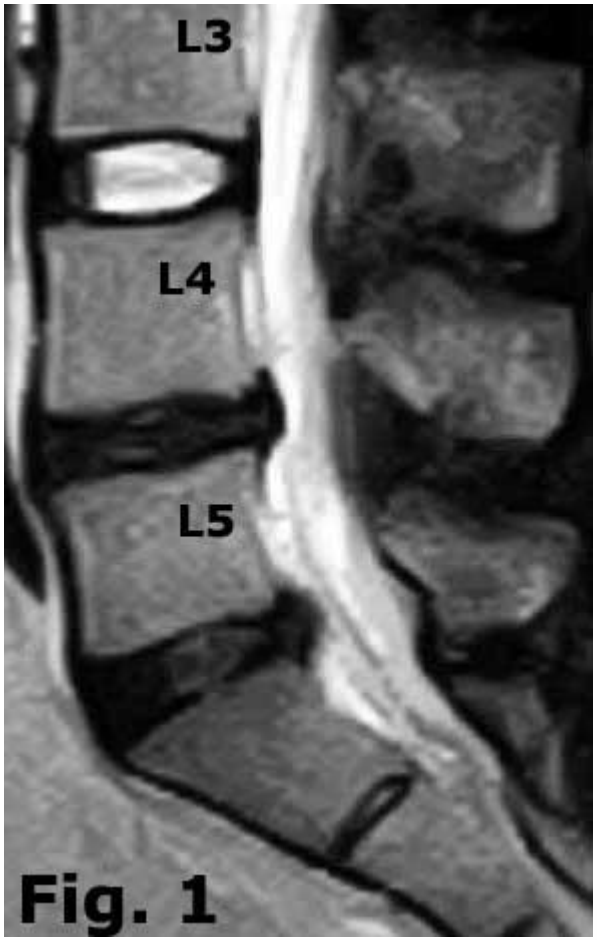
Degeneration

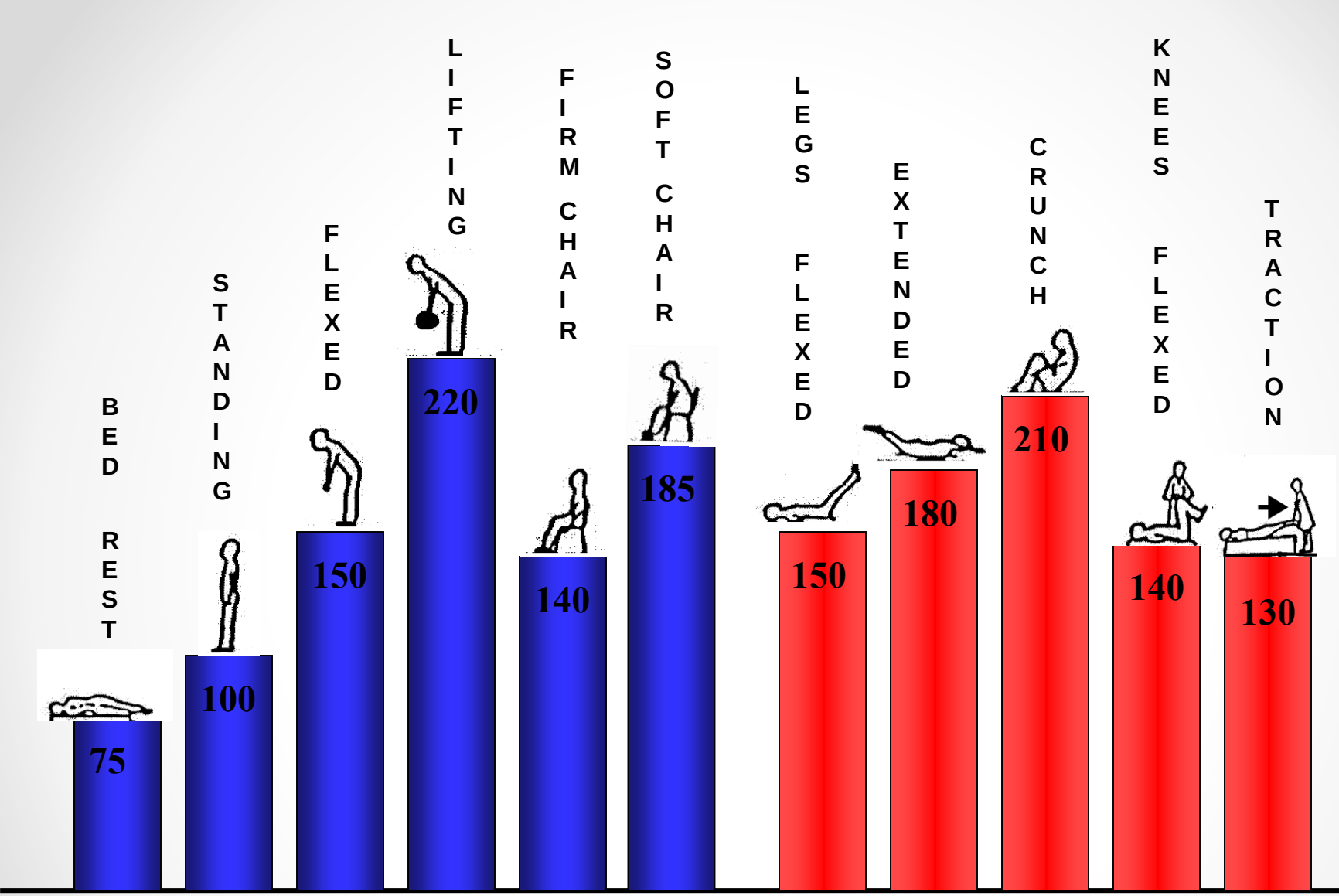


MRI

Normal

Disc Desiccation





Ergonomics. 2001 Jun 20;44(8):781-94.
Comparison of intradiscal pressures and spinal fixator loads for different body positions and exercises.
Rohlmannt A[1], Claes LE, Bergmannt G, Graichen F, Neef P, Wilke HJ.

Let's dig in

Closer look at disc pathology and degeneration

Physical Exam

Commonly used ortho tests.

Antalgia

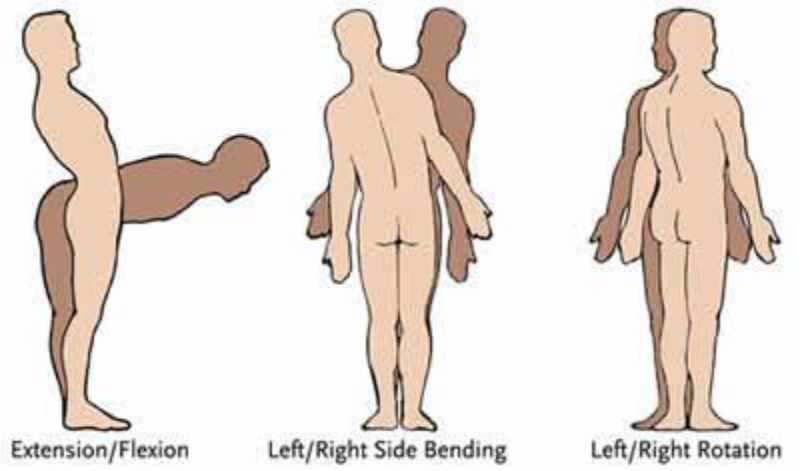
Lean into pain side = Medial

Lean away pain side = Lateral

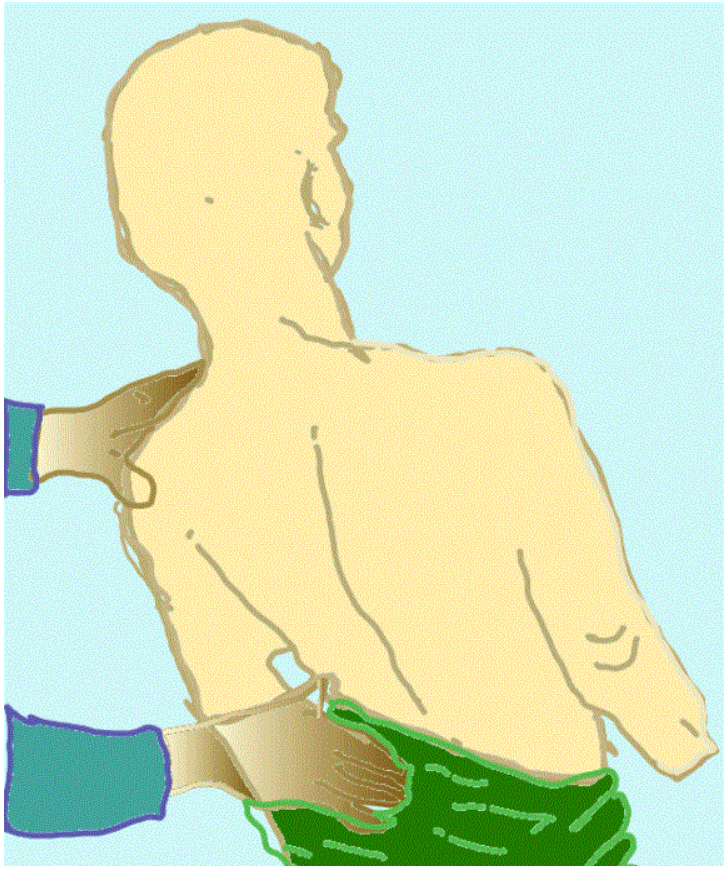
Lean forward =Post disc

ROM

- We always perform and measure ROM



Standing Kemps test



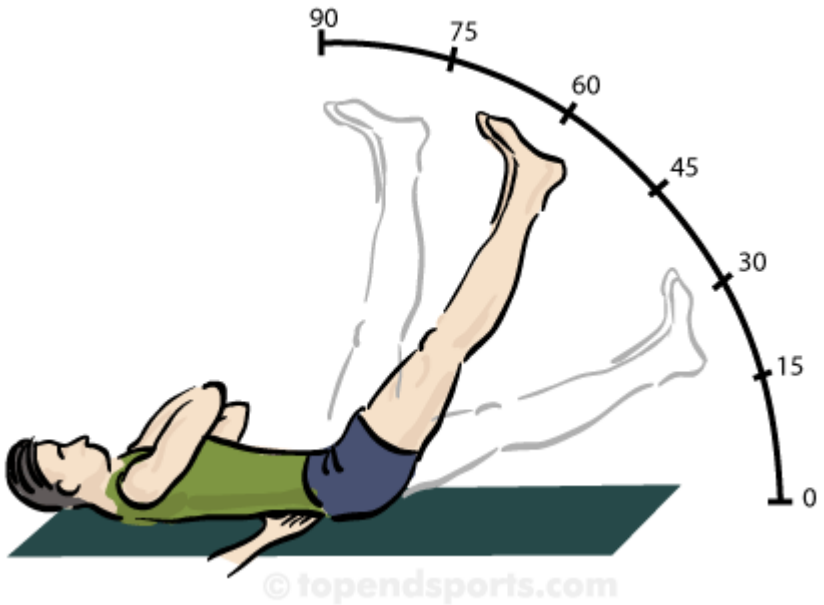
Can be performed standing or sitting.

RO facet irritation

Farfan's Torsion Stress Test

Start at T12 and work down

SLR



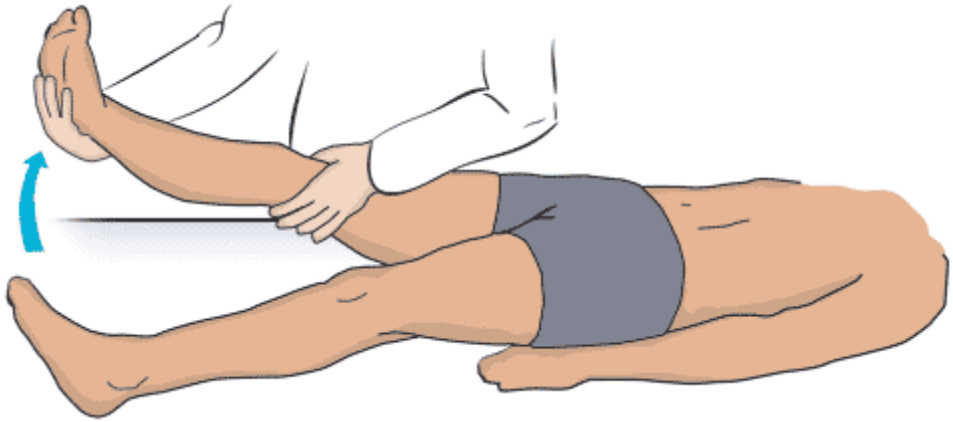
0-30 deg
Nerve root compression

30-60 deg
SI involvement

60+
Lumbosacral

Remember the nerve roots are not brought to tension until after at least 35 deg of flexion. So the lesser angle that pain is produced the more likely disc involvement.

Braggards



Perform after SLR.
Lower leg just below level of pain and sharply dorsiflex the foot and notice if same pain is reproduced as was in SLR

Perform on un involved side first

If dorsiflexion produces pain in 0-35 degree (of SLR), suspect extradural sciatic nerve irritation
If dorsiflexion produces pain in 35-70 degree (of SLR), suspect intradural sciatic nerve irritation (disc pathology)

Bowstring Test

Perform SLR on involved side. Upon pain, bend knee 20 degrees to reduce pain. Press in the popliteal fossa and if pain is reproduced consider sciatic nerve involvement, S1 irritation

Strength tests

L1, L2- Hip flexion (Psoas, rectus femoris)

L2,3,4 – Knee extension (Quads)

L2,3,4 -- Hip adductors (adductors and gracilis)

L5 – ankle/ toe dorsiflexion (ant. Tibialis, EHL)

L5– Hip abductors (gluteus medius, TFL)

S1- ankle plantarflexion (gastroc/ soleus)

S1– Hip extensors (Gluteus max., Hamstrings)

Inflammatory vs Mechanical Back pain

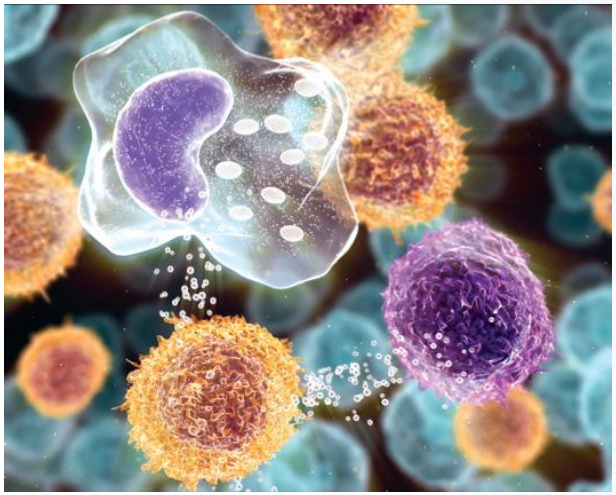
Severe Disc pathology patients will exhibit one or both of these conditions.

Man Ther. 2009 Jun;14(3):314-20. doi: 10.1016/j.math.2008.04.003. Epub 2008 Jun 13.
Mechanical or inflammatory low back pain. What are the potential signs and symptoms?
Walker BF[1], Williamson OD.

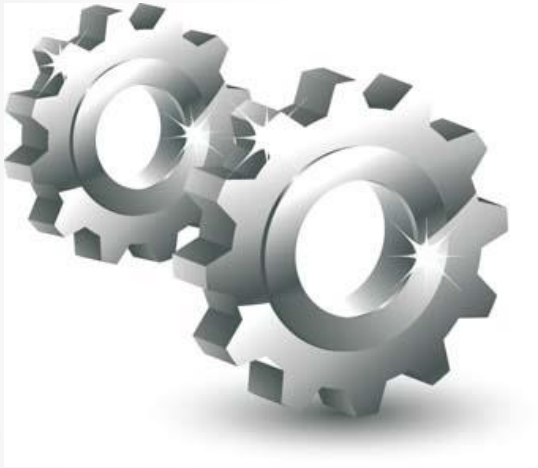
Chemical (Inflammatory)

- **Pain that doesn't go away at night, awakens you.**
- **Improves with exercise, and walking throughout the day.**
- **Worse in the morning**
- **Can alternate sides. Esp. in the glutes**

Dr. Michael Weisman MD



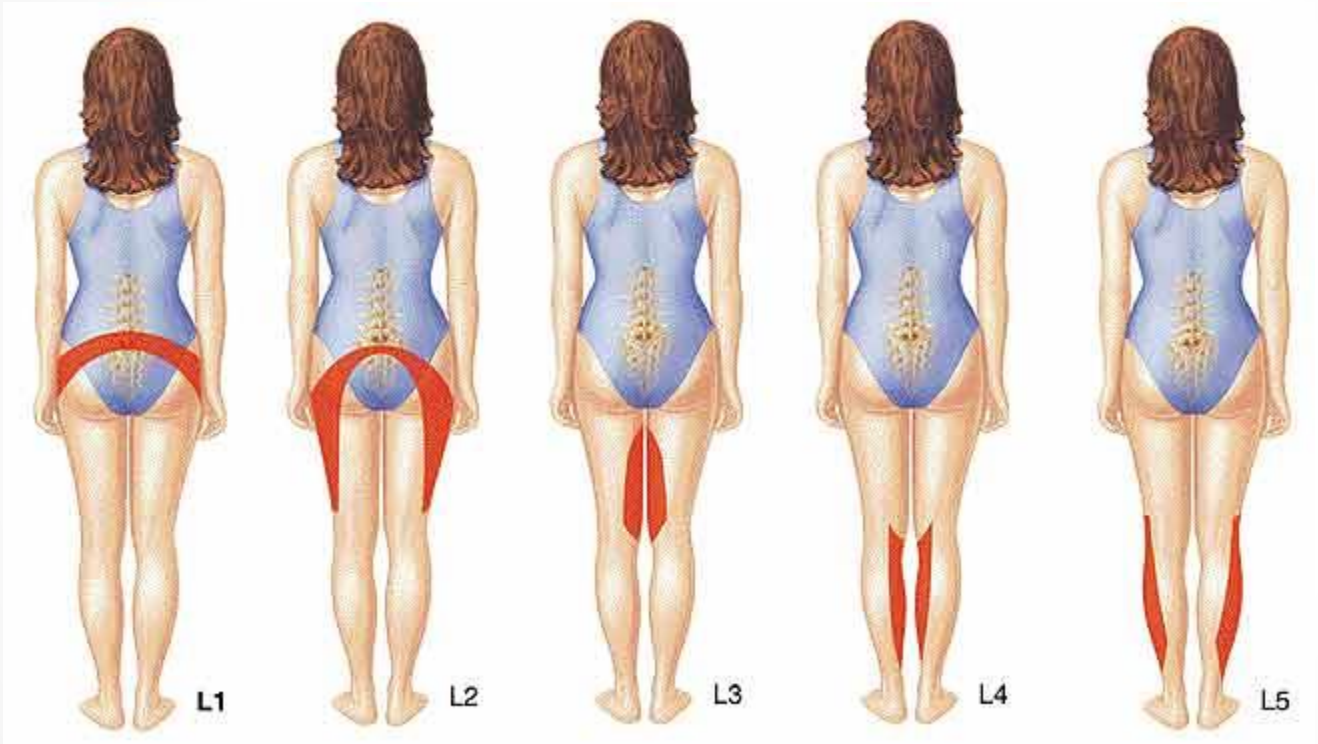
Mechanical



- **Back pain that goes away when you go to bed**
- **As day goes on gets worse**
- **Exercise increases pain**
- **Usually associated with a trauma, sneezing, lifting.**

Dr. Michael Weisman MD

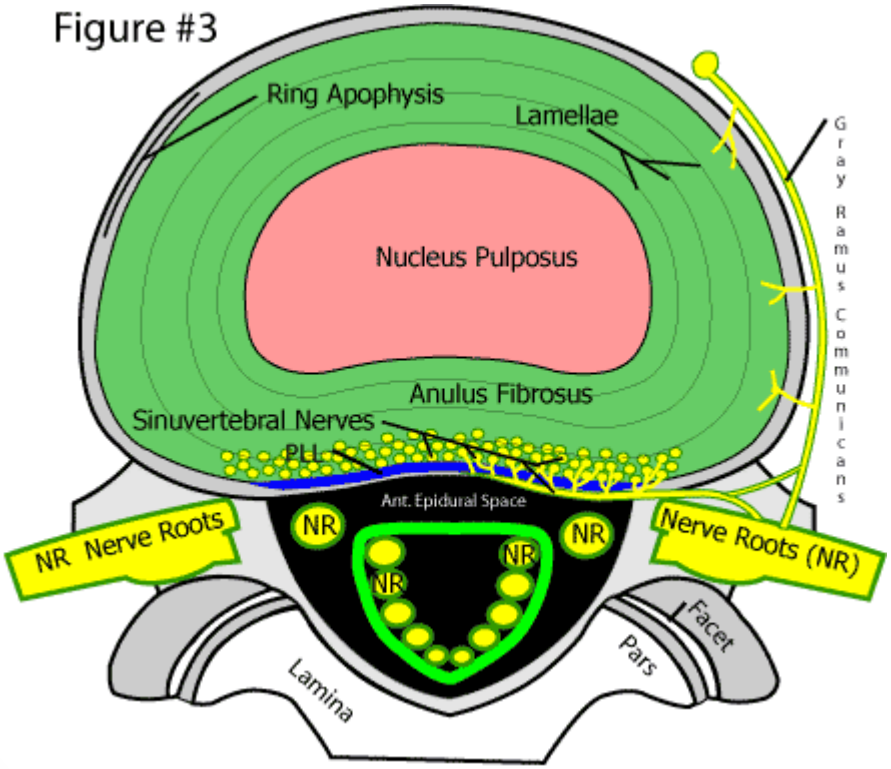
Mechanical pain patterns



Anatomy 101

- Deeper look at the anatomy and physiology of the disc

Normal Disc



Drawings courtesy of "Chirogeek"

Basic Disc Anatomy

Annulus

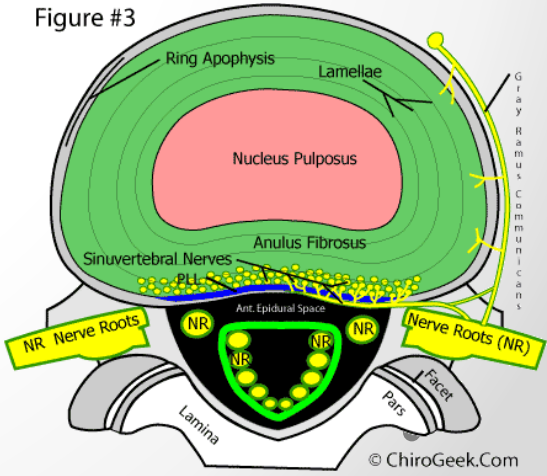
roughly 60-65% H20 (rest is collagen matrix)

Nucleus

roughly 80% H20 (rest is proteoglycan agrecans)

These two are composed primarily of 2 main components

1. Proteoglycan (nucleus)
2. Collagen (annulus)



Nucleus

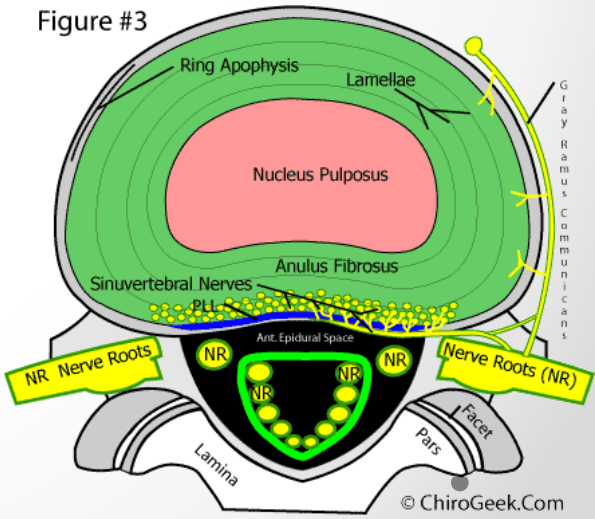
Substance consistency of toothpaste

80-85% water

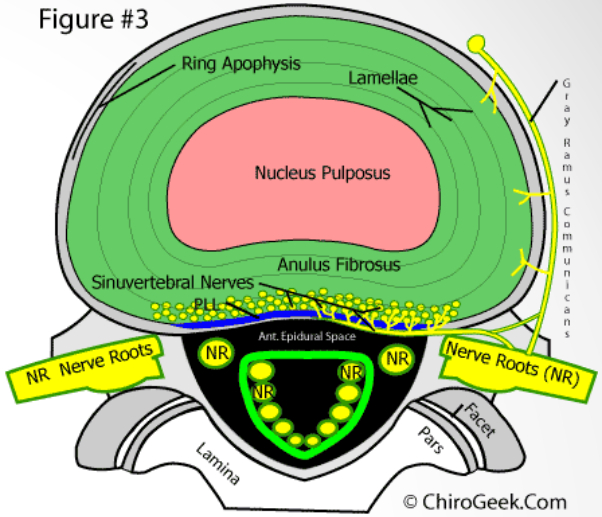
Cells of nucleus produce structures called "proteoglycan agrecans" these are hydrophyllic.

Job is primary support of axial weight

Secondary is to "hold up the lamellae"



Annulus



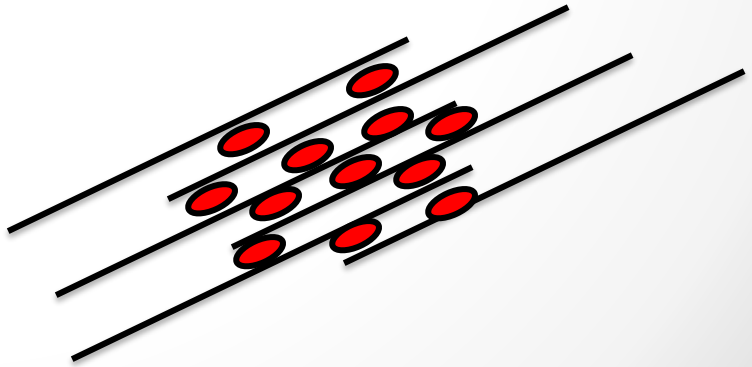
Outer portion made up of "sheets" or "rings" usually around 15-25 layers

Layers are called lamellae

Lamellae are "glued" together by proteoglycan's

Fibers arranged at 60-70 degree angles to support shear forces

Supports the nucleus



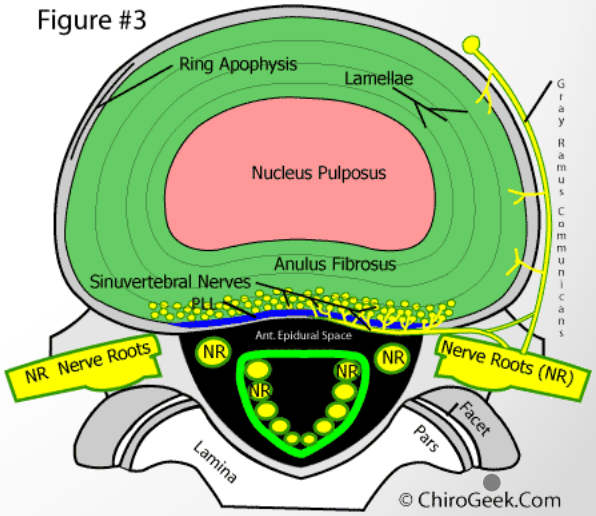
Disc Anatomy Function

Normal Healthy Disc
Nucleus supports the majority of the axial loads

Annulus provides support

Unhealthy Disc
Disc dehydration causes shifting of axial load to annulus.

Biochemical reactions take place.



Degeneration physiology

Increase in axial load causes increase in intradiscal pressure.

Proteoglycan synthesis stops (anhydrosis begins) Disc cells need @ 3atm to function normally.

What water is left is slowly being forced out.

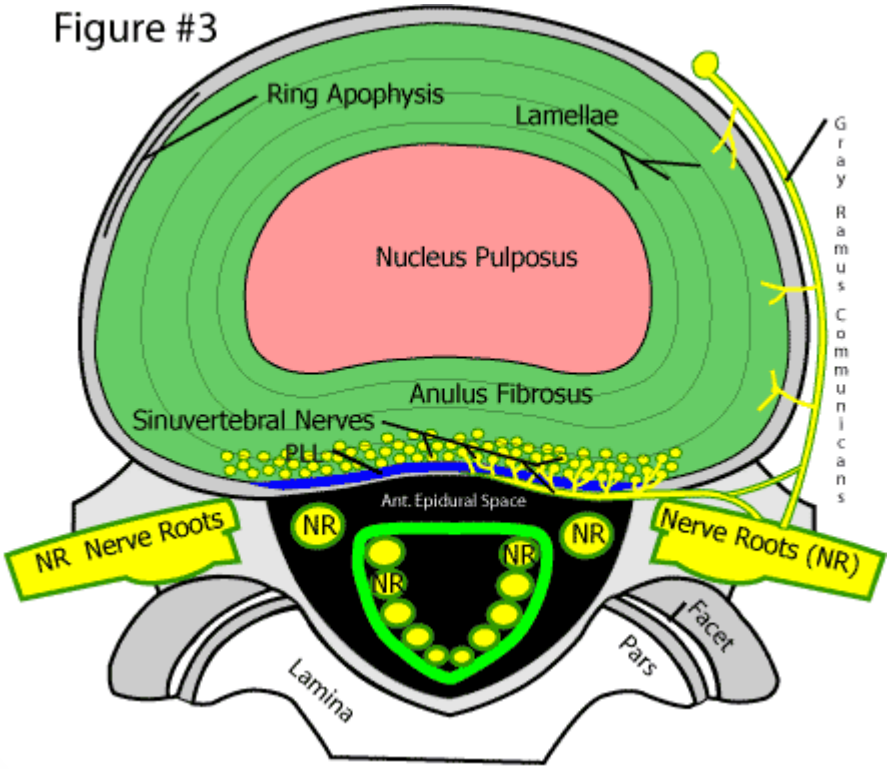
H20 leaves (H20 is basic) and the disc becomes acidic, further diminishing cell reproduction.

Nucleus deforms, shifts axial load to annulus causes lamellae to fold inward.

Classification of Disc Pathology

1. Disc Bulge – out pouching into epidural space
2. Protrusion- PLL Contained/Sub-ligamentous
3. Extrusion- Non Contained/Trans-ligamentous
4. Sequestered – Free fragment

Normal Disc

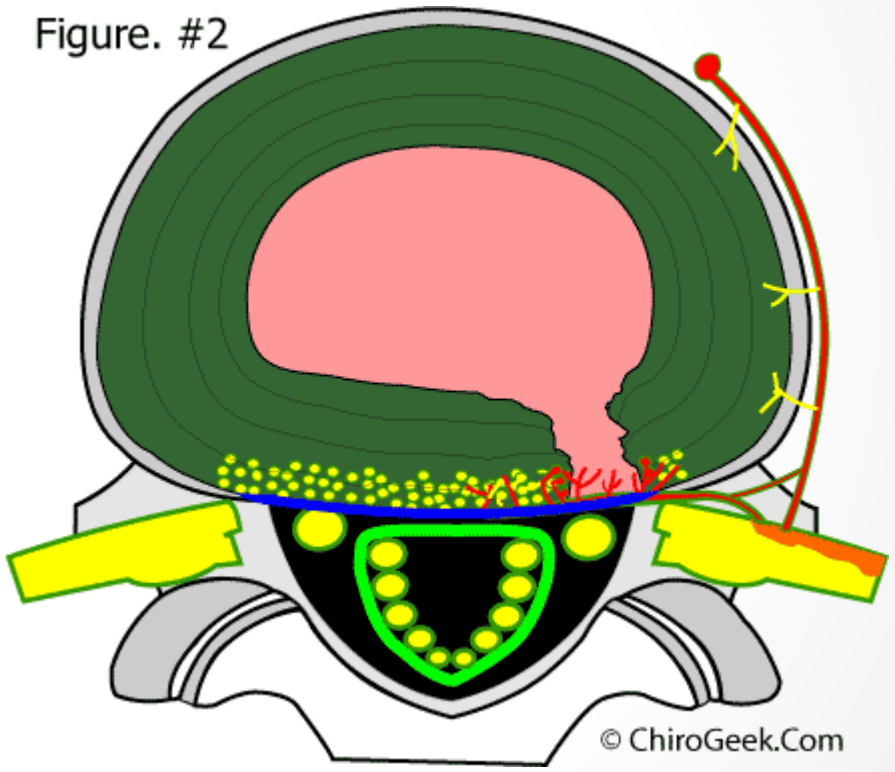


Drawings courtesy of "Chirogeek"

Disc Bulge

This is typically a Dallas Grade 3 and is usually the precurser to the herniated Disc.

PLL is intact, (but starting to bulge). Patient may not show signs on the MRI but may experience disc symptoms due to (IDD)

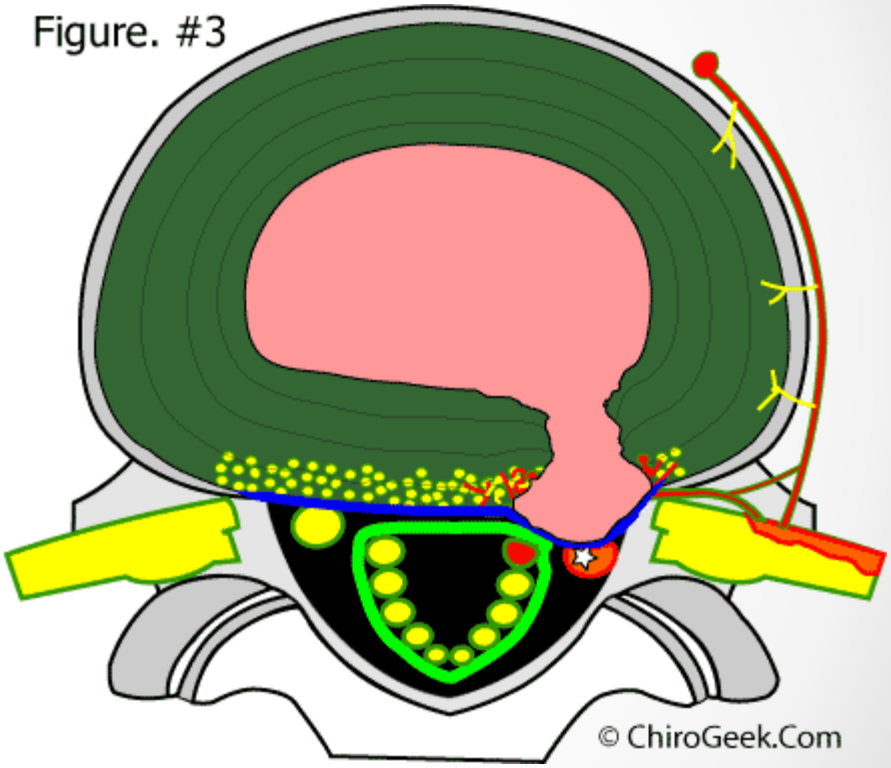


Disc Protrusion

PLL still intact and disc still contained.

Patient at this point will demonstrate pathology on MRI and will have positive disc findings.

Look for dermatomal patterns suggestive of nerve compression.

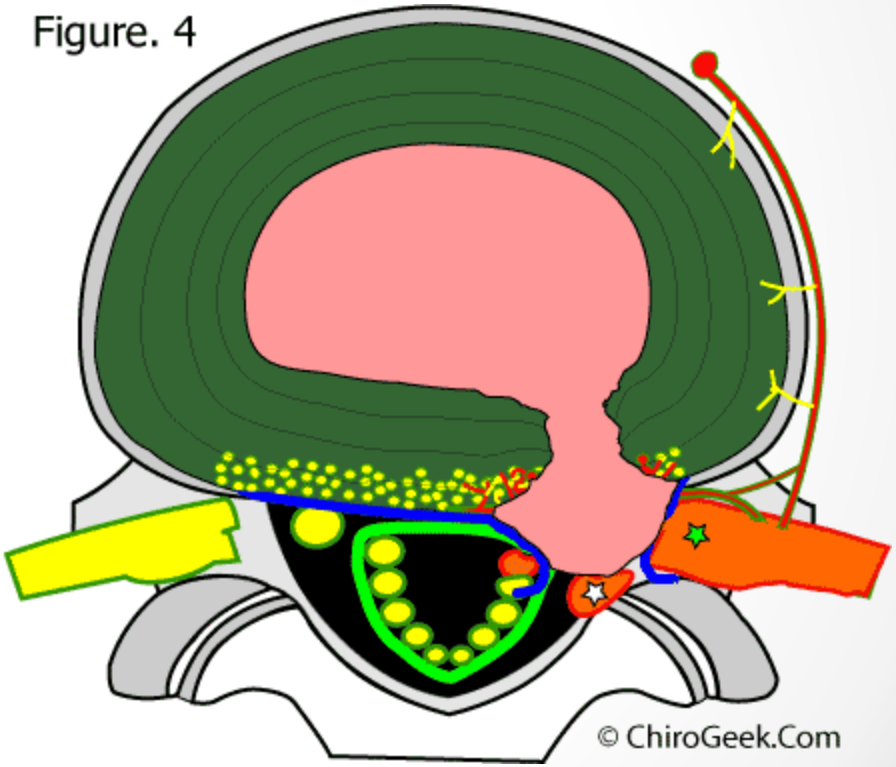


Disc Extrusion

PLL has been compromised

Chemical Radiculitis possible

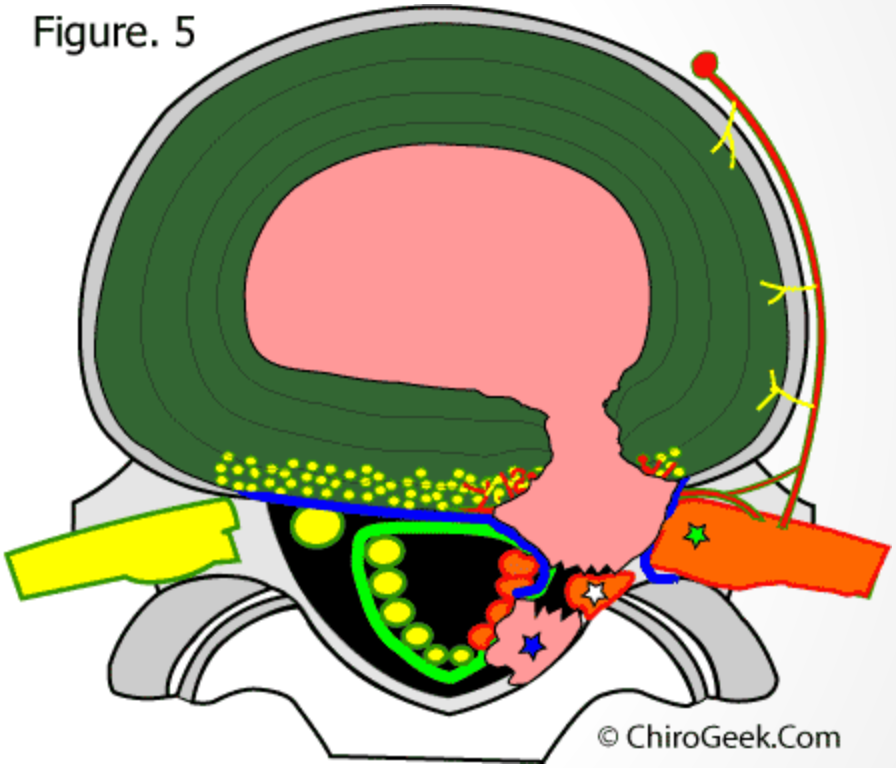
Patient will have MRI observations and demonstrate disc pathology in physical exam.



Disc sequestration

PLL is more compromised

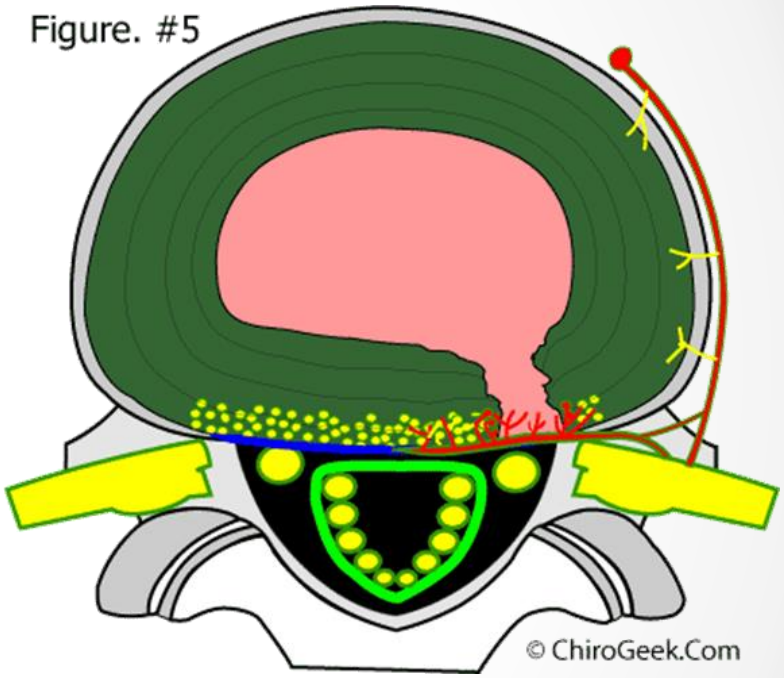
Disc material has detached itself from the main body and now there is a free floating fragment within the epidural space.



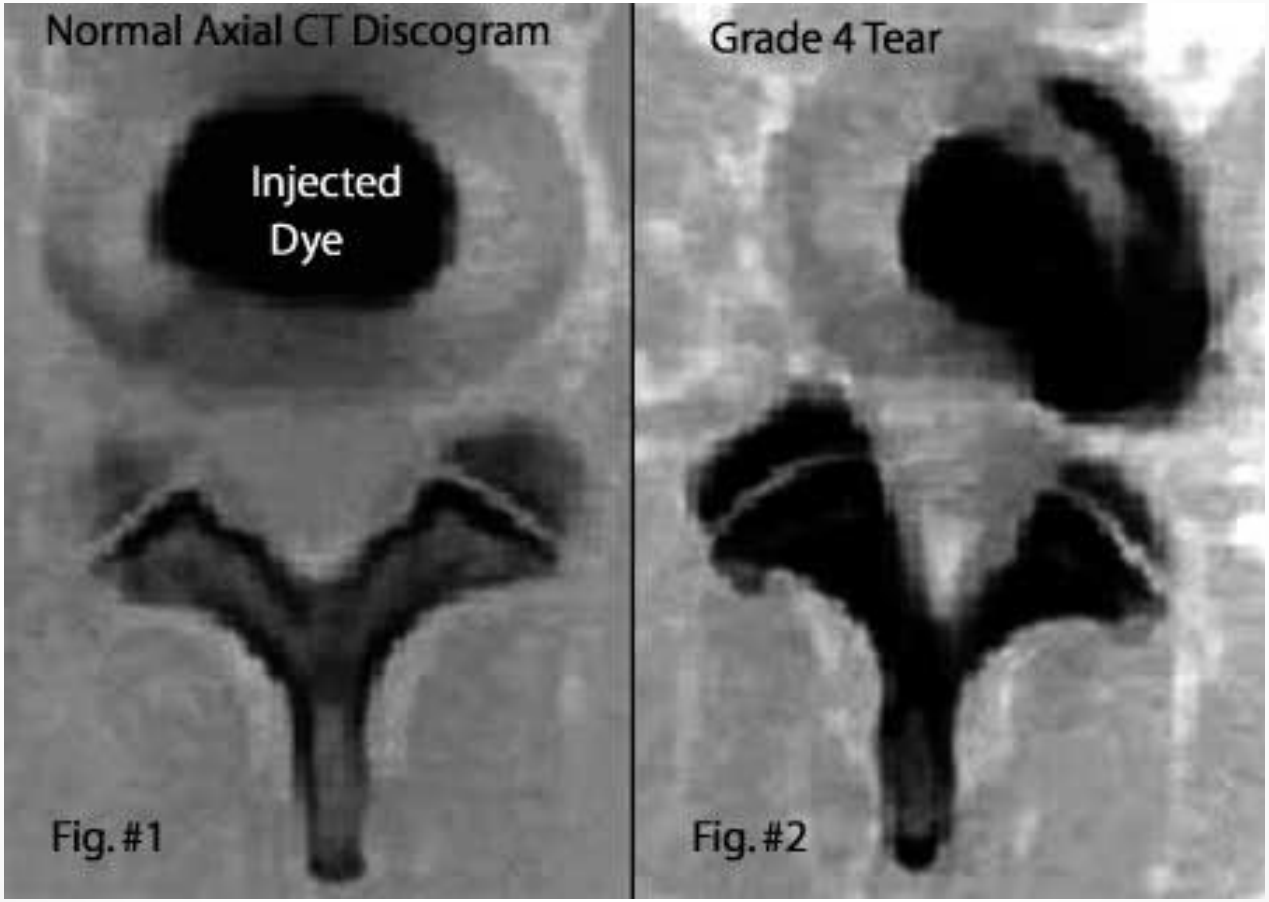
IDD

IDD (internal disc disruption)

- Painful when reaches post 1/3 of annulus and Sinuvertebral nerve.
- Possible Chemical radiculitis
- CT or Disco-gram to determine level of internal tear



Discogram



Disc Migration patterns

McKenzie;

Nucleus will move away from side of compressive loading

Ex. *Flexion =nucleus moves posterior*

Extension = nucleus moves anterior

In severely degenerated discs this may not be the case however due to extreme loss of fluid matrix.

Also method of tracking migration is only useful for enclosed discs. Extruded and sequestered discs react differently

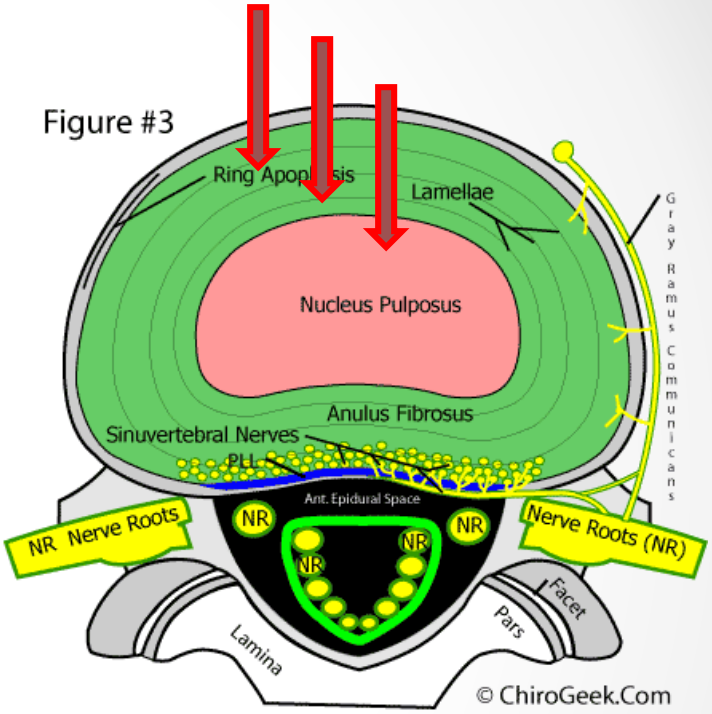
Fact and Fiction of Disc Reduction: A Literature Review *Peter A. Huijbregts, MSc, MHSc, PT, OCS, MTC, CSCS*
This article reviews research on the effects of manipulation, traction, and McKenzie

Migration scenarios

Patient flexes = 0 pain

centralization of radiating pain occurs:

Consider anterior disc lesion



Rationale:

As pt flexes forwards, the nucleus is migrating posterior towards the center of the disc. This is reducing peripheralization and encouraging centralization.

If doing traction/decompression place pt supine with pelvic flexion.

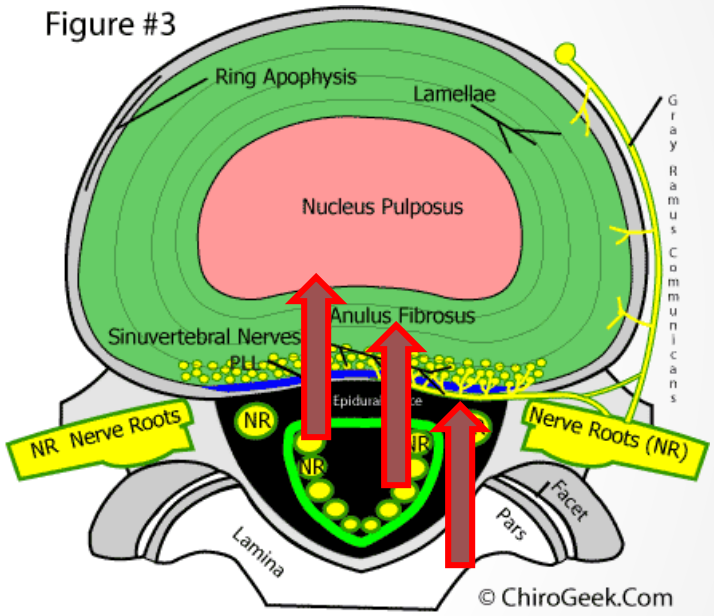
Migration Scenarios

Patient extends = 0 pain
centralization of radiating pain
consider posterior disc lesion
consider treating patient prone

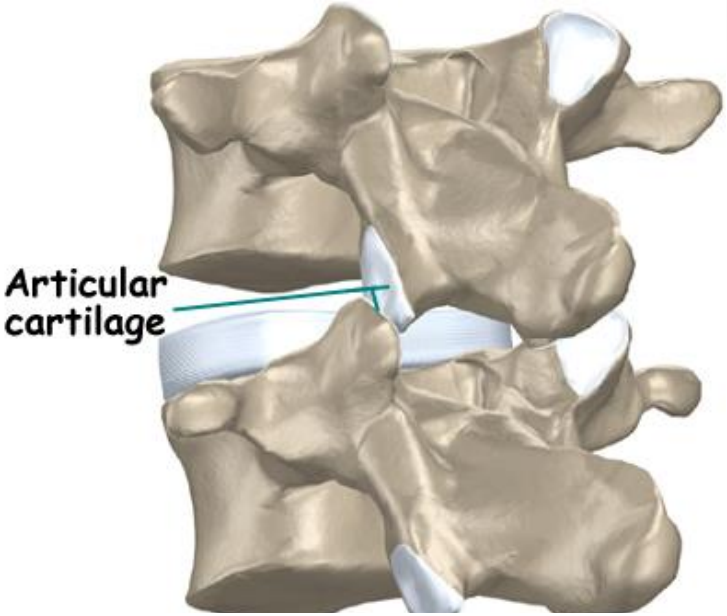
Rationale:

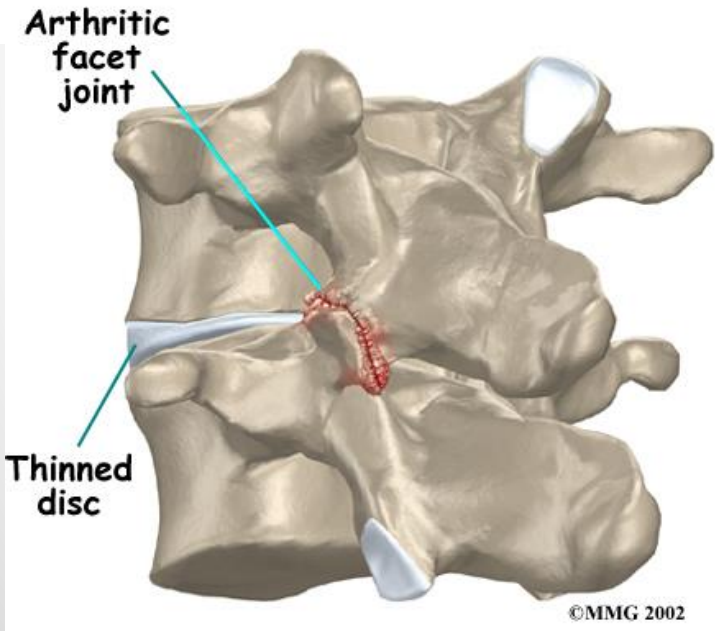
As pt extends, the nucleus is migrating anterior towards the center of the disc. This is reducing peripheralization and encouraging centralization.

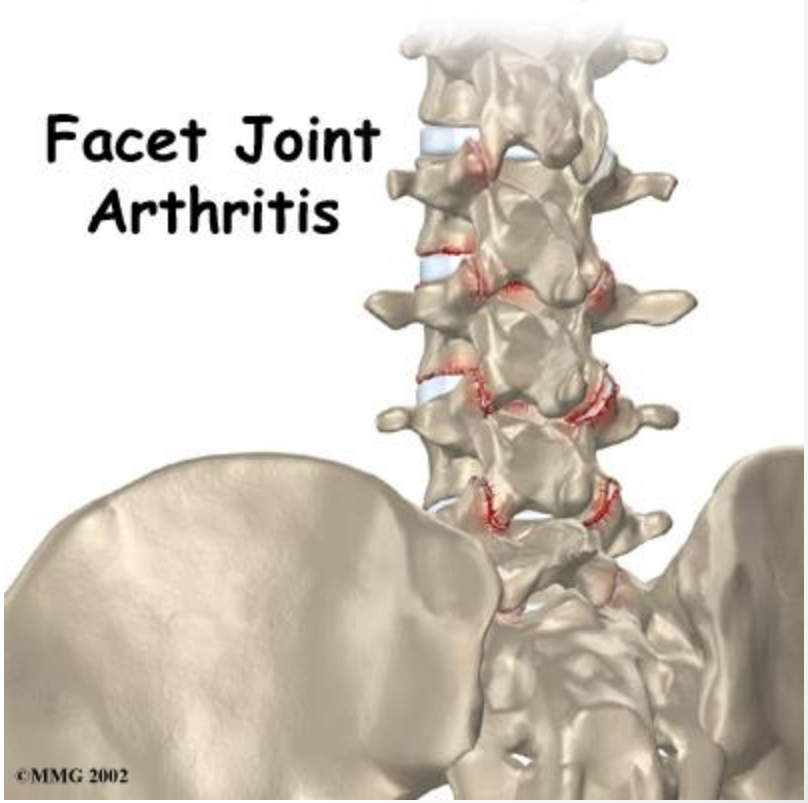
By placing pt on table prone you are encouraging centralization of the nucleus.



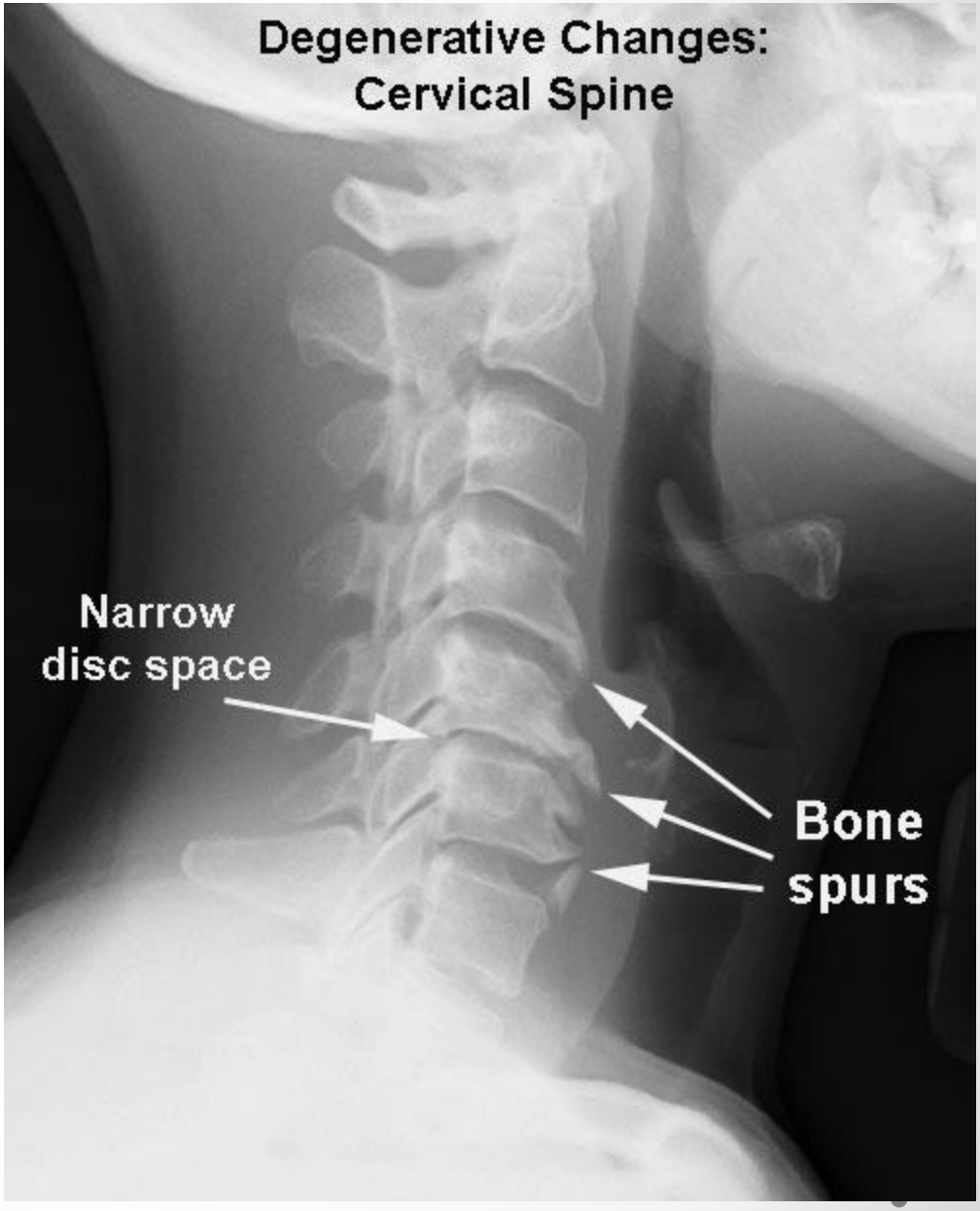
Facet joints



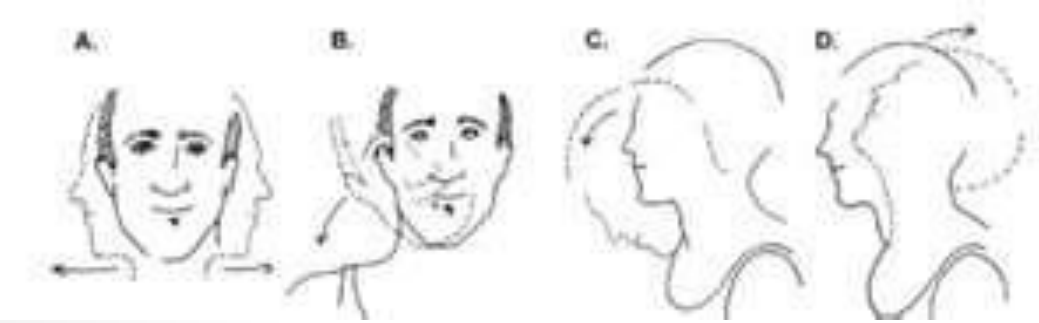




Cervical Disc Disease



Cervical ROM



Perform AROM then PROM then Resistive ROM on the area that patient feels discomfort.

Shoulder depression test

Indication for Dural Sleeve adhesions.

NOTE: If patient produces sharp pain then they may not be able to tolerate traction/decompression

Cervical compression

Positive produces local pain and or radiculating pain.

Consider nerve encroachment

Cervical distraction test

If relieves symptoms of pain and or radiculopathy consider nerve root compression syndrome.

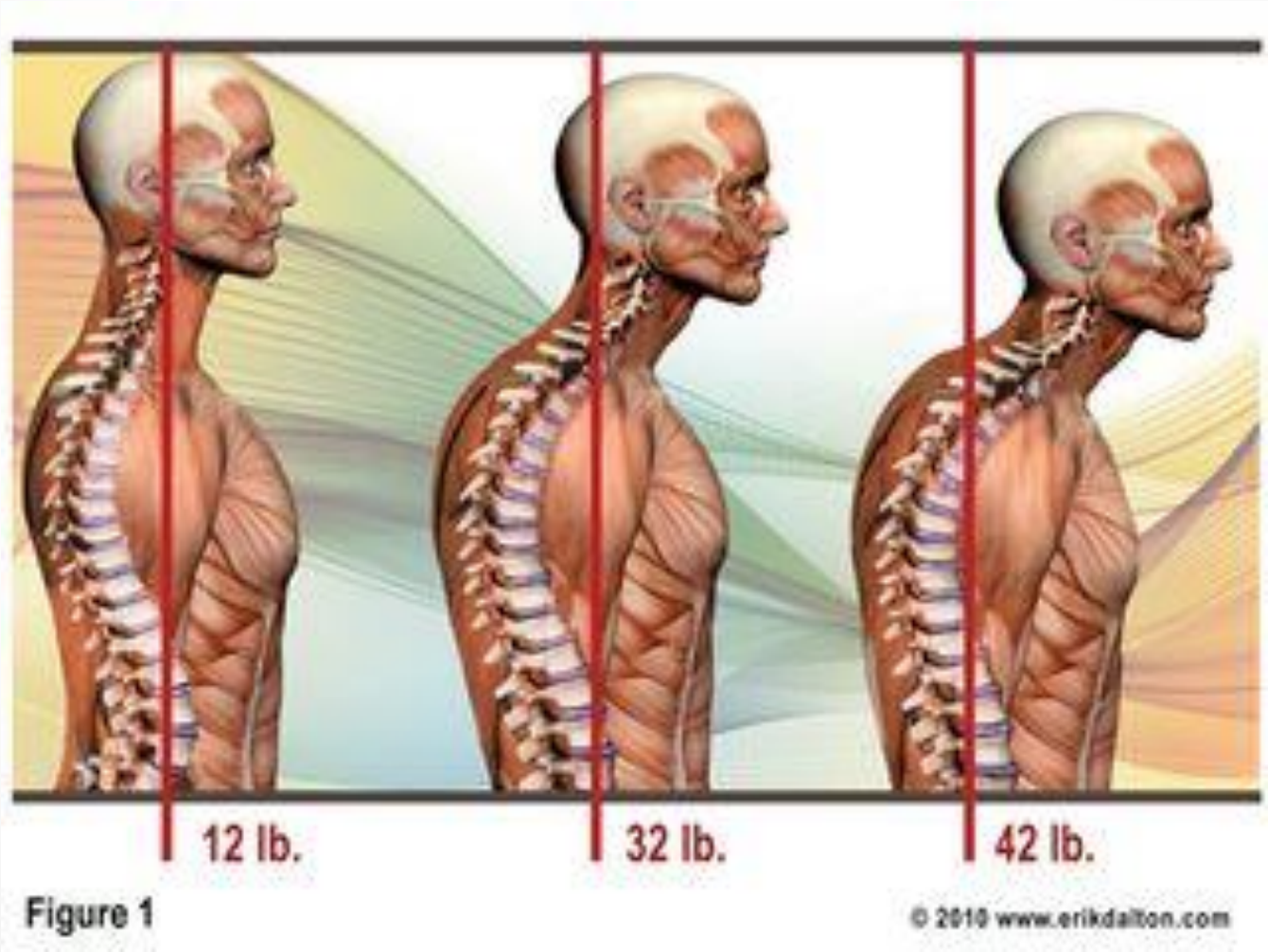
If this is positive this is a good indicator that cervical traction/decompression will aide the patient.

Jacksons Compression

This is pos if pain is produced on the flexed side of the neck.

Indicates IVF stenosis, facet(Uncovertebral joints), and/or nerve root encroachment

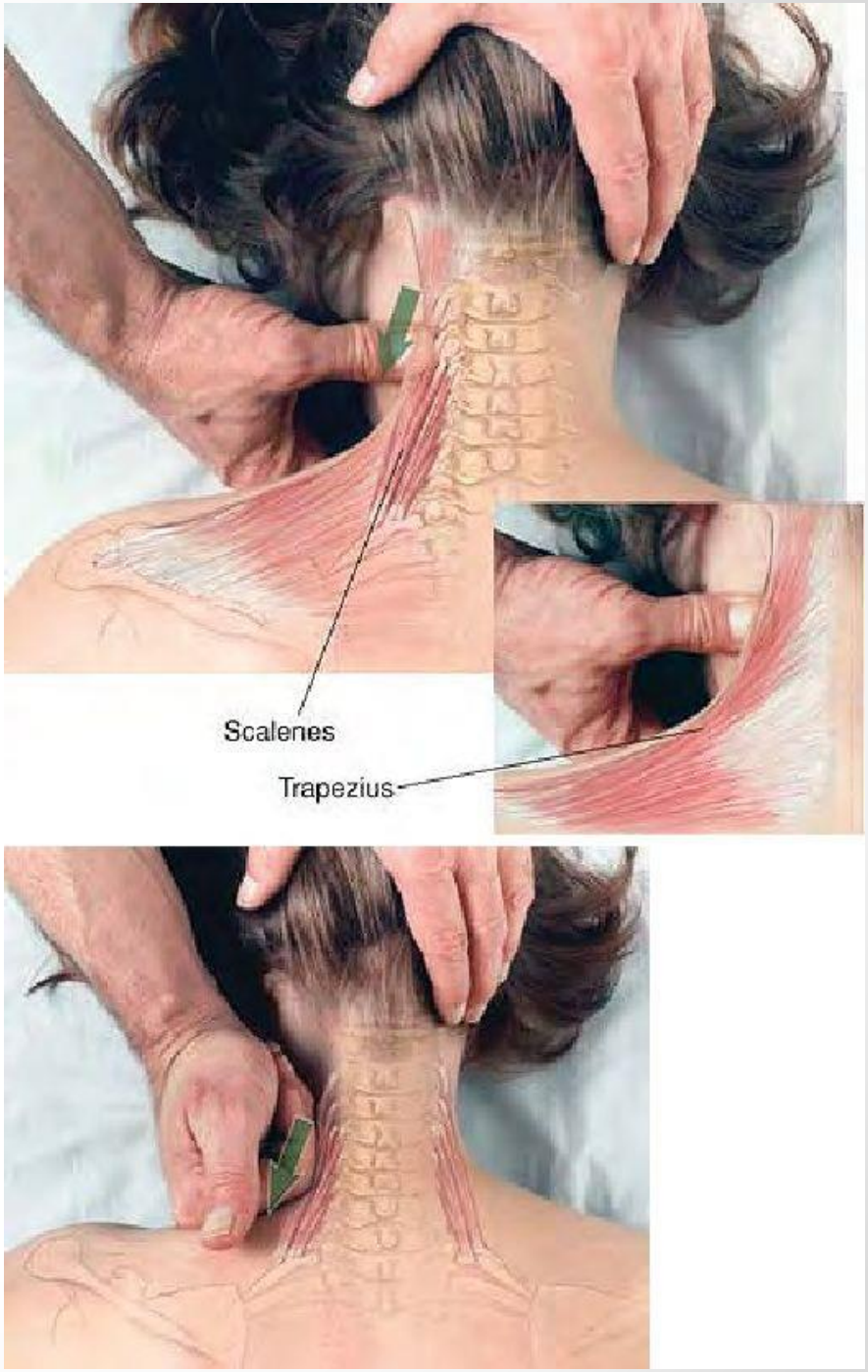
Forward Head Posture

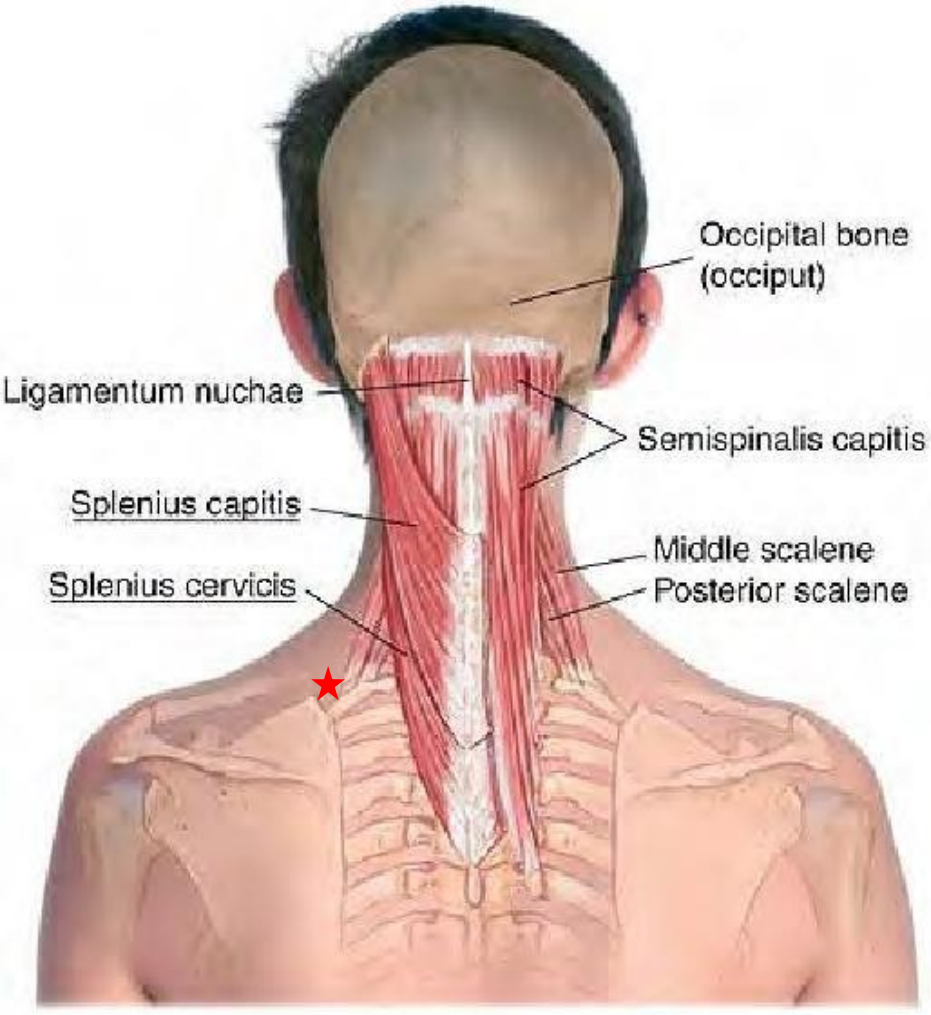


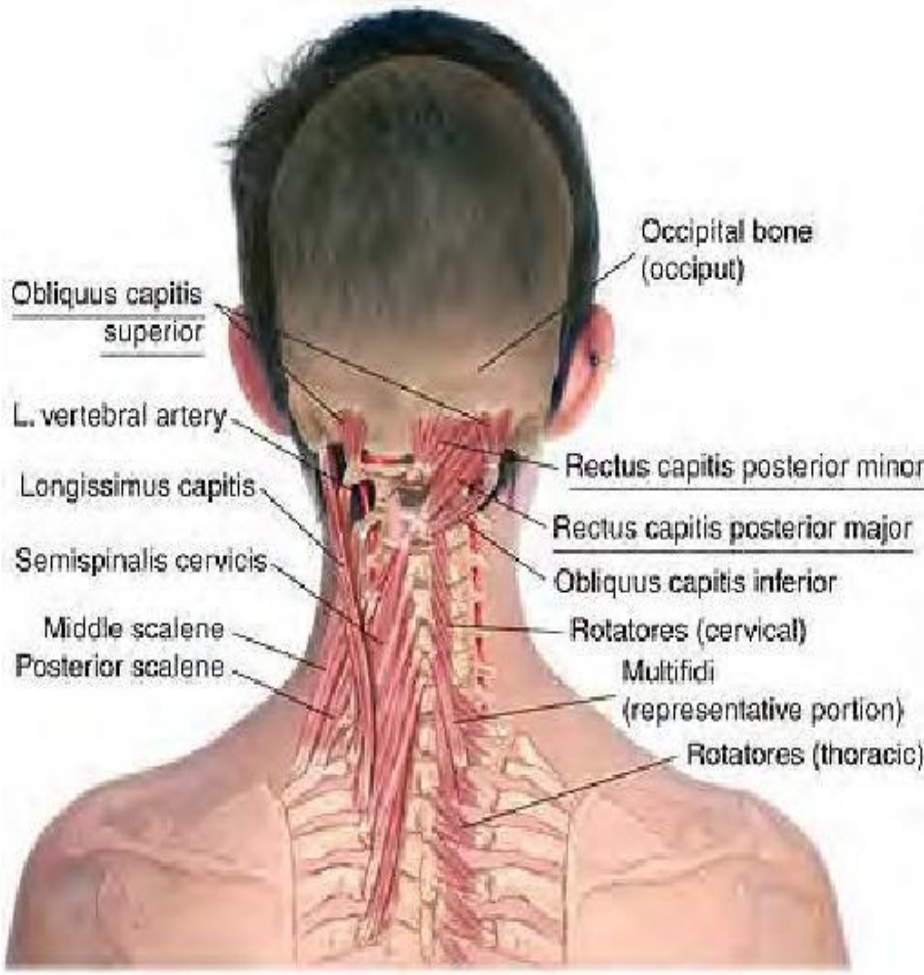
Normal Curve

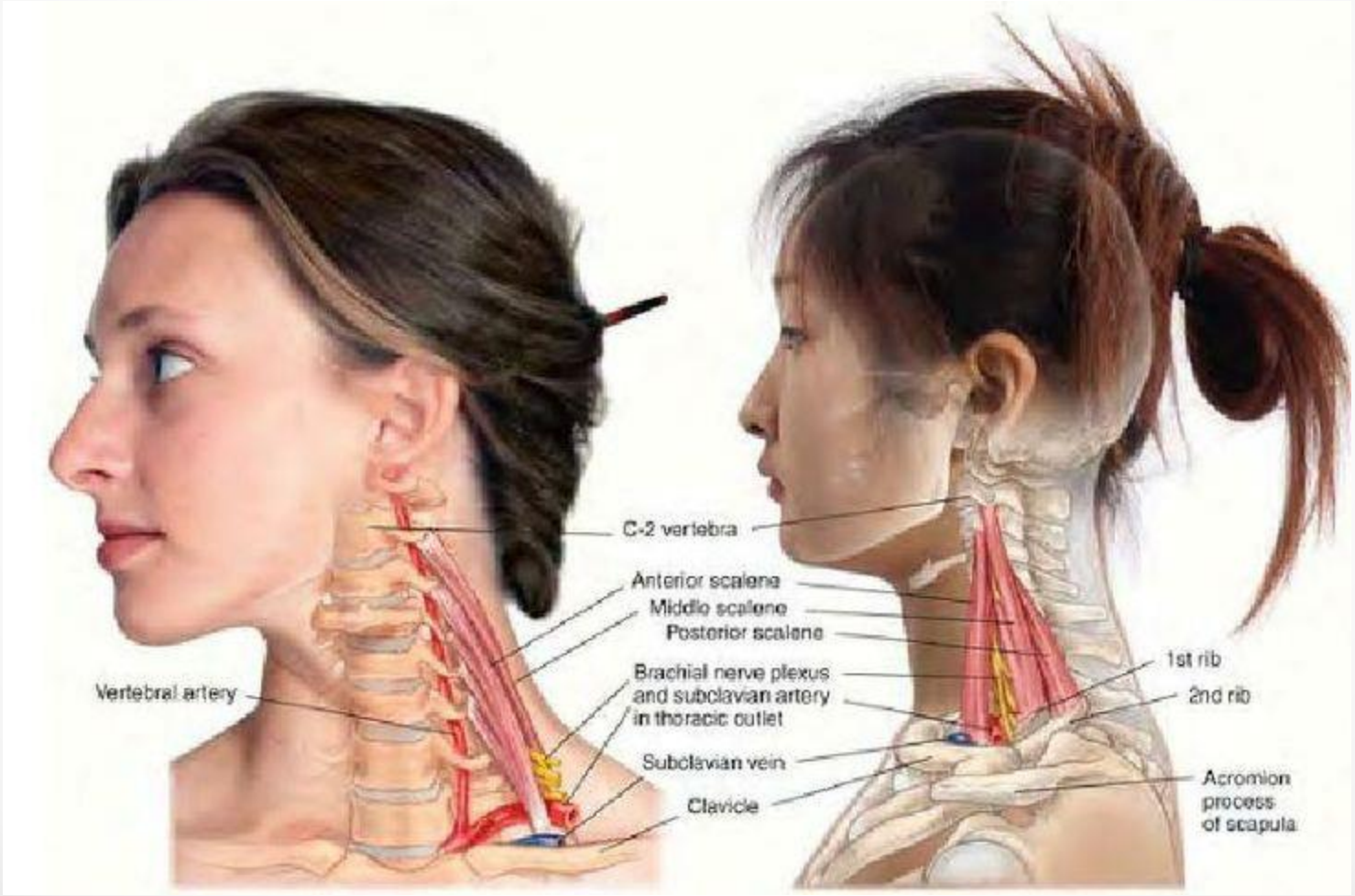
Reversed Curve

Cervical disc

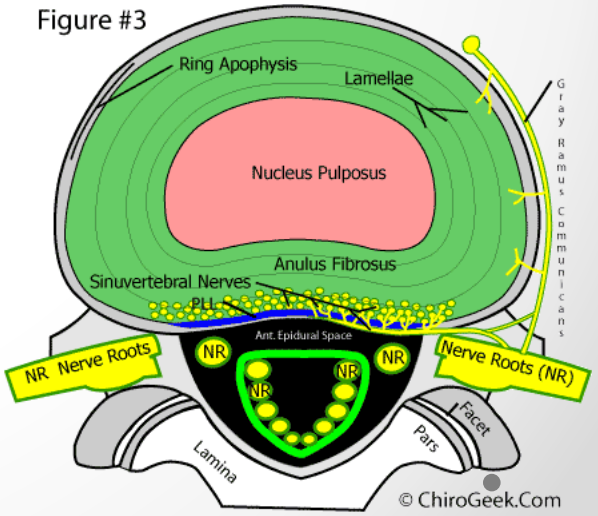








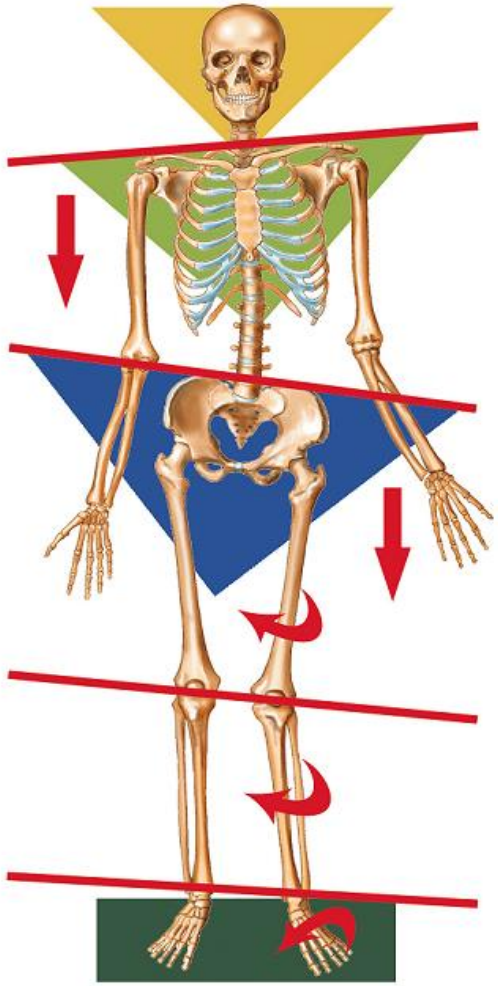
Twisting



Clinical Pearls

- Cervical Deflection
- Abdomen bolster if prone
- Fetal position
- Legs bent if supine
- Getting up off table
- No torsion

Look for the Root cause



Treatment Plan

- Depending on client profile
- At home HEP
- Typical Tx plan on generic disc

  2x/week for 3 weeks,

  1x/week for 2 weeks

  2x/month for 1 month

  1x/month for 6 months

2 mo Acute Care plan

6 mo Maintenance Care

Final thought

- A standard rule of caution should be that anything that further aggravates the client's neurological symptoms should be immediately stopped. As usual, if it is at all possible to get further clarification of the exact nature of the problem from a physician you should definitely try to do that. Massage therapy can be a valuable adjunct treatment for clients with disc herniations, so the more you know about this condition the more effective relief you can provide your clients.

The End

- **Notes**
- **Recording**
- **Certificates**
- **Questions** www.info@clublmt.com
- **Website** www.clublmt.com