

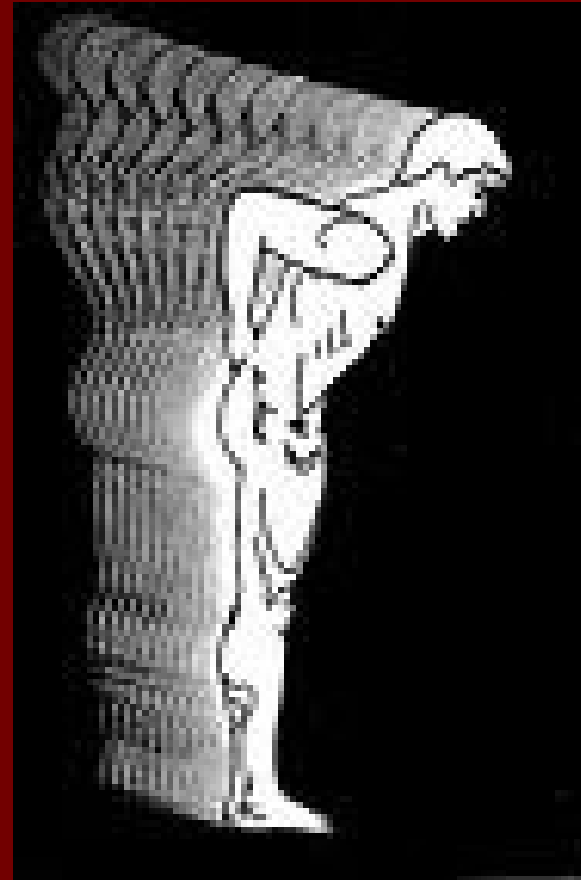
BACK EVALUATION

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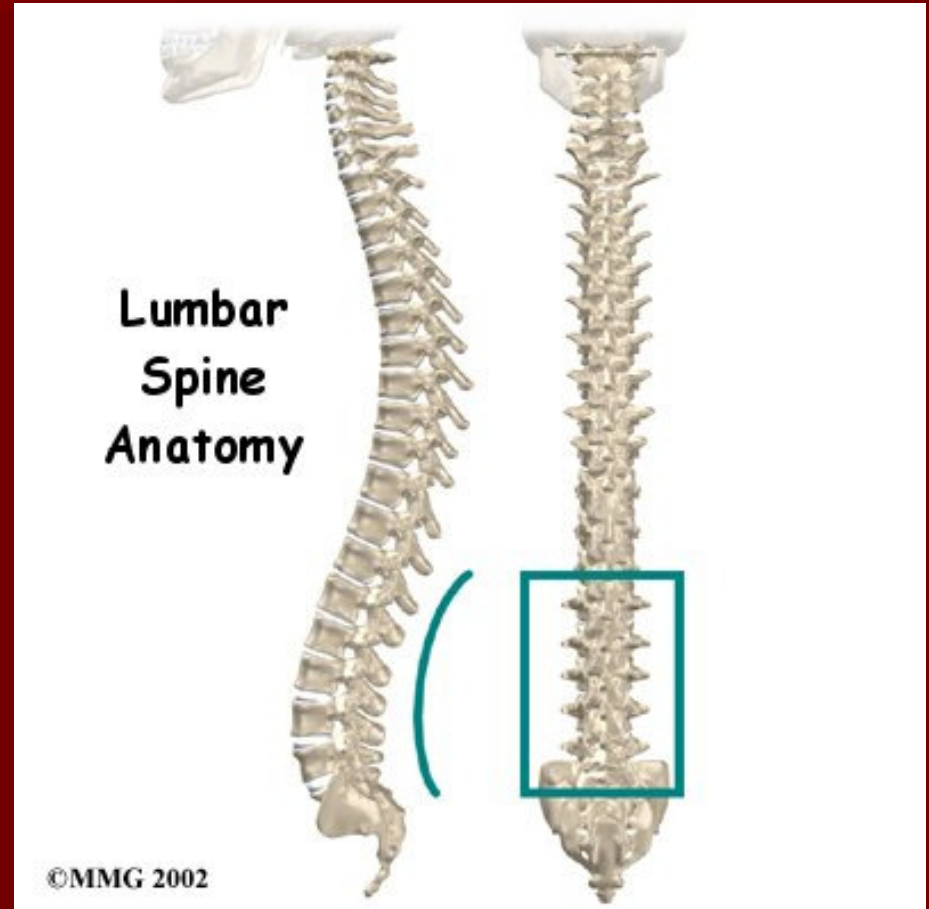
RELEVANCE

- Low back problems affect everyone at some time in their life
- Yearly prevalence of 50% of working adults
- 15-20% seek medical care
- Fifth most common of PCP visits



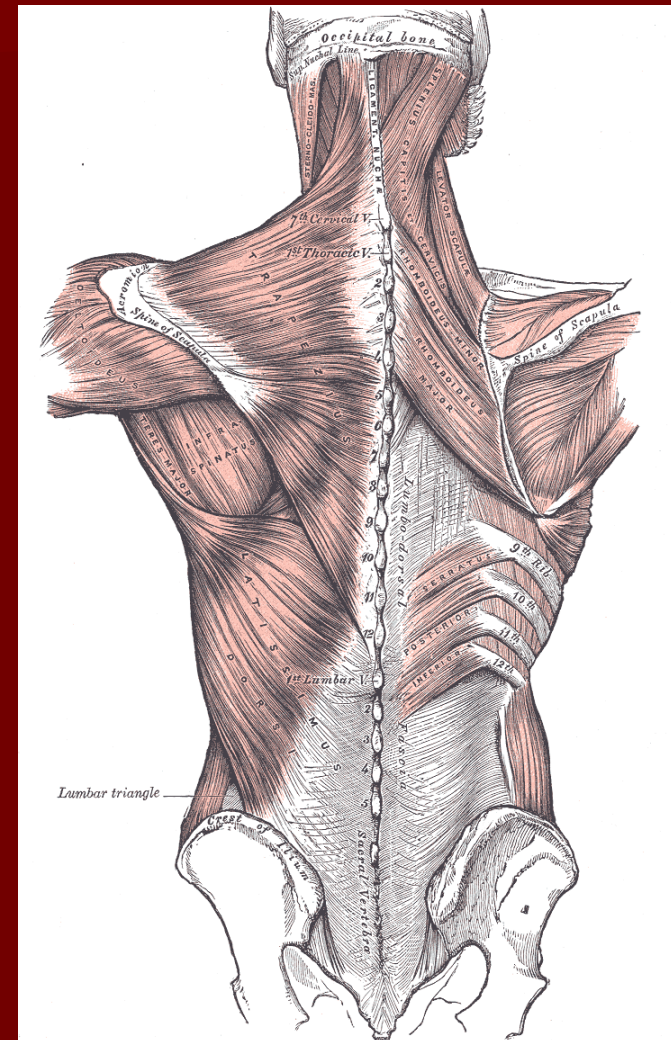
ANATOMY

- Spine
 - 5 Lumbar Vertebrae
 - Sacrum
 - Intervertebral discs
 - Spinal cord
 - Nerve roots



ANATOMY

- Muscles
 - Latissimus Dorsi
 - Erector Spinae
 - Iliocostalis, Longissimus, Semispinalis
 - Quadratus Lumborum
 - Iliopsoas



"S's" of the Spine

- ***Spondylolysis***
 - Pars interarticularis
 - "Scottie dog"
- ***Spondylolisthesis***
 - Slippage of one vertebral body over another
- ***Scoliosis***
 - Curvature of spine
- **Spinal Stenosis**
 - Narrowing of spinal canal



HISTORY

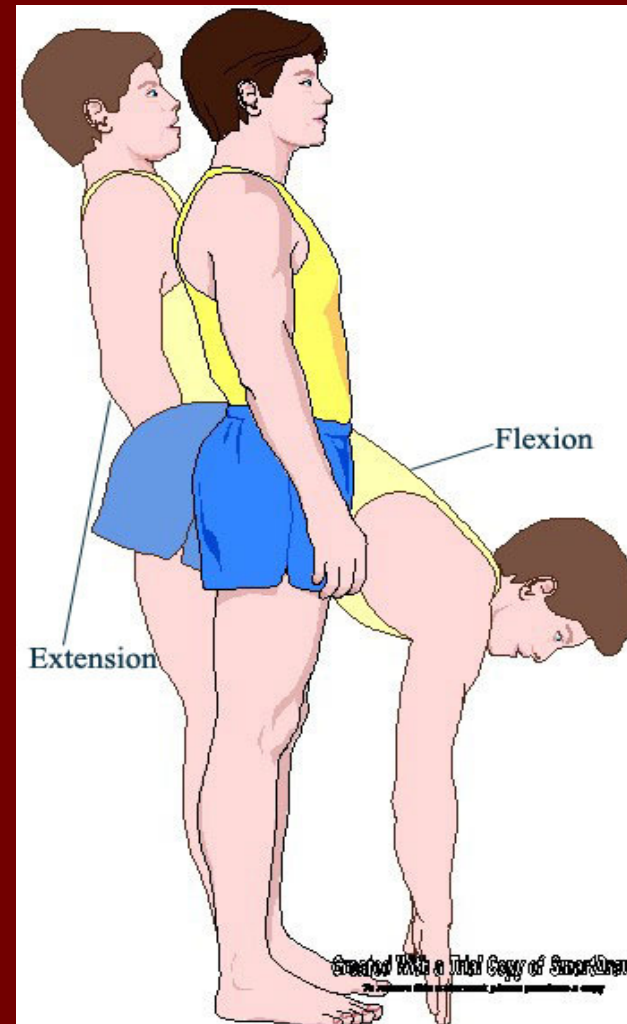
- Acute (<6 wks)
 - MVA, Fall, Lifting, Twisting
- Subacute (6-12 weeks)
 - Repetitive motion
 - Posture
- Chronic (months/years)
 - Workman's comp, secondary gain
 - Myofascial pain vs. organic etiologies
 - Degenerative joint disease of the spine



HISTORY

- ***Flexion-Based***

- Lumbar radiculopathy
- Discogenic
 - Ruptured annulus fibrosis



HISTORY



■ ***Extension based***

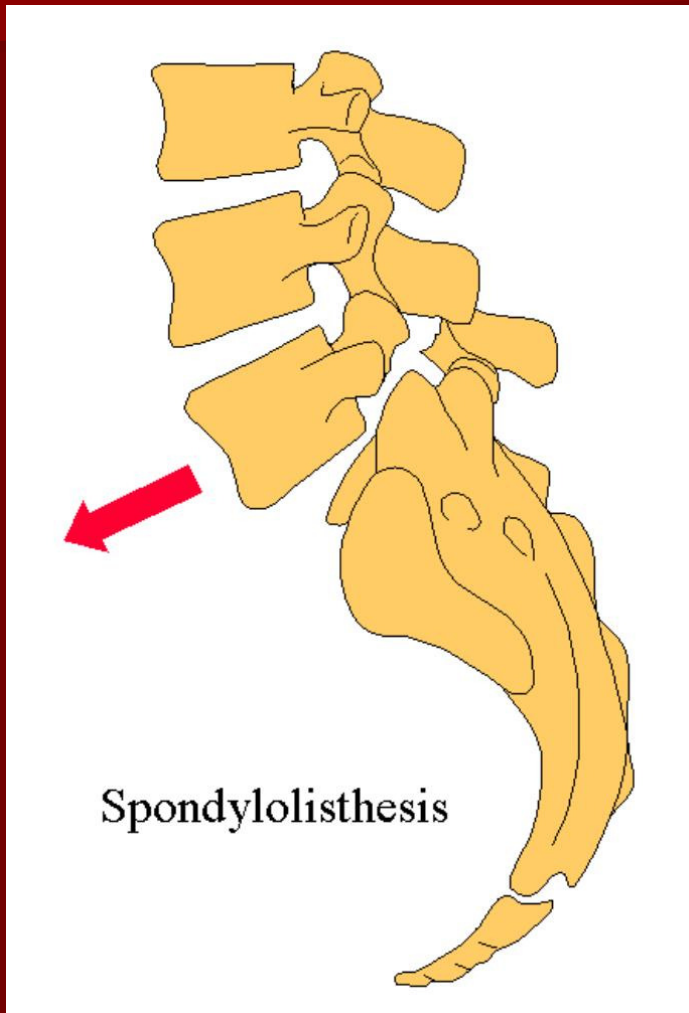
- Spinal Stenosis
- Spondylolysis
- Spondylolisthesis
- Facet Syndrome

HISTORY



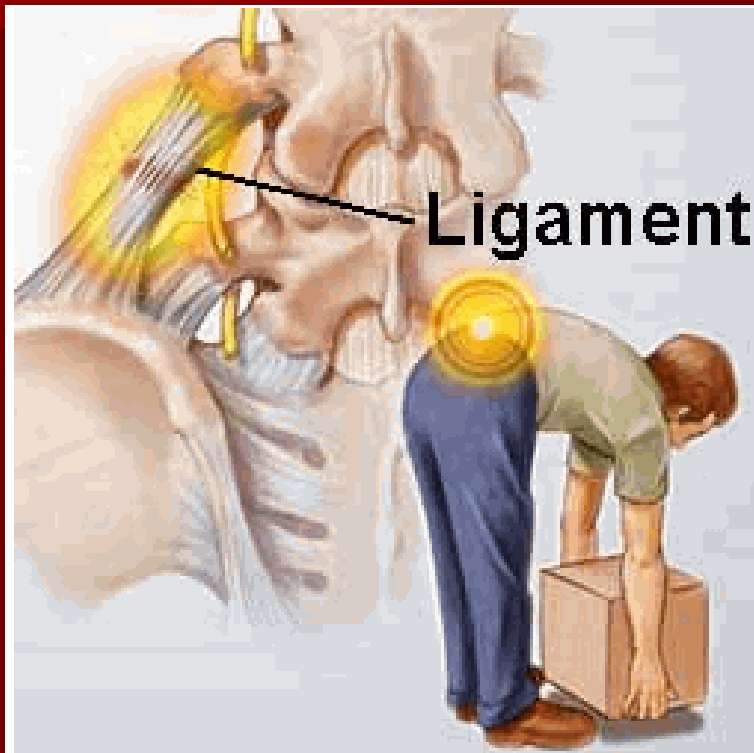
- ***Either (Flexion and/or extension)***
 - Muscular (myofascial)
 - Mechanical LBP
 - Sacroiliac (SI) joint
 - Osteoarthritis

AGE



- Age <20
 - Pars interarticularis stress fx
 - Spondylolisthesis
 - Scoliosis
 - Muscular
 - SI joint

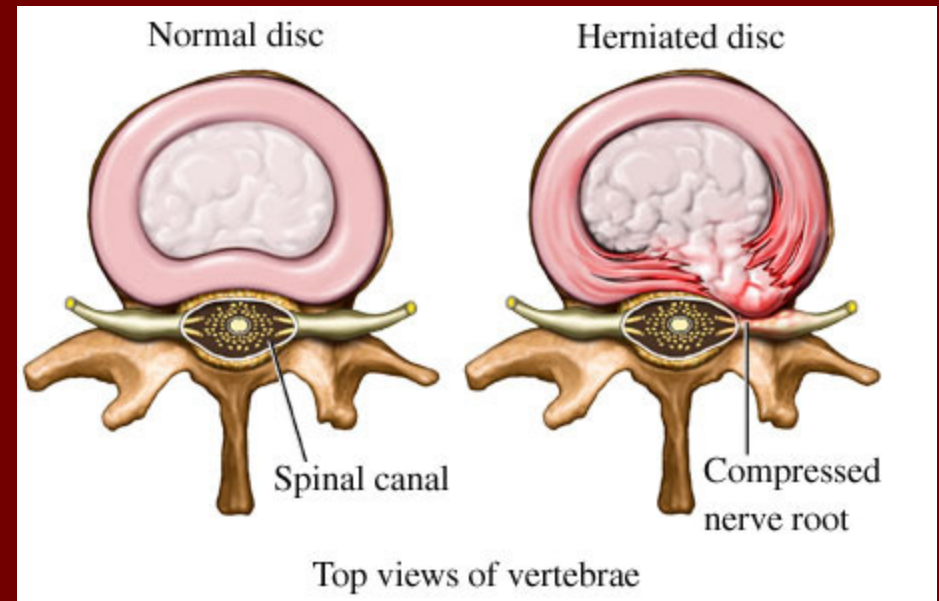
AGE



- Age 20-50
 - Muscle strain (myofascial)
 - Mechanical LBP (inflexibility/imbalance)
 - Herniated disc
 - Sacroiliac
 - Facet syndrome

AGE

- Age >50
 - Herniated disc
 - Mechanical LBP (inflexibility/muscle imbalance)
 - Spinal Stenosis
 - Osteoarthritis
 - Facet arthropathy
 - Spondylolisthesis (degenerative)
 - Compression fractures

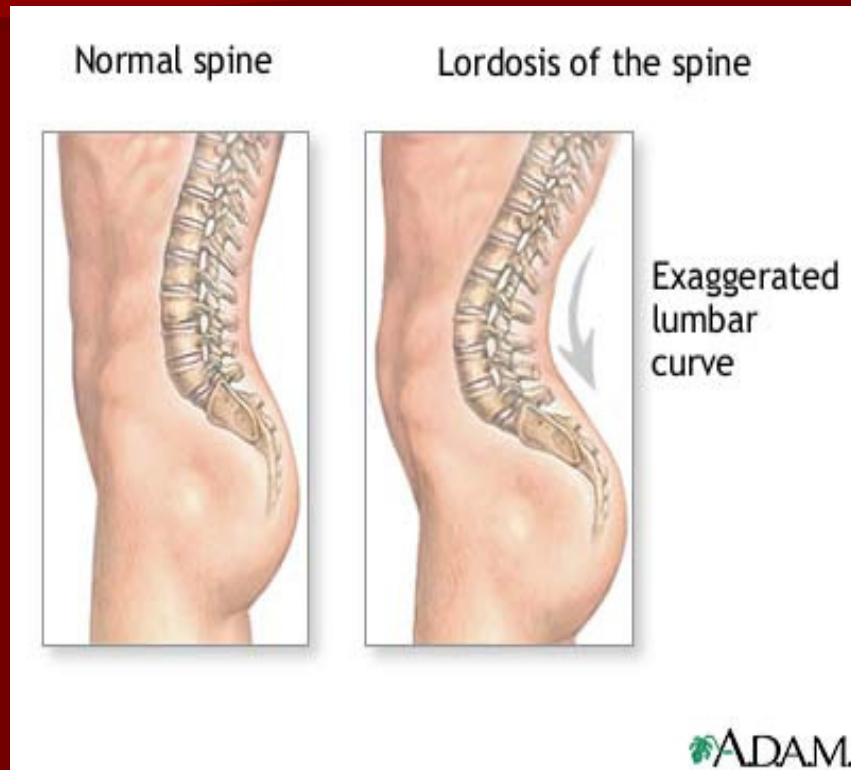


RED FLAGS

- **Age >50 or <20**
- **History of cancer, weight loss and/or night pain**
 - Tumor
- **Bowel/bladder probs or saddle anesthesia**
 - Cauda equina
- **Weakness**
 - Worsening radiculopathy
- **Fever/chills**
 - Osteomyelitis
 - Pyelonephritis
- **Stiffness (Bamboo spine)**
 - Inflammatory
 - Ankylosing spondylitis



PHYSICAL EXAM



■ **Posture**

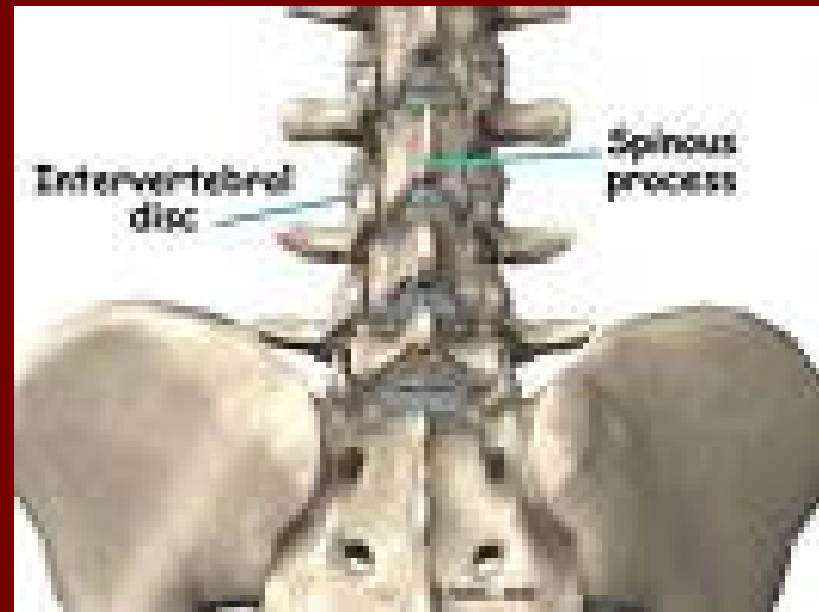
- Lumbar lordosis
- Pelvic Height
- Lumbopelvic rhythm

■ **ROM**

- Flexion/Extension
- Rotation
- Sidebending
- Severe guarding in all planes is a red flag

PALPATION

- Spinous processes
- Sacroiliac joints
- Paraspinal muscles
- Piriformis/Gluteus medius



NEUROLOGIC EXAM



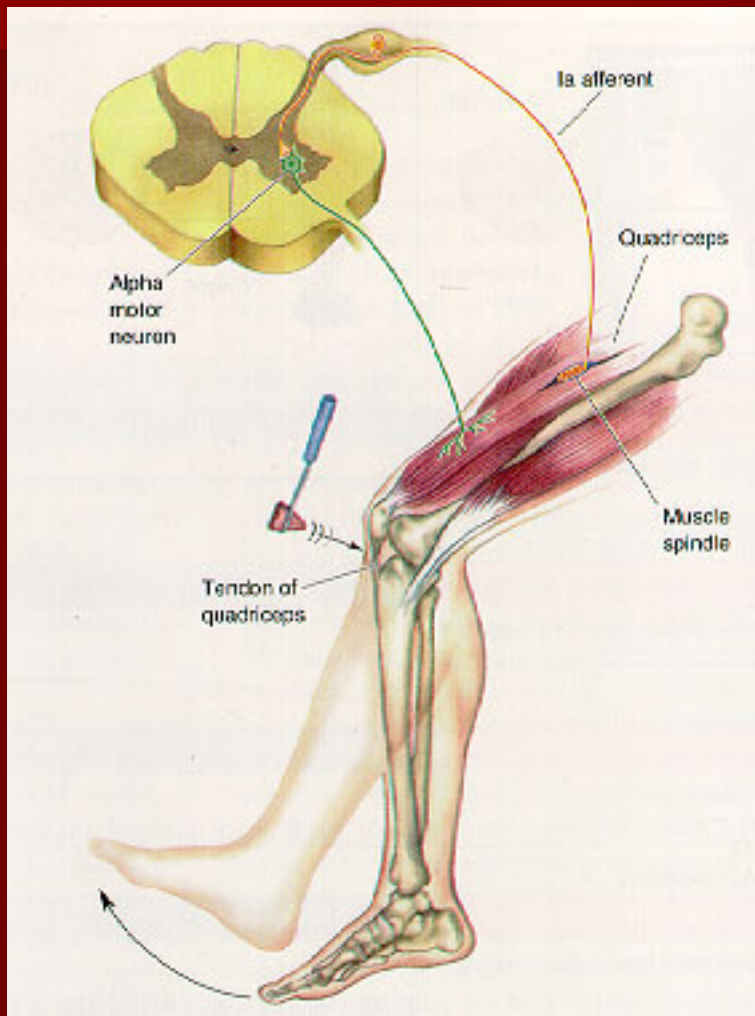
■ ***Gait***

- Heel (L5)
- Tip Toe (S1)

■ ***Strength***

- Hip flexion (L1)
- Hip abduction (L2)
- Quadriceps (L3)
- Anterior tibialis (L4)
- FHL/Abduction hip (L5)
- Plantar flexion/Eversion (S1)

NEUROLOGIC EXAM



■ ***DTR's***

- Knee (L4)
- None for L5
- Ankle/Achilles (S1)

■ ***Sensation***

- L4 – medial foot
- L5 – dorsal foot
- S1 – lateral foot

PROVOCATIVE TESTING

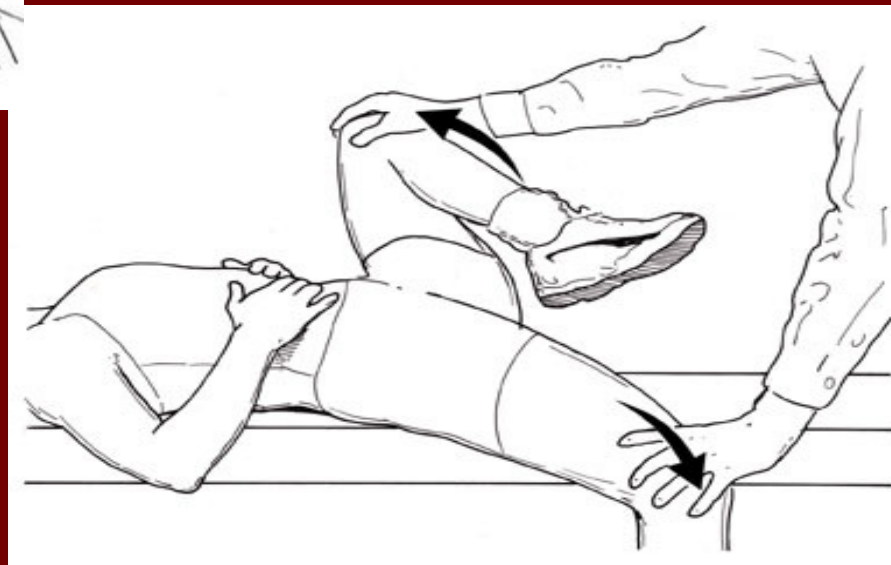
- ***One leg hyperextension***
 - Spondylolysis
- ***Straight leg raise or slump test***
 - Supine/seated
 - Neural tension
 - Discogenic/radiculopathy
 - Pain below the knee at less than 70 degrees of flexion and aggravated by dorsiflexion most suggestive
 - Crossover pain is a stronger indication



PROVOCATIVE TESTING



- **FABER's**
 - Hip or SI Joint
- **Gainslen's**
 - SI Joint



WADDEL'S SIGNS

- Superficial, nonanatomic tenderness
- Inconsistent responses – positive straight leg raise, but negative slump test
- Nondermatomal sensory loss
- Over-reaction
- No effort



IMAGING

- In the absence of red flags, no imaging necessary initially
- 90% resolve spontaneously in 4-6 weeks
- Imaging studies on “normal” asymptomatic people are commonly abnormal



INDICATIONS FOR IMAGING

Possible cause	Features on H & P	Imaging	Additional studies
Cancer	Wt loss	Xray	ESR
	Age >50 >4-6 wks H/O cancer	MRI	
Vertebral infection	Fever IVDA Rec. infxn	MRI	ESR/CRP
Ankylosing spondylitis	Stiffness Young	Xray	HLA-B27 ESR/CRP

INDICATIONS FOR IMAGING

Possible cause	Features on H & P	Imaging	Additional studies
Cauda equina syndrome	Urinary ret Fecal incont Saddle anes	MRI	None
Comp. fx	osteoporosis Steroid use Older age	Xray	None
Severe/prog neuro deficits	Progressive motor weakness	MRI	Consider EMG/NCV

INDICATIONS FOR IMAGING

Possible cause	Features on H & P	Imaging	Additional studies
Herniated disc	Sxs >4 wks back pain + leg pain in L4, L5 or S1 dermat	MRI	Consider EMG/NCV
Spinal stenosis	Sxs >4 wks leg pain relieved by flexion	MRI	Consider EMG/NCV

MANAGEMENT



- ***Pain Control***

- Tylenol

- NSAIDS

- Muscle relaxants

- Opioids

- Antiepileptics

- ***Therapy based on diagnoses:***

- Flexion based pain

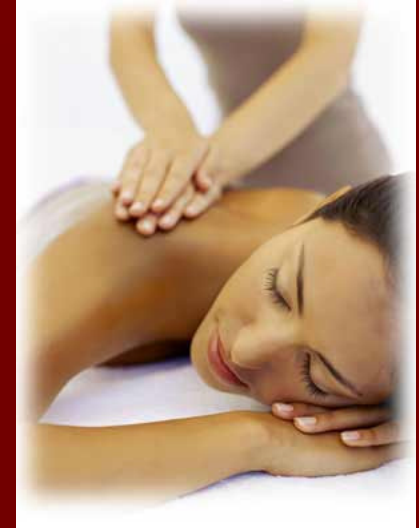
- centralize pain with extension program (McKenzie)

- Extension based pain

- William's flexion exercises

MANAGEMENT

- Avoid bed rest
- Heat/cold
- Spinal manipulation
- Massage therapy
- Proper lifting mechanics
 - Hold close to body at level of navel
 - No twisting/bending/reaching while lifting
- Ergonomics
 - Soft support for small of back, arm rests, etc
- Acupuncture



EVIDENCE FOR ACUTE LBP NONPHARMACOLOGIC EFFICACY

- Heat
- Spinal manipulation



EVIDENCE FOR SUBACUTE LBP NONPHARMACOLOGIC EFFICACY

- Intensive interdisciplinary rehabilitation
- Exercise therapy
- Acupuncture
- Massage therapy
- Spinal manipulation
- Yoga
- Cognitive-behavioral therapy
- Progressive relaxation



WORK RESTRICTIONS

	Severe	Moderate	Mild	No sxS
Amount of time sitting	20 min	30 min	40 min	50 min
Lifting for men	20 lbs	20 lbs	60 lbs	80 lbs
Lifting for women	20 lbs	20 lbs	35 lbs	40 lbs

COMMON DIAGNOSES

■ **Discogenic**

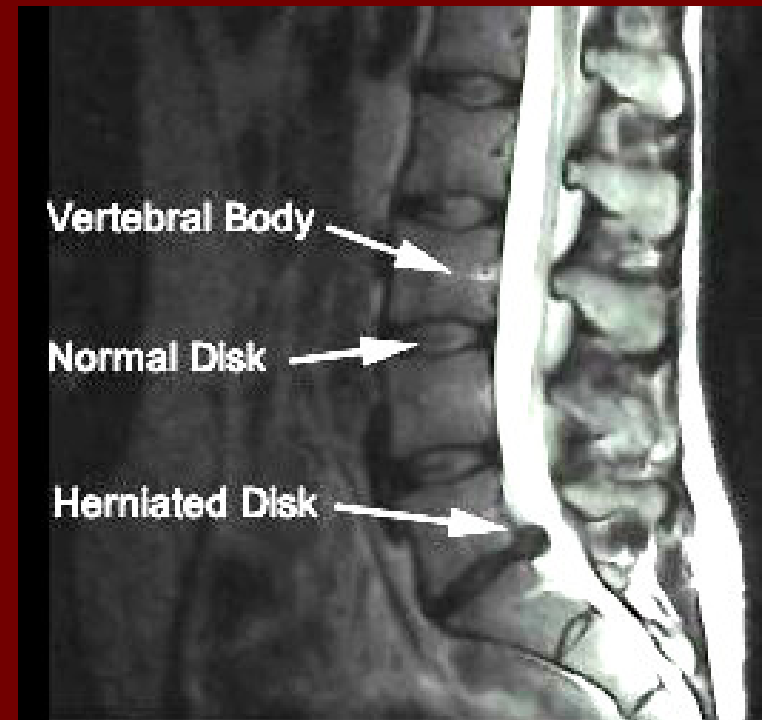
- Flexion based pain
- Leg pain > back pain if radicular

PE

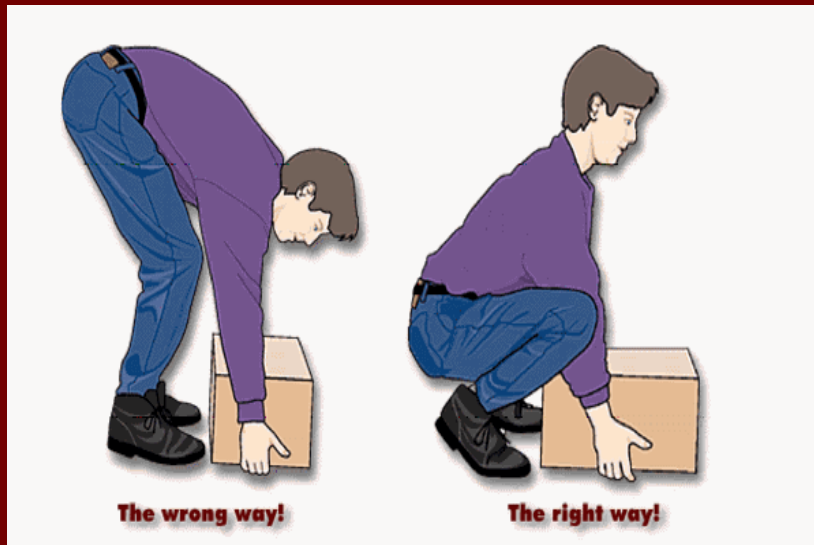
Flexion pain
+ SLR, +/-neurologic

Rx

PT: McKenzie exercises
Steroids/NSAIDs/antiepileptics
Epidural steroids for leg pain
Surgical decompression



MUSCULAR/MECHANICAL LBP



■ **History**

- Stiffness in all planes
- +/- h/o trauma

■ **PE**

- Paraspinal muscle spasm
- Inflexibility
- NI provocative testing

■ **Rx**

- PT for core strengthening and teach proper posture & lifting mechanics
- NSAIDs/muscle relaxants

SACROILIAC JOINT



FIGURE 1. Posterior pelvic pain provocation test. With the patient supine, the hip flexed to 90°, and the knee bent, the examiner applies posterior shearing stress to the sacroiliac joint through the femur, using one hand to thrust and one to stabilize. Proper positioning avoids pain from excessive adduction of the hip. The test is positive if it provokes back or buttock pain.

■ **History**

- Twisting/torque
- +/- trauma
- Deep, vague back or pelvic pain

■ **PE**

- No pain above L5
- NI ROM, neurologic
- + FABER's/Gainslen's

■ **Rx**

- NSAID's
- PT: pelvic stabilization and core strengthening
- Manipulation
- SI Joint injections

PARS STRESS FRACTURE

- **History**

- Repetitive hyperextension
 - Adolescents

- **PE**

- + 1-leg hyperextension
 - NI neurologic, strength

- **Rx**

- Limit extension activity
 - Bracing
 - PT (spinal stabilization)



SPINAL STENOSIS



■ **History**

- Extension pain
- Pain with walking, relieved by rest/flexion

■ **PE**

- Flexed posture
- +/- neurologic exam

■ **Rx**

- Steroids/NSAIDs/antiepileptics
- Flexion based therapy
- Transforaminal/selective injections (flouroscopy)

FACET SYNDROME

■ **History**

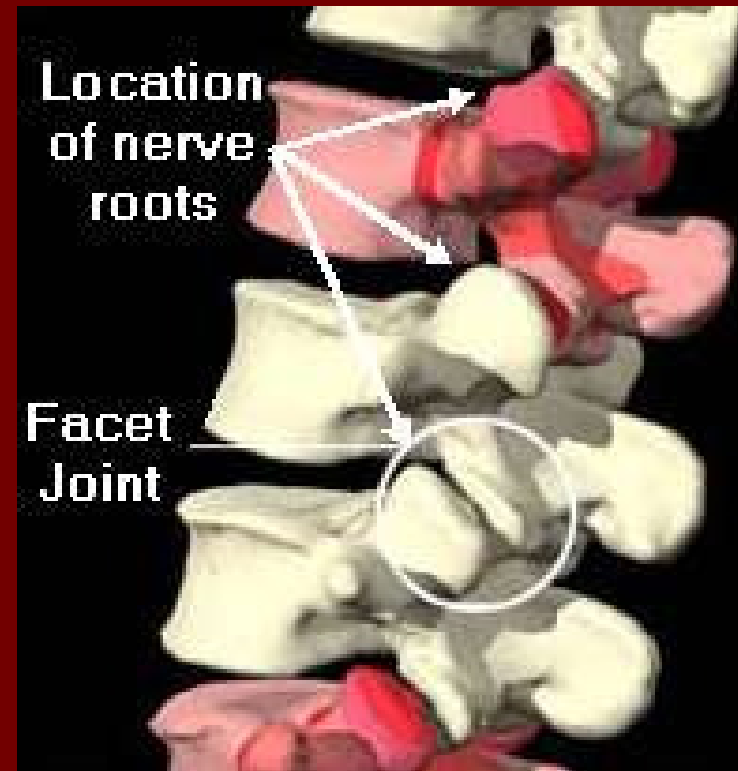
- Extension based pain
- No leg pain

■ **PE**

- Pain with extension
- NI neuro, strength
- NI provocative testing

■ **Rx**

- NSAIDs
- Flexion based therapy
- Facet injections
(flourosocopy)



MANIPULATION

- Pelvic obliquity
- SI joint pain
- Mechanical low back pain
- Muscular tension
- Scoliosis
- Postural pain



SOFT TISSUE

- Palpate spinous processes
- Place thenar and hypothenar eminences of dominant hand just lateral to spinous processes with other hand on top used as support
- Press down first and then gently push laterally
- Repeat this the length of the lumbar and thoracic spine on both sides

COUNTERSTRAIN

- Find a tender point in the low back
- Keep one finger on the point
- Use your other hand to shorten the muscle by elevating the leg
- Move the leg into different positions while monitoring the point to feel where it is the least tense
- Hold for 1-2 minutes and monitor for release

MUSCLE ENERGY

- Place thenar and hypothenar eminences of one hand just superior to the ilium on the side that you are standing on.
- Use your other hand to extend the leg on that side to the natural barrier
- Then have patient push down towards the table for 3 seconds
- Relax for 1 second and extend the leg further to the new barrier
- Repeat 3 times

THANK YOU!!
QUESTIONS?

