# BACK PAIN

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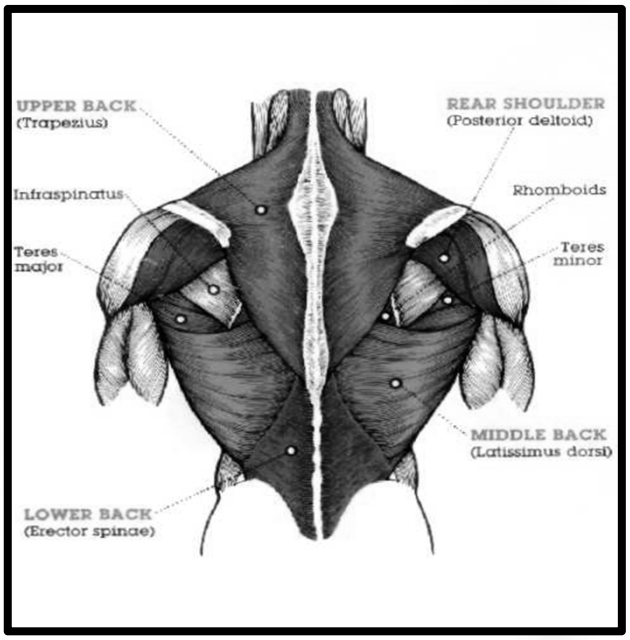
## EPIDEMIOLOGY

***Back pain is the #2 complaint in primary care!***

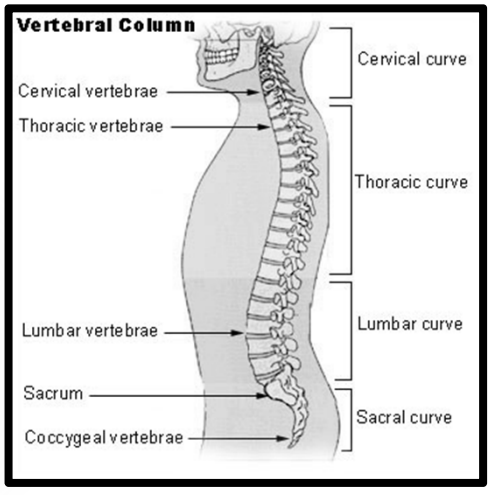
- Low back pain is the fifth most common reason for all physician visits in the United States
- 2%-8% of Americans suffer from chronic low back pain (CLBP)
- 1% of working population in US is completely disabled due to CLBP
- Lifetime prevalence 60-90%
- > 85% = no identifiable cause

- **$50 BILLION** spent ***annually*** on low back pain management

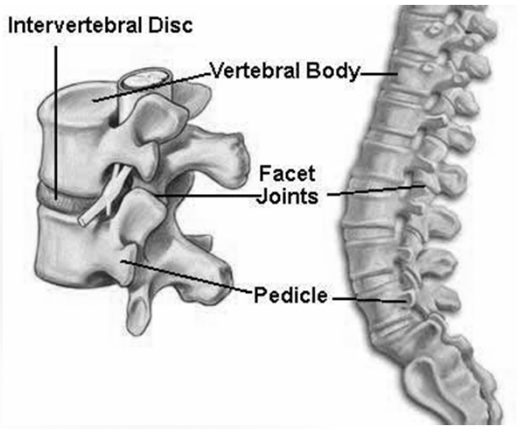
# ANATOMY:

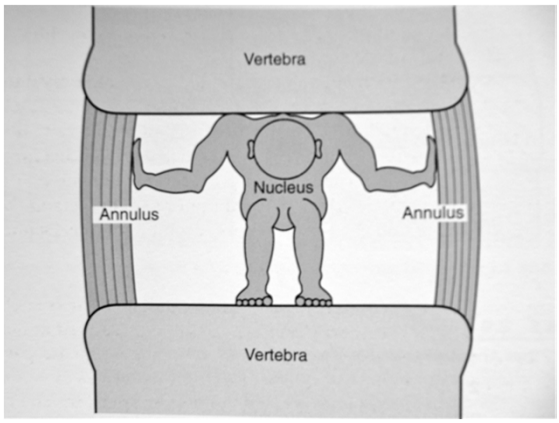



# Vertebral Column



# Vertebrae and Disc

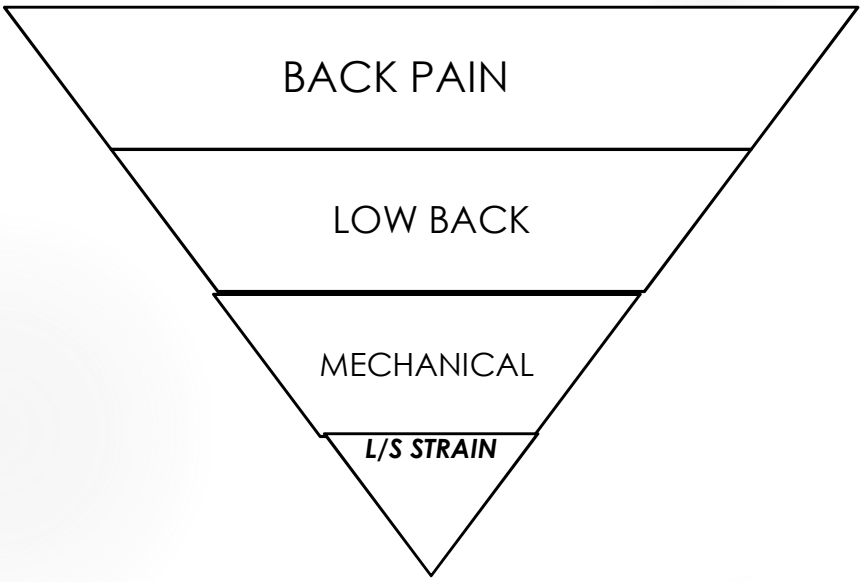



# Low Back Pain

# Causes of Low Back Pain (LBP)

| ***Mechanical Origin 97%*** | Non-Mechanical 1% | Visceral Disease 2% |
|---|---|---|
| Lumbar sprain/strain 70% | Neoplasm < 1% | Aortic aneurysm |
| Degenerative disc or facet disease 10% | Infection 0.01% | Renal Disease |
| Herniated Disc 4% | Inflammatory Disease <1% | Pelvic Disease |
| | | Abdominal Disease |



# Lumbosacral Strain

***" MY BACK WENT OUT"***

- Typical chief complaint is sudden severe back pain that felt like a tearing or giving way. May radiate into buttock and upper posterior thigh
- May be a single precipitating event with immediate onset of pain; may be culmination of events
- Torn paraspinal muscle fibers or ligaments

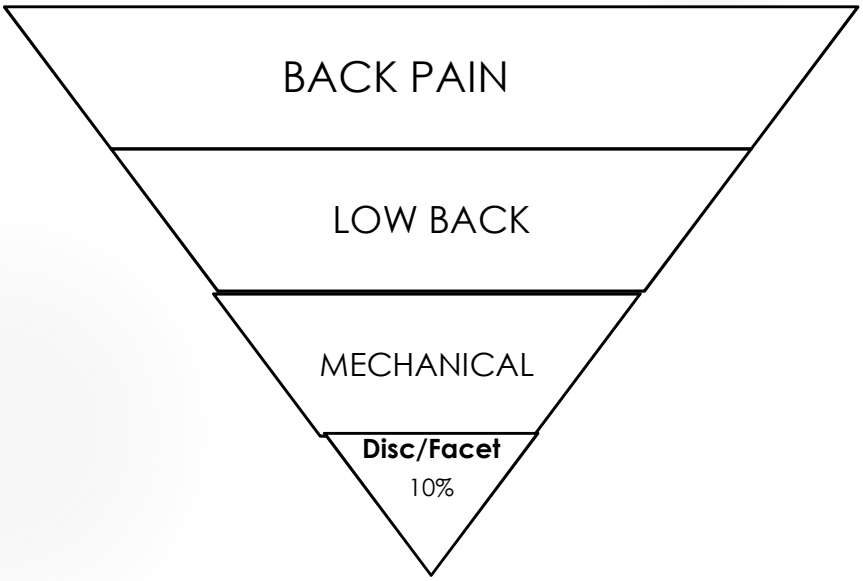
# LS STRAIN

**HPI**

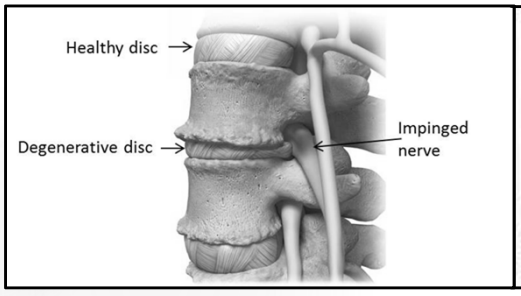
- Single event or culmination
- Lumbosacral regional
- Usually constant, severe pain
- Aching to sharp and stabbing
- Aggravated by sitting
- Some relief with lying supine

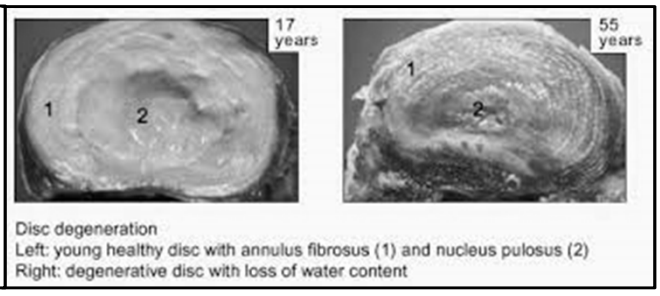
**Physical Examination**

- Loss of LS curve
- Paraspinal muscle tenderness
- Muscle spasm, often at L3-L4
- Decreased lumbosacral flexion and lateral bending
- Neurologic exam normal




# Degenerative Disc Disease (DDD)




Disc degeneration
Left: young healthy disc with annulus fibrosus (1) and nucleus pulosus (2)
Right: degenerative disc with loss of water content

# DDD

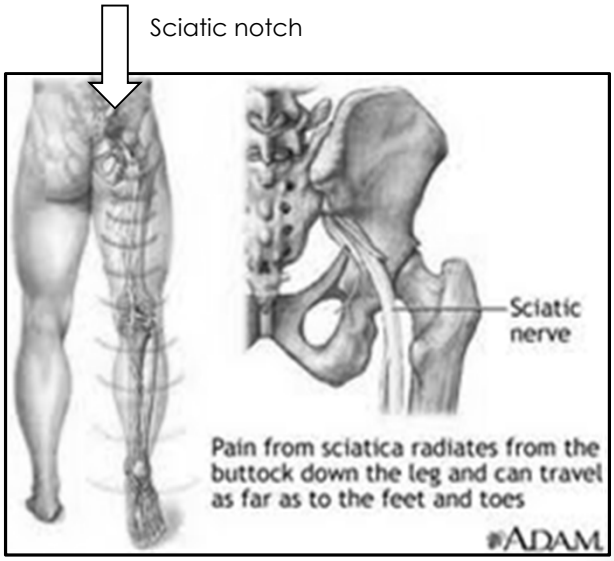
**HPI**

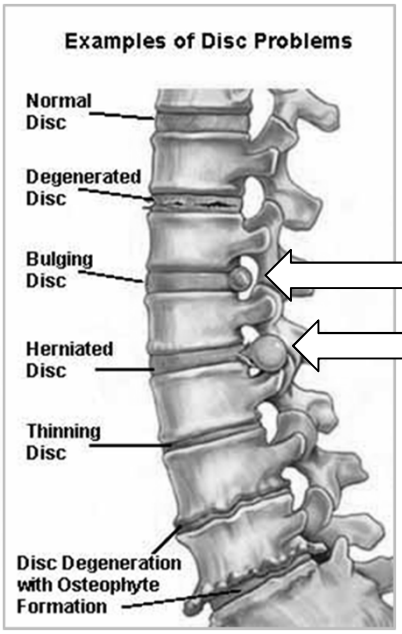
- Intermittent periods of low back pain
- Early = Pain aggravated by prolonged sitting
- Later = May become radicular with advanced degeneration/nerve root compression = ***Sciatica***
  - Posterior/lateral thigh to ankle/foot
  - Sharp/burning pain
  - Worse with cough/Valsalva/sneeze

**Physical Examination**

- Paraspinal muscle spasm
- +/- Sciatic notch tenderness
- +/- Straight leg raise (SLR) and/or Crossed straight leg raise (XSLR)
- Decreased ROM

# Sciatica




Examples of Disc Problems
Normal Disc
Degenerated Disc
Bulging Disc
Herniated Disc
Thinning Disc
Disc Degeneration with Osteophyte Formation

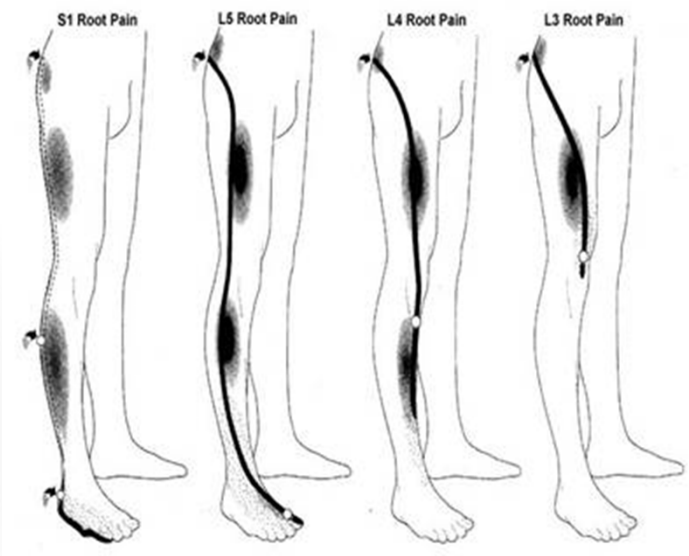
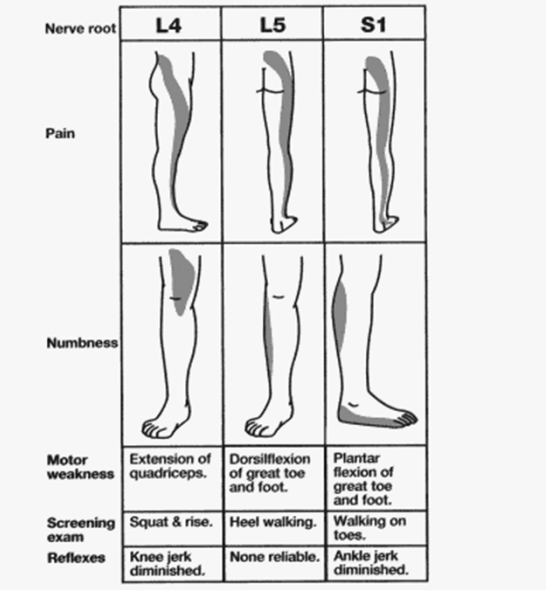

S1 Root Pain
L5 Root Pain
L4 Root Pain
L3 Root Pain

**Figure 1. Testing for lumbar nerve root compromise.**




# Straight Leg Raise Test (SLR)

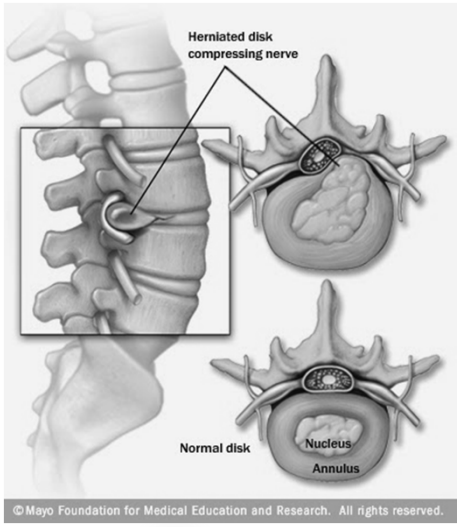
***SLR*** – positive result defined as reproduction of patient's sciatica between 30 and 70 degrees of leg elevation

High sensitivity (91%), modest specificity (26%) for herniated disc

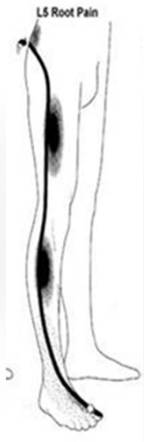
# Crossed Straight Leg Raise Test (XSLR)

- **More specific** for herniated disc (88%)
- Less sensitive (29%)

- **Positive** when pain is reproduced at less than 40 degrees of elevation in the unaffected leg




# Which nerve root?

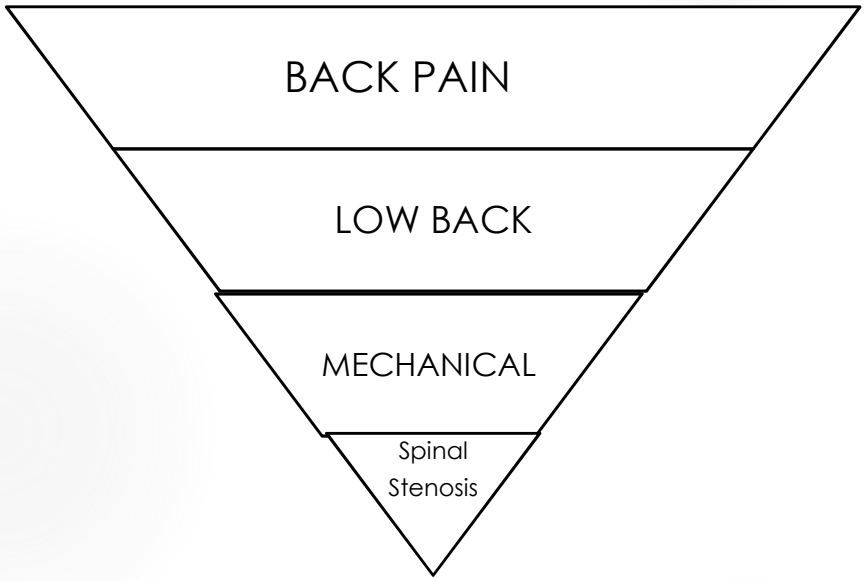



**L-5**

- Pain > buttock, posteriolateral thigh, calf, dorsum foot, great toe
- Great toe extensor weakness
- Numbness @ dorsal base of great toe

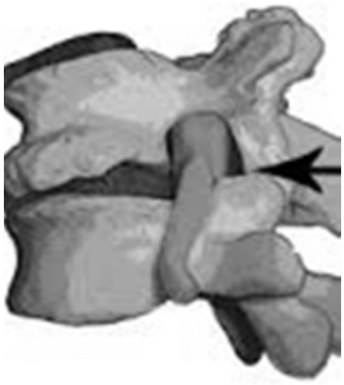
**S-1**

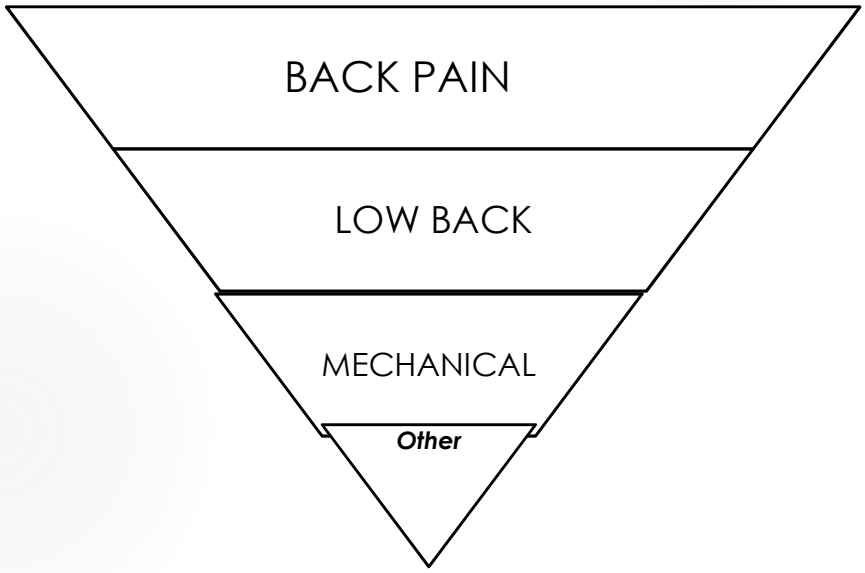
- Pain, numbness, parasthesia > buttock, posterior thigh, calf, lateral ankle/foot, lateral toes
- +/- calf atrophy
- Diminished/absent ankle jerk




## Spinal Stenosis

- Spinal canal and the neuroforamina are narrowed, often due to DDD, spurring, or arthritis
- Results in nerve root impingement and radicular pain
- Pain often BILATERAL, worse with standing, walking, relieved by rest (pseudoclaudication?)
- PE: usually full ROM, no tenderness SLR (-)

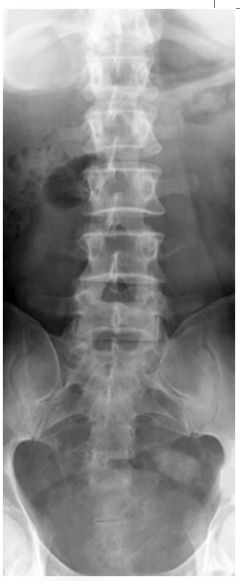





# Compression fracture

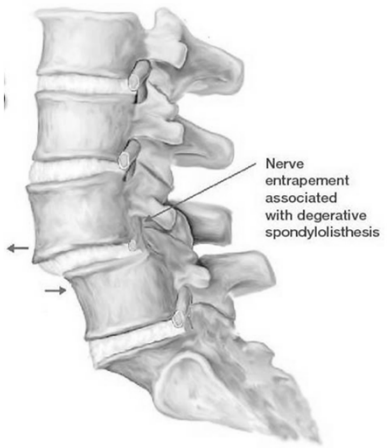
- Most common in elderly with osteoporosis
- Glucocorticoids
- Metastases
- Sudden severe back pain, *rarely radiates* into lower extremities

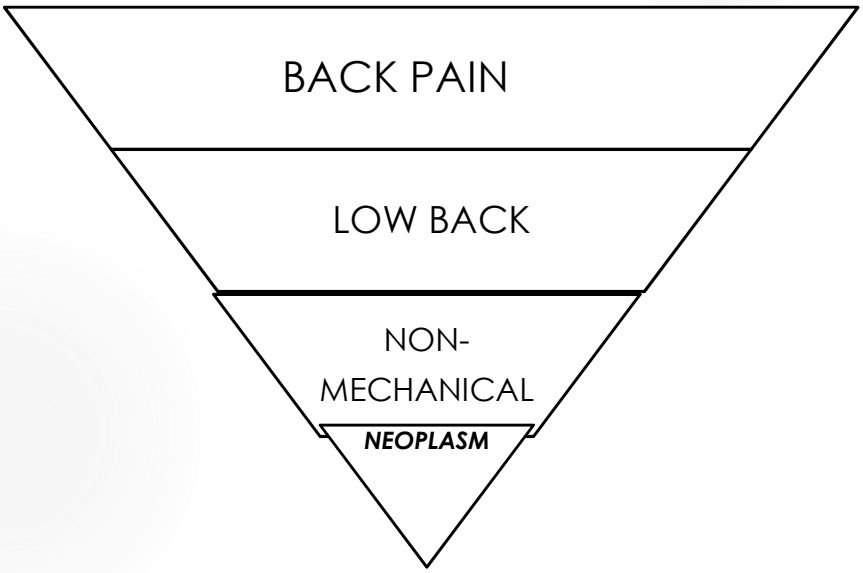
**Initial diagnostic imaging: AP/Lat Lumbosacral spine**



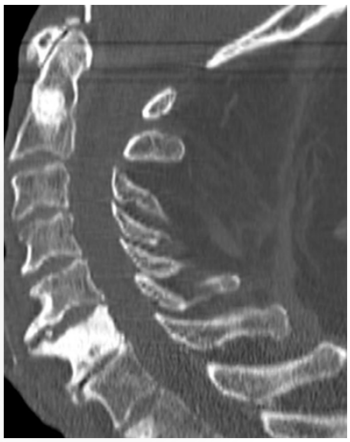
# Spondolisthesis

- Forward subluxation of the vertebrae
- Results from DDD and facet joint arthritis
- Usually L4-L5 or L5-S1
- Pain in low back, +/- radicular
  - Increased with prolonged standing and hyperextension
  - Bilateral hamstring tightness 80% of patients
- Buttock pain to knees when standing/walking
- Unexplained weakness with falls
- Cold feet
- Diagnostic testing: standing, lateral and L/S xray

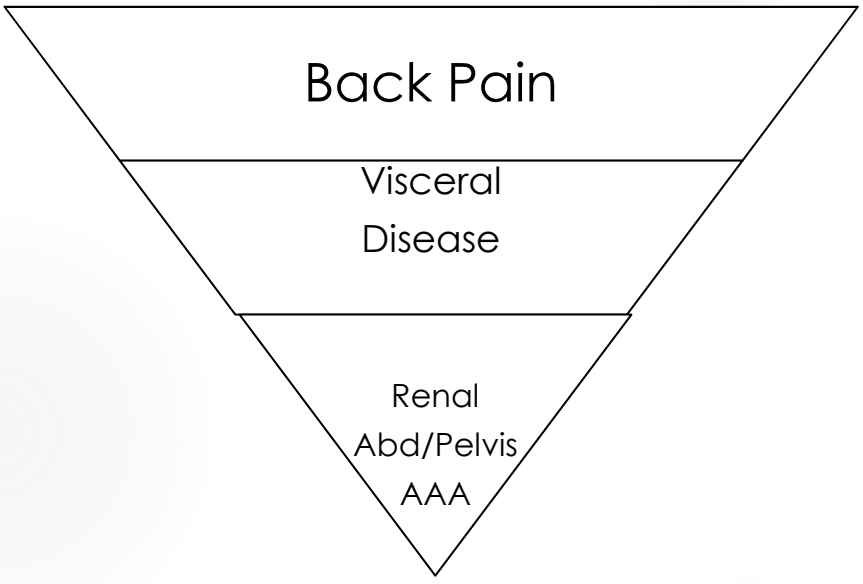


## NEOPLASM



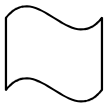
- **Usually metastatic** disease – breast, lung, prostate, GI, GU
- If primary, usually myeloma
- **Age < 20 or 50+**
- ***Back pain with a history of CA*** = ***RED FLAG***
  - *Night pain, unrelieved by rest, worse with lying down*
  - *Gradually increasing pain*
  - *High lumbar to mid-back very suspicious for mets*



# Visceral Causes:

- Abdominal Aortic Aneurysm (AAA)
- Renal – ex: pyelonephritis, Renal stone
- Pelvic – ex: ovarian CA, endometriosis, prostatitis, pregnancy, uterine fibroids
- Abdominal - constipation, etc

# ***RED FLAGS***

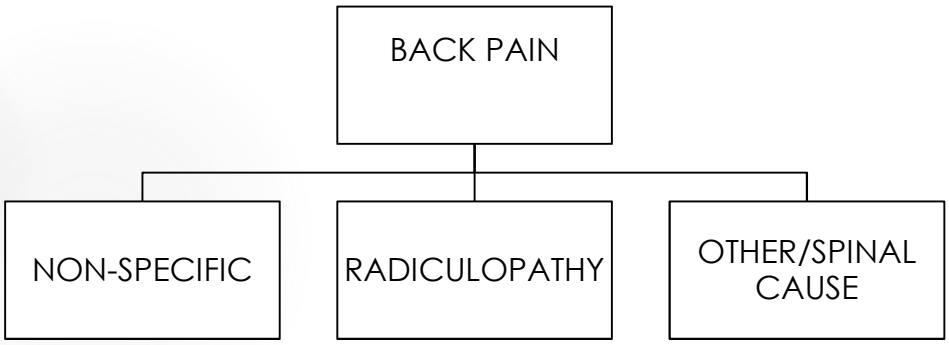


TUMOR or INFECTION?
- < 20 YRS OR > 50 YRS
- Constitutional symptoms
- Increased pain with rest
- History of Cancer
- Recent bacterial infection/immunosuppression

FRACTURE?
- Recent fall or MVA
- Osteoporosis

**Cauda Equina**
- Saddle anesthesia
- Bowel/bladder dysfunction
- Leg weakness or neuro deficit
- **STAT REFERRAL**

# APPROACH TO BACK PAIN:

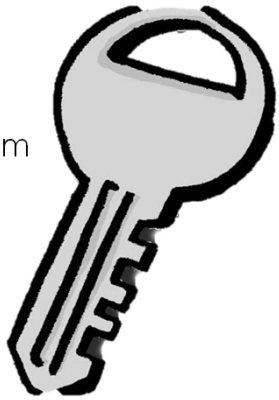



# Psychosocial Risk Factors:

Depression
Job dissatisfaction
Passive/poor coping strategies
Higher disability levels
Disputed compensation claims
Somatization

## *Key Historical Data*:

- Saddle anesthesia/bowel/bladder? Cauda Equina
- Constitutional symptoms? Neoplasm
- Pain unrelieved or worsened by lying down? Neoplasm
- Pain atypical location? Neoplasm
- History of CA? Neoplasm



Recent injury? Fracture

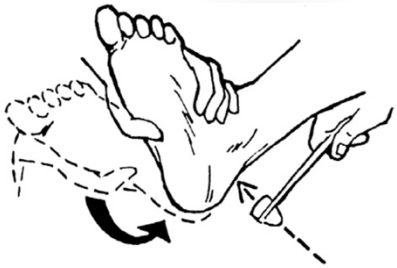
Recent procedure or infection? Infection

Sciatica symptoms? Likely mechanical

Morning stiffness? Likely inflammatory

Worse with standing/walking; relief with bending/sitting? Likely Stenosis

## *Focused* PE:



- Inspection, palpation, ROM
- SLR, XSLR
- Neurologic Examination
  - Patellar reflex (L4)
  - Great toe and foot dorsiflexion (L5)
  - Foot plantarflexion and ankle reflexes (S1)
  - Sensory deficits

## TO TEST OR NOT TO TEST????

#1: Suspect potentially serious condition?

If Yes, proceed with diagnostic testing

If No, Self care and non-invasive treatment

# Diagnostic Test of Choice:

| Suspected *Cause* | *Imaging* to Order |
|---|---|
| ▶ Cancer | ▶ L/S Spine; ESR; MRI |
| ▶ Compression Fracture | ▶ L/S Spine |
| ▶ Herniated Disc, **symptoms >1 mo.** | ▶ MRI |
| ▶ Spinal stenosis, **symptoms > 1 mo.** | ▶ MRI |
| ▶ Cauda Equina | ▶ MRI |
| ▶ Severe/progressive neuro deficits | ▶ MRI |

**90%** OF PATIENTS WITH LOW BACK PAIN WILL HAVE RESOLUTION OF SYMPTOMS WITHIN 1 MONTH **WITHOUT SPECIFIC THERAPY**

# More on MRI:

No radiation

Better visualization of soft tissue

Most insurance companies require L/S spine first, many require PT X 6 weeks

***PER GUIDELINES:***

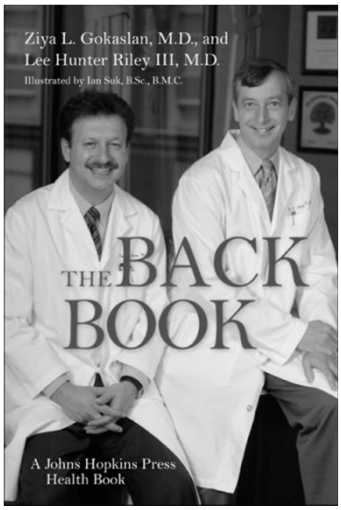
***MRI <u>ONLY</u> IF CANDIDATE FOR SURGERY OR EPIDURAL STEROID INJECTION***

# Treatment of Low Back Pain:

- **"Clinicians should provide patients with evidence-based information on low back pain with regard to their expected course, advise patients to remain active, and provide information about effective self-care options"**

# Self-Care Recommendations:

- Normal activity as soon as possible
- ***The Back Book***
- Work restrictions?
- Medium-firm mattress
- Heat/Ice




# *Non-Pharmacologic* Measures:

1. Spinal manipulation – acute**
2. Exercise therapy (PT and home) – esp. individualized including stretching and strengthening
3. Interprofessional collaboration (psych, vocational rehab)
4. Accupuncture, massage, yoga

# MEDICATION:

- **First line: Acetaminophen or NSAIDS**
  - Acetaminophen considerations: Cheap, safe, liver
  - NSAID considerations: more effective, GI, kidney and heart risks
- ***After careful consideration***: Opioids
  - ***NO PROVEN EFFICACY FOR LONG-TERM TREATMENT OF BACK PAIN***
  - Assess risk of abuse/addiction
  - If no significant improvement, discontinue and/or refer

# More on Opioids…..

- 2007: prescription opioid **abuse costs** = approx. $56 BILLION
- 2011: **420,040 ED visits** related to misuse or abuse of opioids
- 2012: Drug overdose **leading cause of death**
- 2013: ***16,235 DEATHS*** from opioid overdose

# Meds (cont):

## Skeletal Muscle Relaxants

**AVOID IN ELDERLY**

- Tizanidine (Zanaflex)
  - Start at 2mg Q 6-8, increase to max of 8mg Q 6-8 hrs
  - Non-sedating

Similar safety and efficacy, POTENTIALLY sedating:

- Cyclobenzaprine (Flexeril) - CHEAP. start 5mg po tid prn
- Carisoprodol (Soma)*** - potential for abuse!
- Methocarbamol (Robaxin) – Can start at 1500mg QID < 3 days. Easy daily dose to remember is 750mg po Q 4 hours
- Metaxalone (Skelaxin) – expensive. 800mg tid-qid

# Meds (cont):

- Gabapentin:
  - Short-term for radiculopathy. Start 100mg po QHS; common dose is 300-600 mg po tid
- SSRIs – not effective
- SNRI – Duloxetine (Cymbalta) – chronic musculoskeletal pain
- TCA – Amitriptyline 10-100mg po QHS
- Steroids = placebo

# Other Meds:

- **Lidoderm 5% patch**: Apply to intact skin, up to 12 hours/day
  - Max 3 patches at a time
- Capsaicin Topical – OTC: tid to qid
- Pregabalin (Lyrica) – *neuropathic* pain
  - 75-300 mg po bid; start at 75mg
  - *Caution: adverse reactions and interactions*

# Interprofessional Resources:

- Chiropractic
- Physical Therapy
- Pain Management
  - *Use caution*
- Neurosurgery
  - Progressive neurologic signs
  - Willing to proceed with treatment recommended?
- Psych

# End of Back Pain