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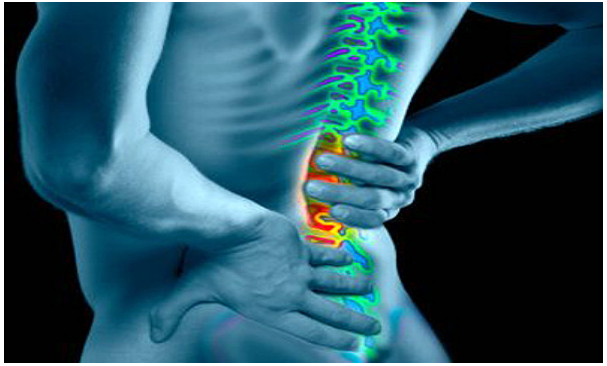

AMAZING THINGS ARE HAPPENING HERE

Tips for a Healthy Spine

October 10th, 2017

Michael Sein, MD
Assistant Professor, Rehabilitation Medicine

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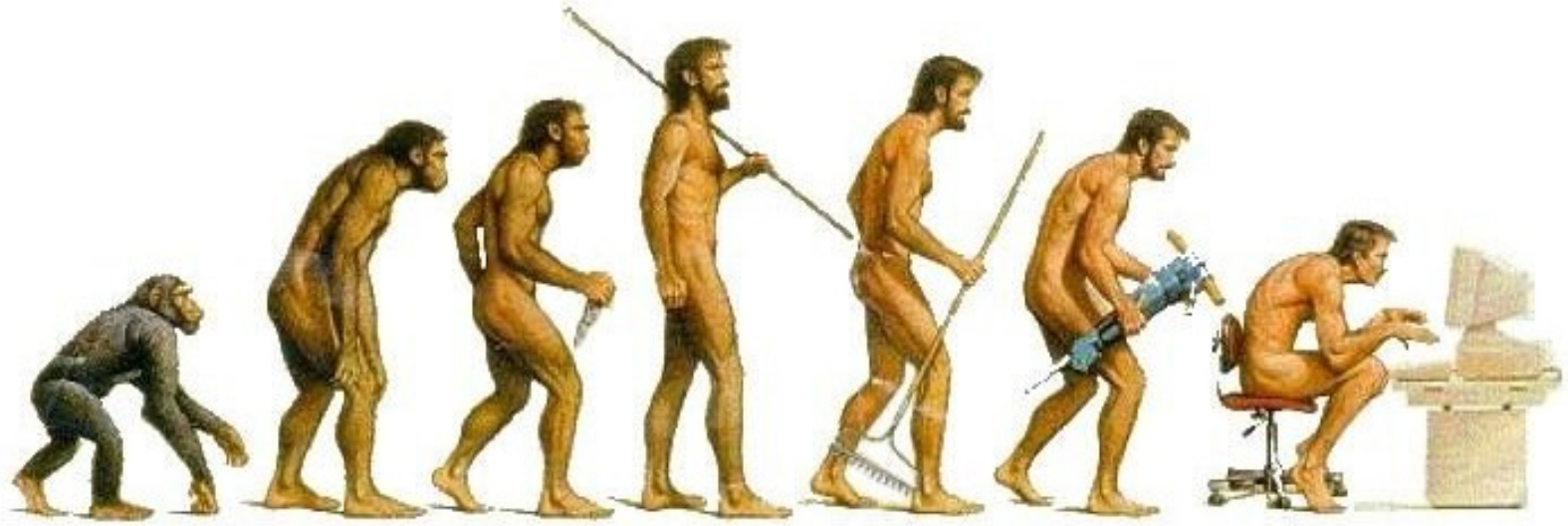
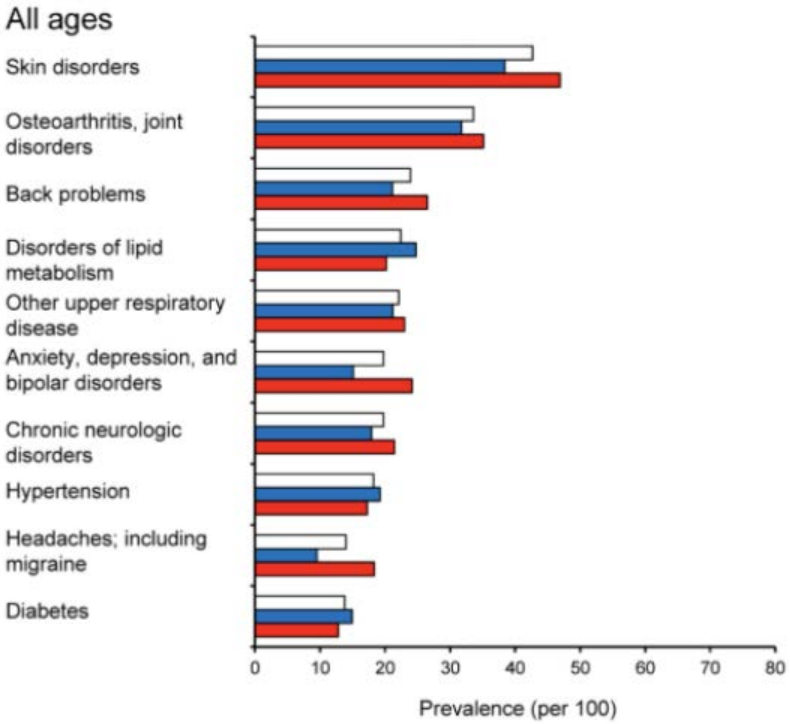
No Conflicts of Interest



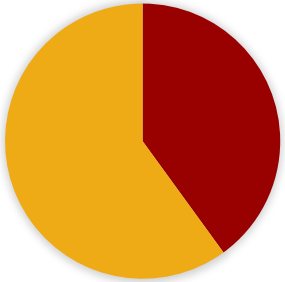
Outline for Today's Talk

- Scope of the problem
- Basic spine anatomy
- What causes spine pain
- What can be done to manage spine pain

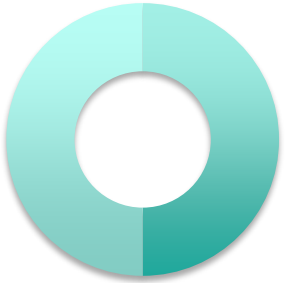
Back Pain is extremely common



LIFETIME RISK OF "SCIATICA"



MALE: FEMALE RATIO



St. Sauver JL, et al. Why do patients visit their doctors?
Assessing the most prevalent conditions in a defined US population.
Mayo Clinic proceedings Mayo Clinic. 2013;88(1):56-67. doi:10.1016/j.mayocp.2012.08.020.

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Spine Anatomy 101

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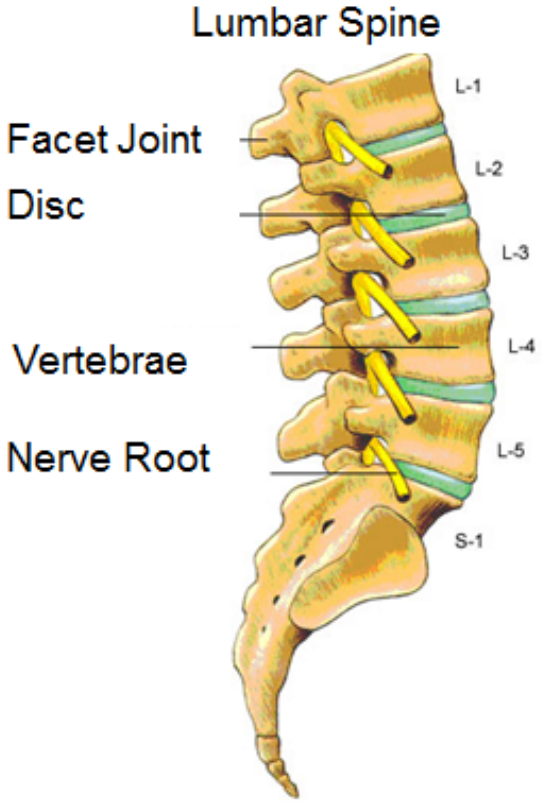
Anatomy



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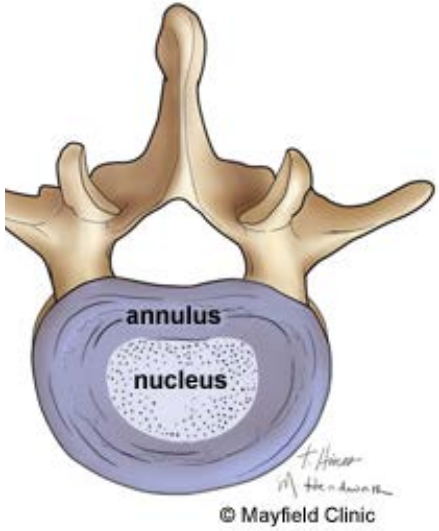
Anatomy



- Shock absorber
- Allows for bending and twisting motions
- Built like the sole of a sneaker

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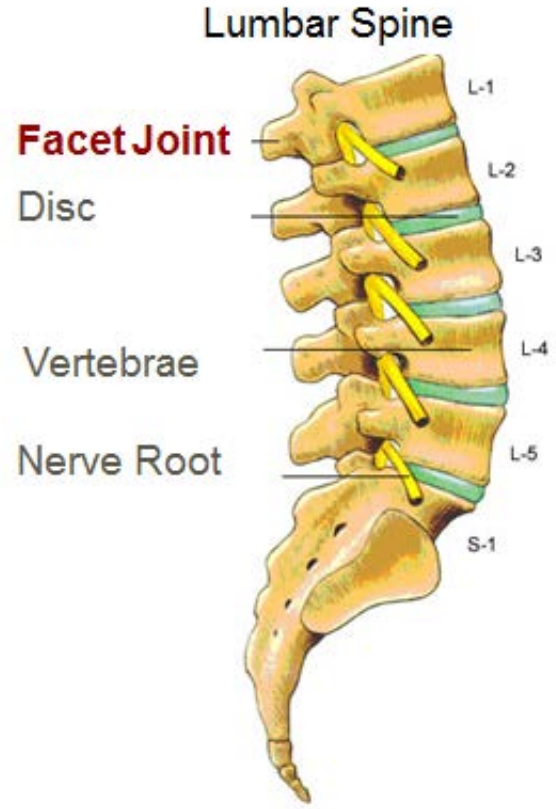
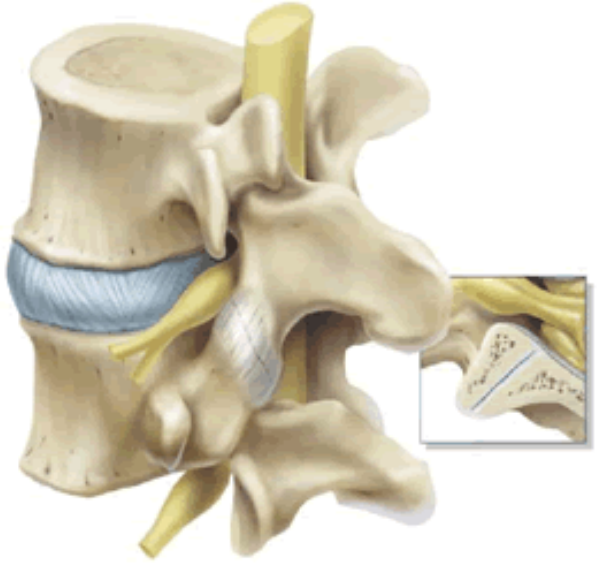
Anatomy



- Connection between neighboring vertebrae
- “Knuckles” of the spine



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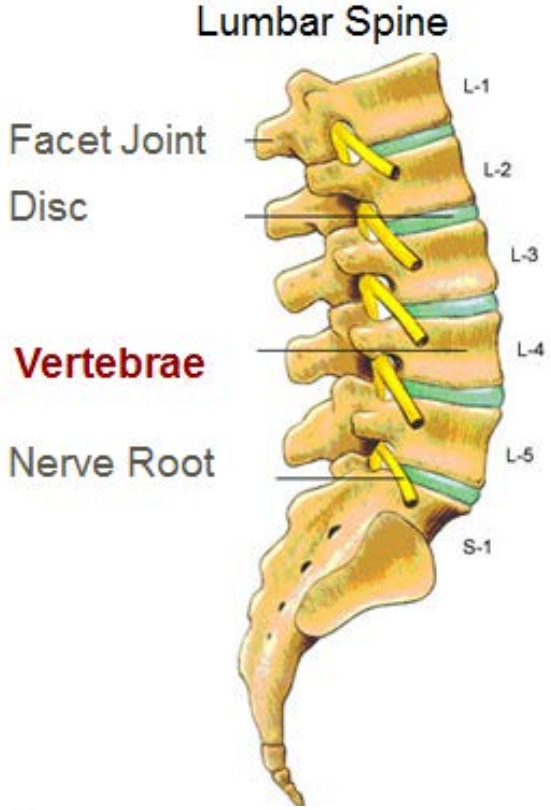
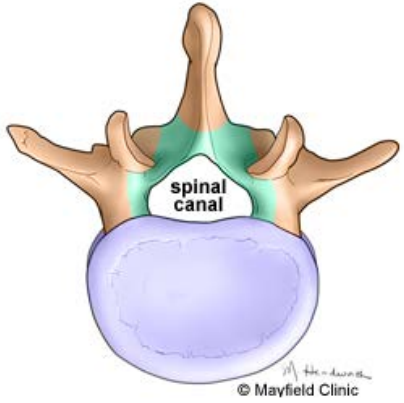
Anatomy



- Stacking blocks
- Shaped with a central hole
- These align to form the spinal canal



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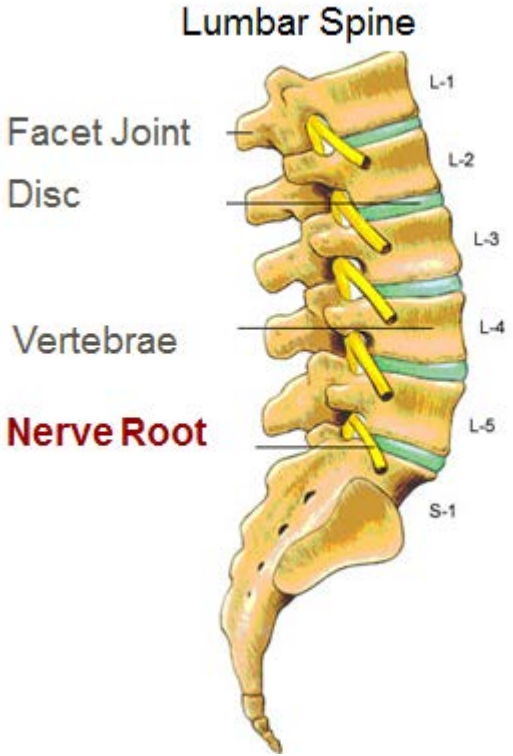
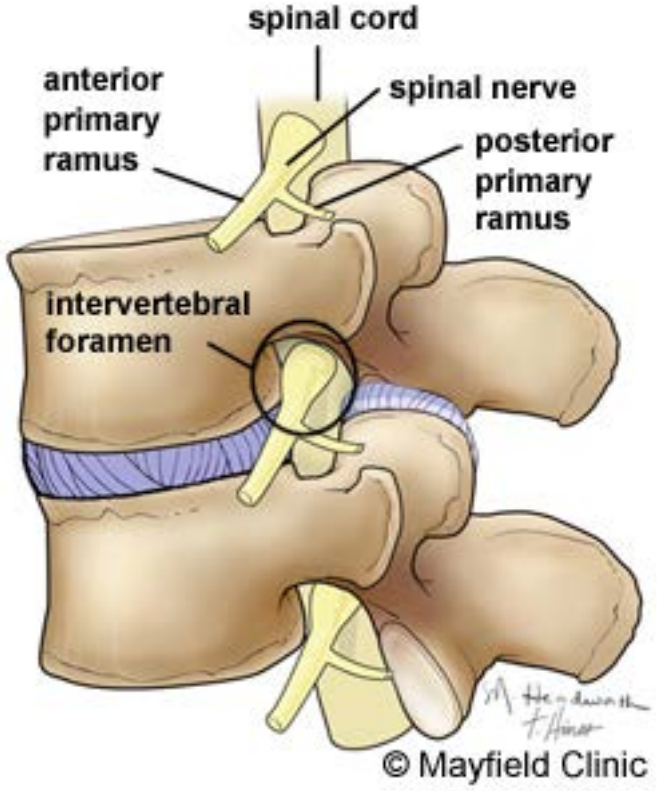
Anatomy





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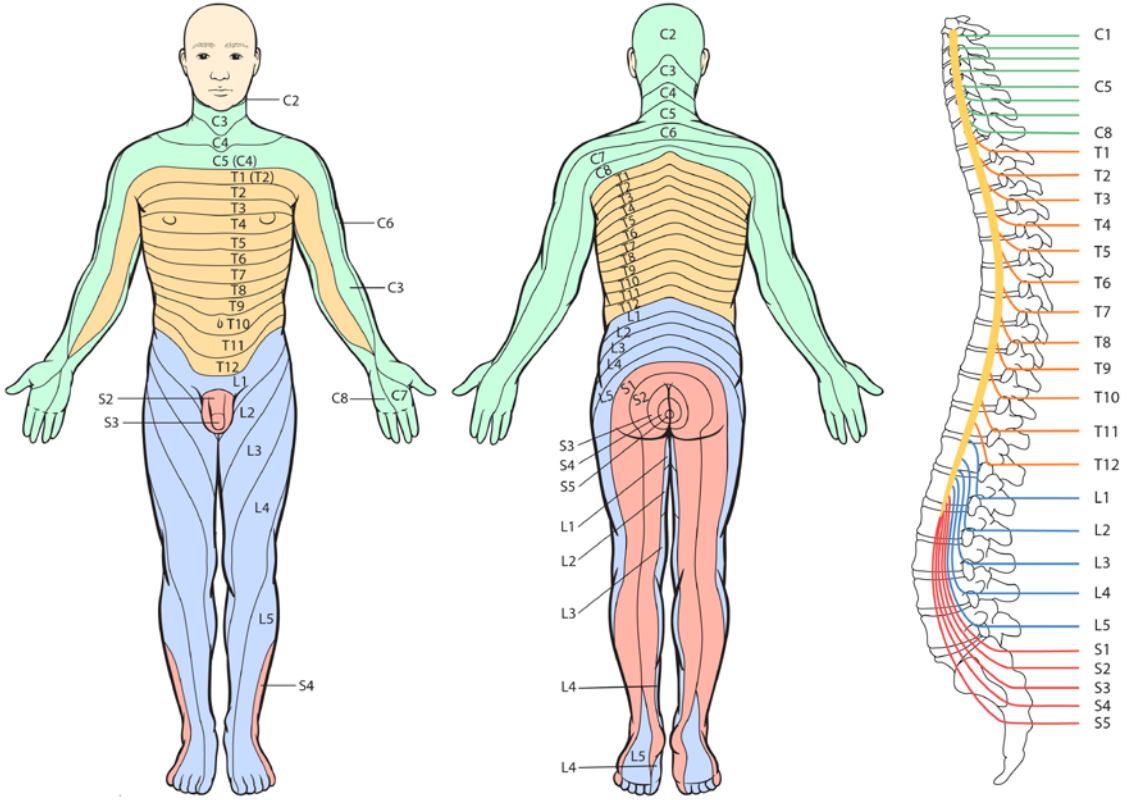
Dermatomes



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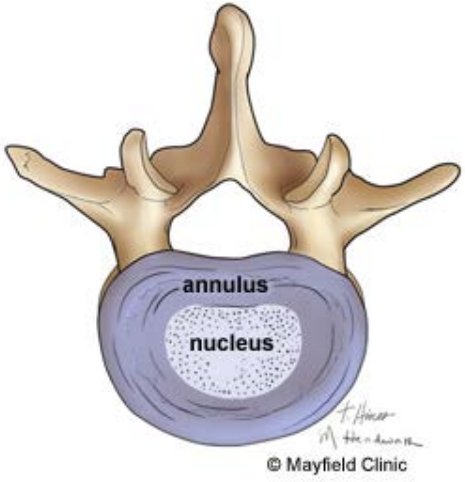
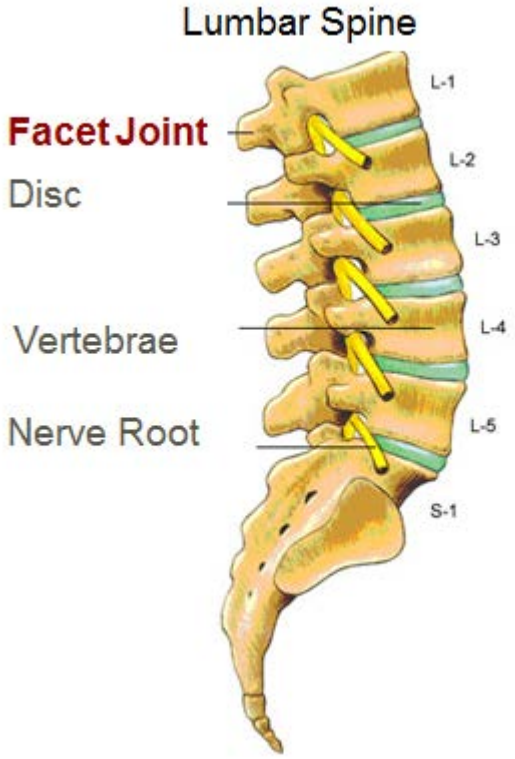
Common Causes of Pain

Common Causes of Pain – Disc Tears

- Pain with increased pressure on the disc
- Can be associated with sitting, coughing and sneezing



Common Causes of Pain – Facet Joint Arthritis



- Can be unilateral or bilateral
- Associated with stiffness
- Scoliosis can predispose

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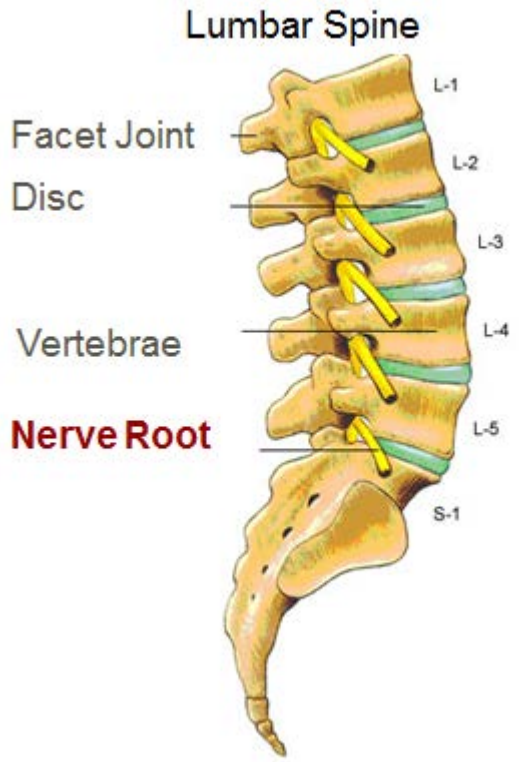
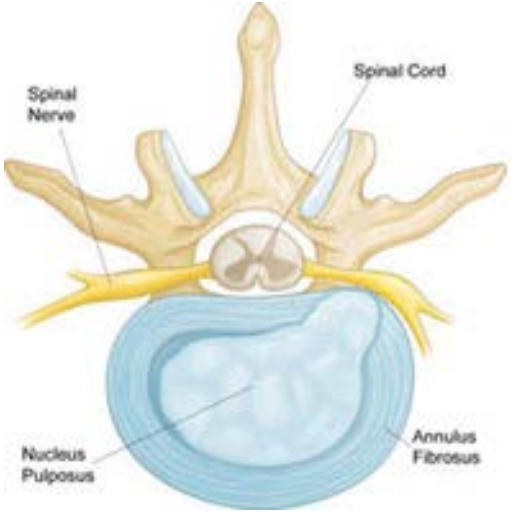
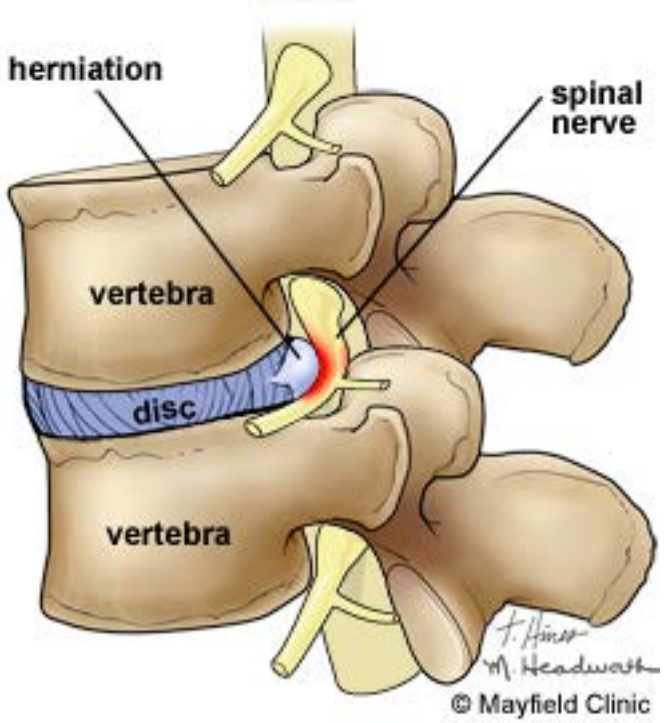
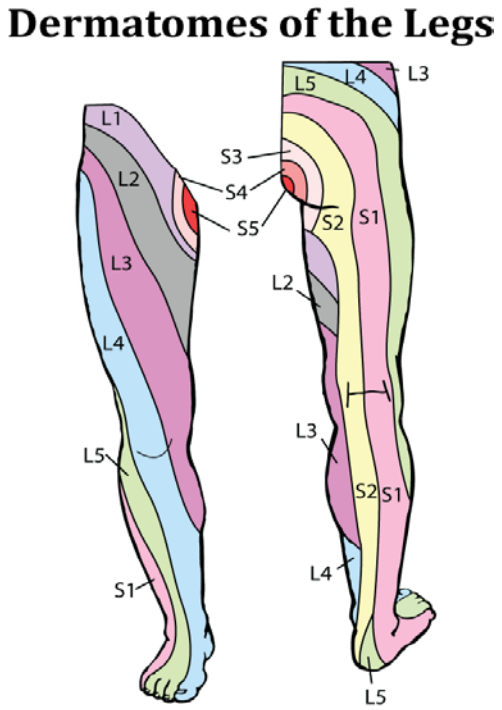
Common Causes of Pain – Pinched Nerve Herniated Disk





Common Causes of Pain – Pinched Nerve Herniated Disk





Ways of Avoiding Low Back Pain

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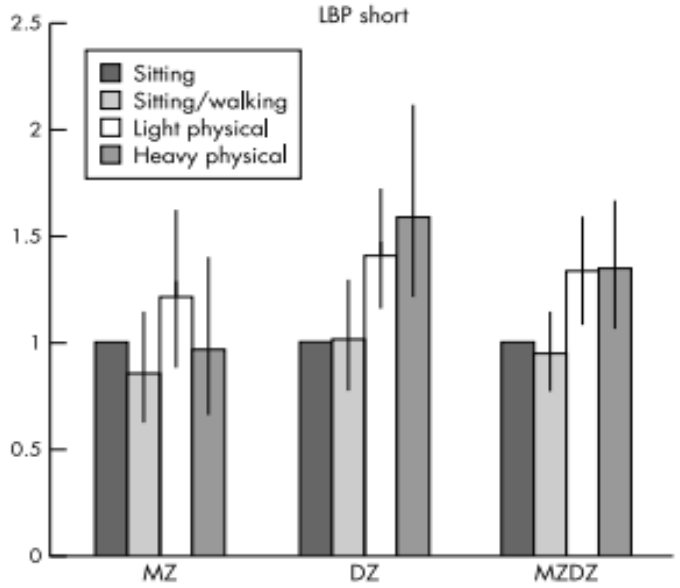
There is a Genetic Component to Back Pain

The genetic component to back pain is independent of the activities that we do



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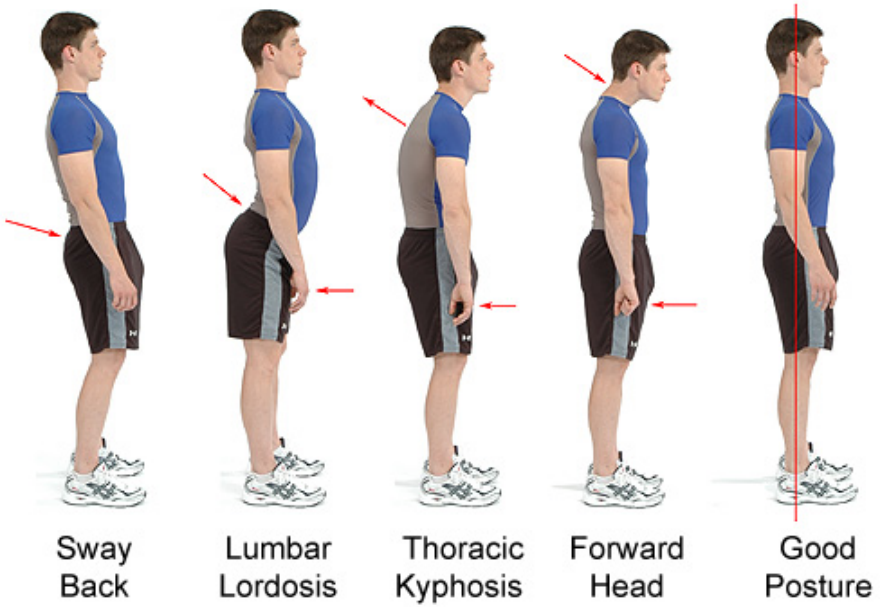
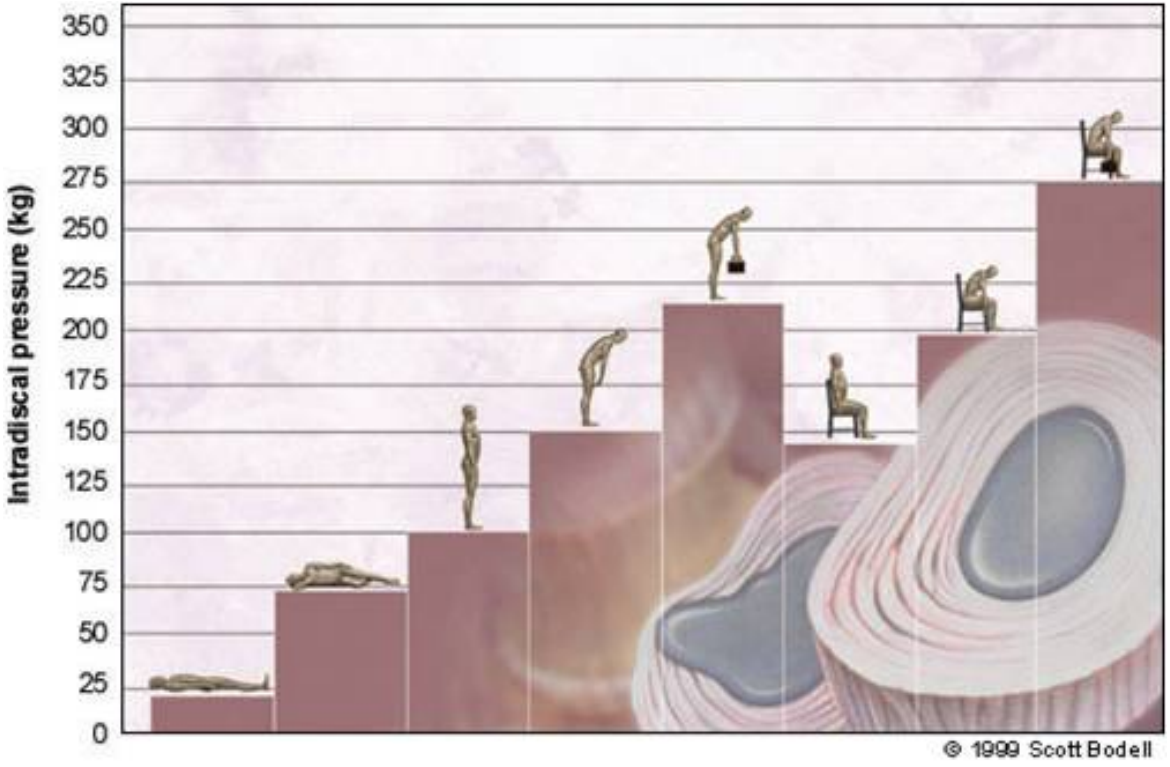
Don’t Be a Slouch

- Hold your stomach in
- Keep your head straight
- Starts in childhood



Pressure on Discs Varies by Position & Activity



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The neck is a fulcrum with the weight of the skull being the forces transmitted to the base of the cervical spine and shoulders.

Position	Neutral	15 °	30°	45 °	60 °	90°
Force To Cervical Spine	10-12lbs.	27lbs.	40lbs.	49lbs.	60lbs.	Not Measurable

Carrying a Bag

- *Smith et al. Gait and Posture 2006*
- 30 female students (22.4 +/- 2.2)
- 15% bodyweight backpack
  - Without backpack
  - Both shoulders
  - Unilateral shoulder

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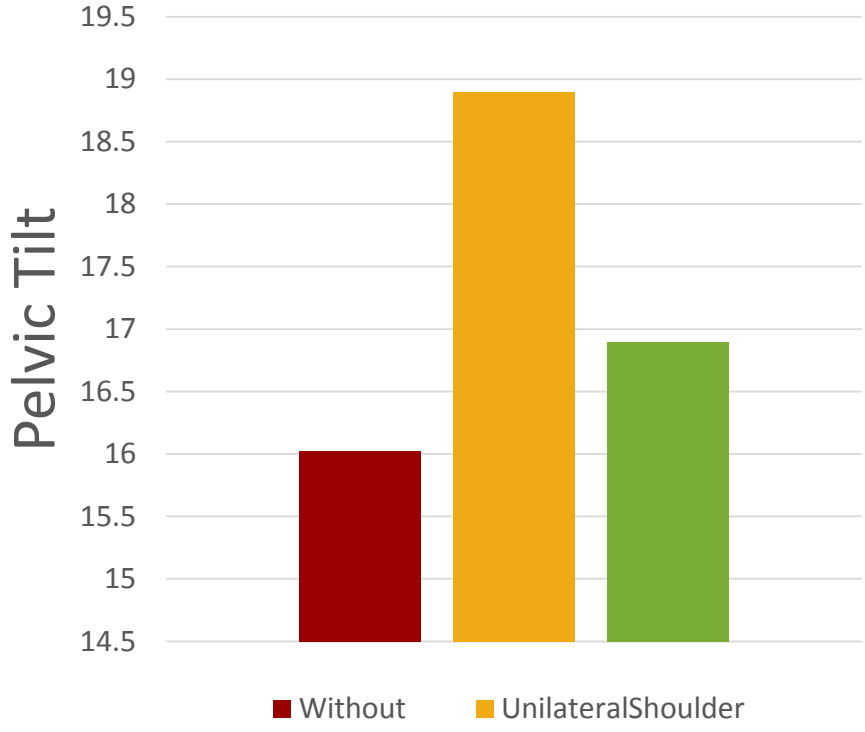
Carrying a Bag



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Lighten Your Load

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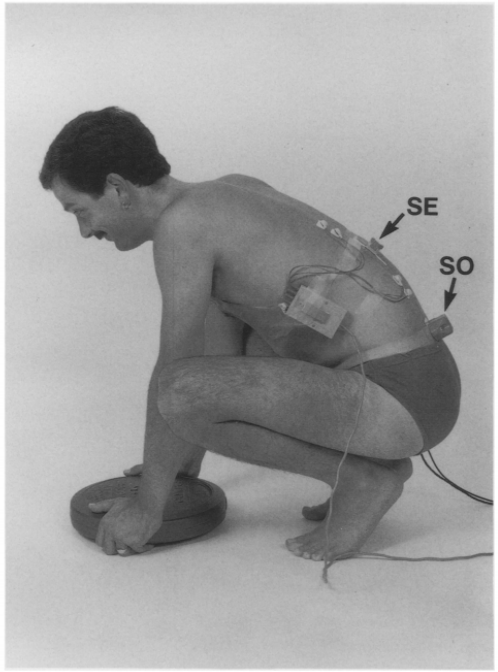
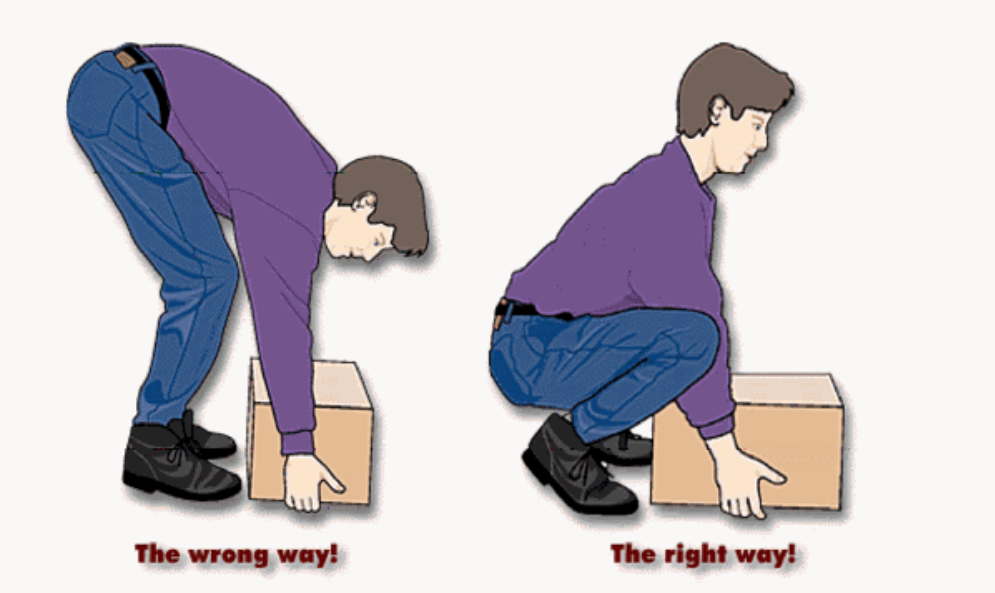
How we lift affects pressures exerted on our spine discs



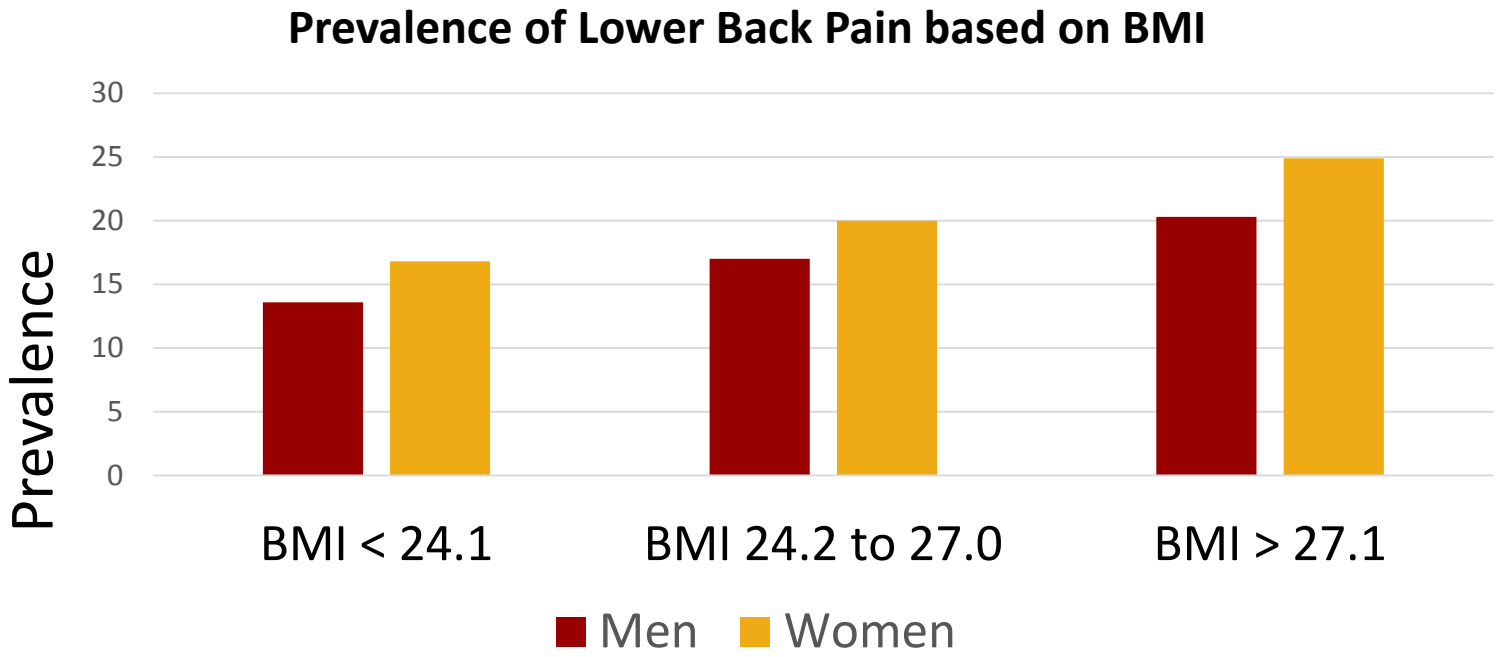
Condition	0 kg	10 kg	20 kg
Squat- Bending Torque	13.1	17.1	19.2
Stoop- Bending Torque	23.4	30.2	34.3

Take a Load Off

- Don’t lift anything too heavy
- Kneel down and tighten abs
- Lift with legs, not your back



Rates of Chronic Lower Back Pain Increase with Body Mass Index



- Han TS et al. International J of Obesity 1997

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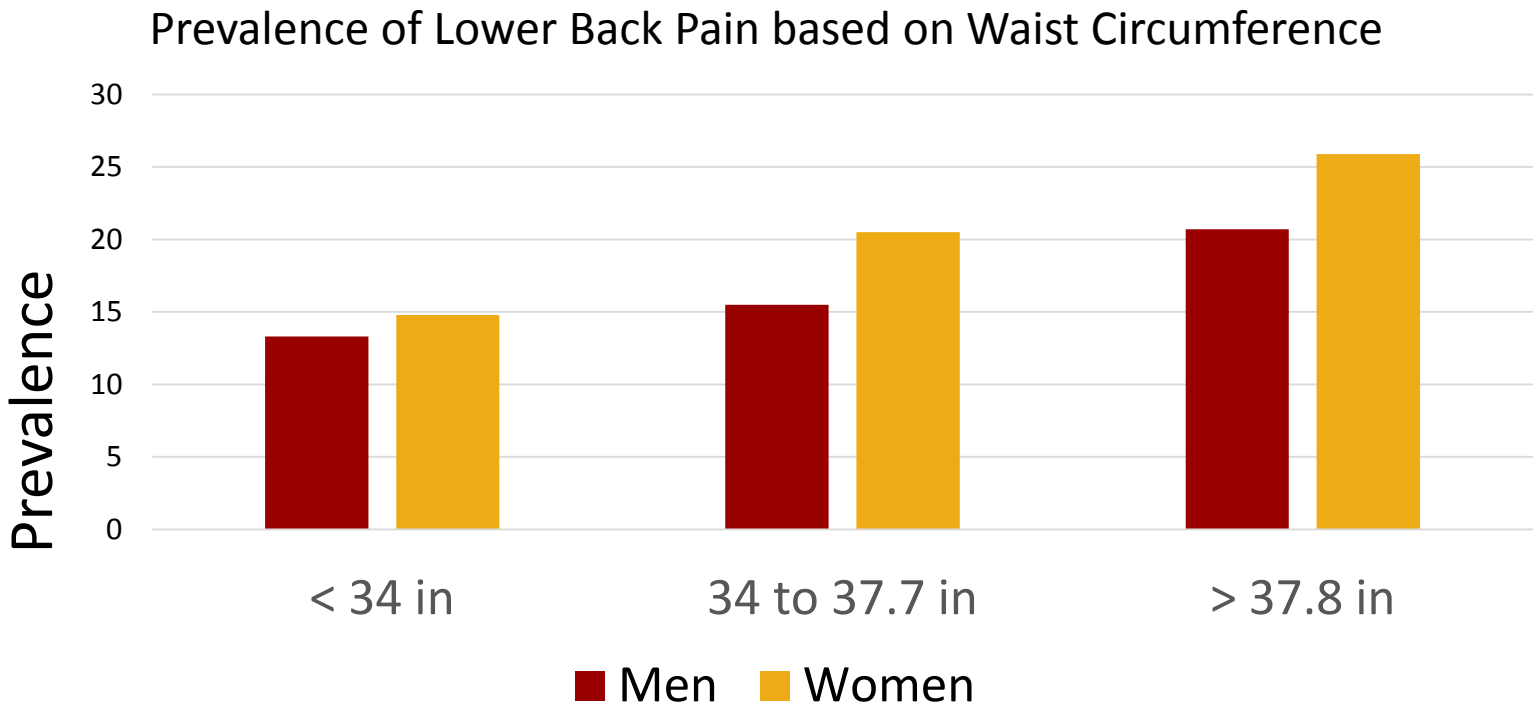
Distribution of Fat Also Plays a Role in Back Pain Prevalence



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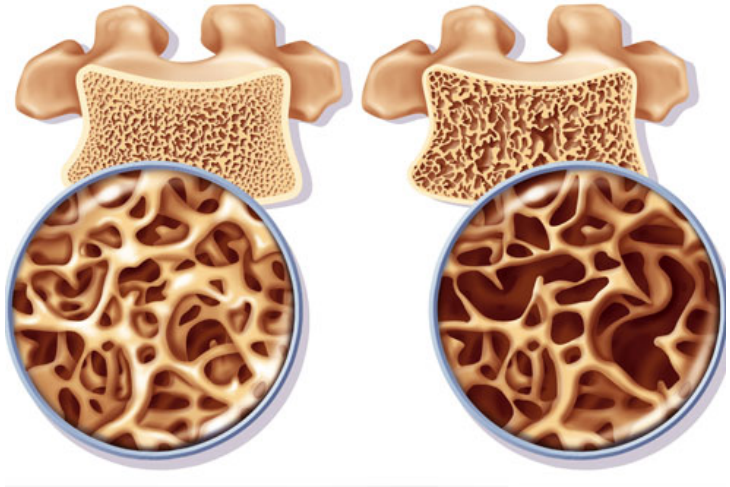
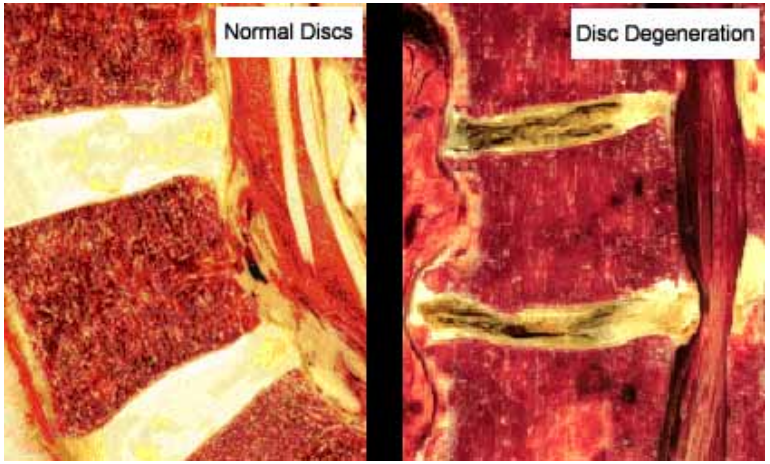
Smoking, in addition to a long list of other health offenses, restricts blood flow to the discs that cushion and support your spine.





Pilates and Back Pain

Rydeard et al. J Ortho & Sports Physical Therapy 2006

- RCT with 39 active patients with chronic LBP
- Specific Pilates group vs standard of care
- **Results**
  - RMDQ
    - Pilates (2.0) vs Control (3.2) p=0.023
  - Pain
    - Pilates (18.3) vs Control (33.9), p=0.002

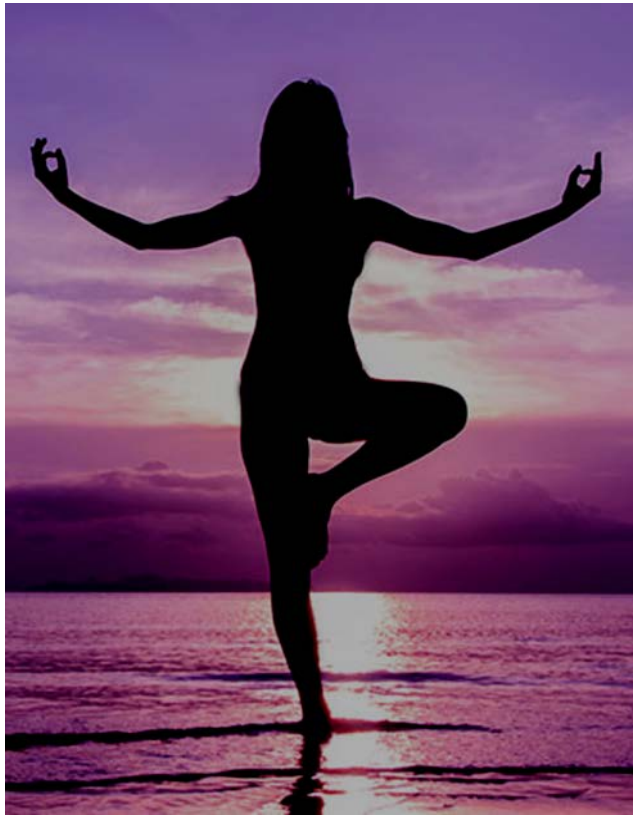
- **Conclusions**
  -Treatment with a modified Pilates-based approach is more efficacious than usual care in a population with chronic low back pain

Yoga for Back Pain

Cramer et al. Clin J of Pain 2013

- 967 patients with CLBP
- **Results**
  - Strong evidence for short-term effects on pain
  - Back-specific disability
  - Global improvement
  - Yoga was not associated with serious adverse events.
- **Discussion**

  - This systematic review found strong evidence for short-term effectiveness and moderate evidence for long-term effectiveness of yoga for chronic low back pain



Good and Bad Spine Exercises

- Exercise is good for the lower back
- Not all are beneficial
- However:
  - Toe touches may increase stress on disc and ligaments
  - You CAN overstretch hamstrings

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Try: Hamstring Stretches

- Lie on back and bend one knee
- Gentle stretch down the back of your leg
- Hold 15-30 sec
- 2-4 reps

Core Stability

Crunches	Sit-Ups
Strengthen back and stomach	Strain Hip Muscles
Tighten abs	Pressure on the discs
Breathe out	

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Try: Press-up Back Extensions

- Lie on stomach
- Push with your hands
- Use elbows if needed
- Hold for several seconds

Try: Bird Dog

- Start on your hands and knees
- Tighten stomach muscles
- Lift one leg
- Try lifting and extending your opposite arm
- Low back stability

Try: Bridging

- Lie on back with knees bent
- Push your heels and squeeze buttocks
- Lift hips off the floor
- Avoid overarching
- Hold 10 seconds

Summary

- Back and neck pain are extremely common and not completely avoidable
- Maintaining a healthy diet and exercise program has been shown to reduce pain
- Flexibility and core stability become more important as we age
- While we cannot reverse time or pick or parents, rehabilitation specialists can prevent progression

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Thank you!

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Assistant Professor, Rehabilitation Medicine

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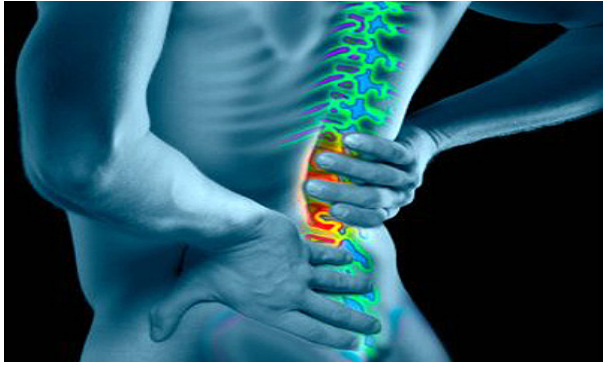

AMAZING THINGS ARE HAPPENING HERE

Low Back Pain
Is Surgery the Answer?

Ali A. Baaj, MD
Assistant Professor of Neurological Surgery
Weill Cornell Medical College

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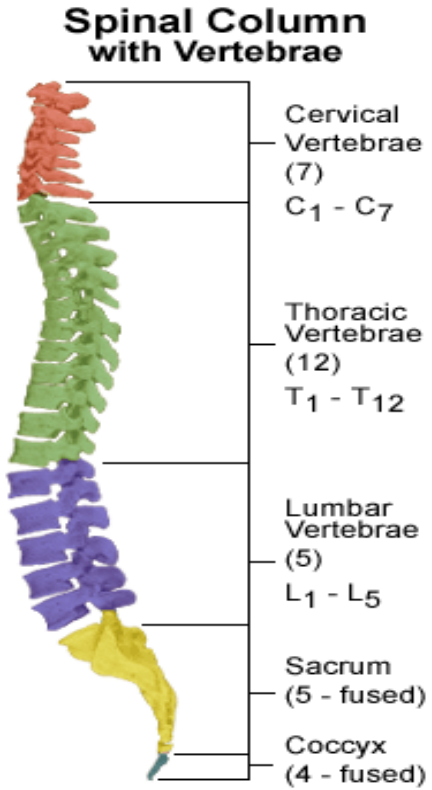
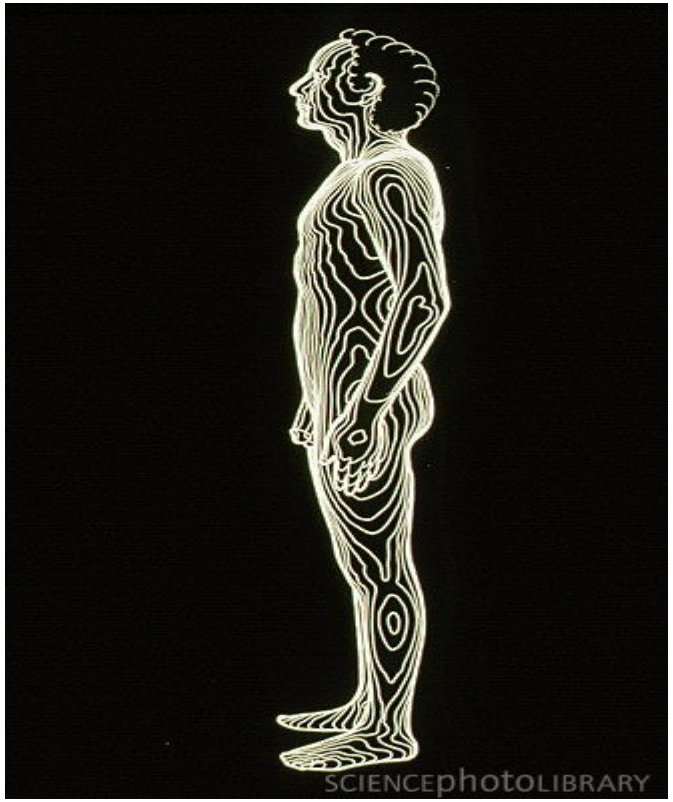
How Common is Back Pain?

- 8 out of 10 in US suffer from low back pain
- Major cause of visits to doctors and the ER
- Major cause of missed work days
- Costs over $50 billion per year

Back pain is a big deal!

Why is Back Pain Common?





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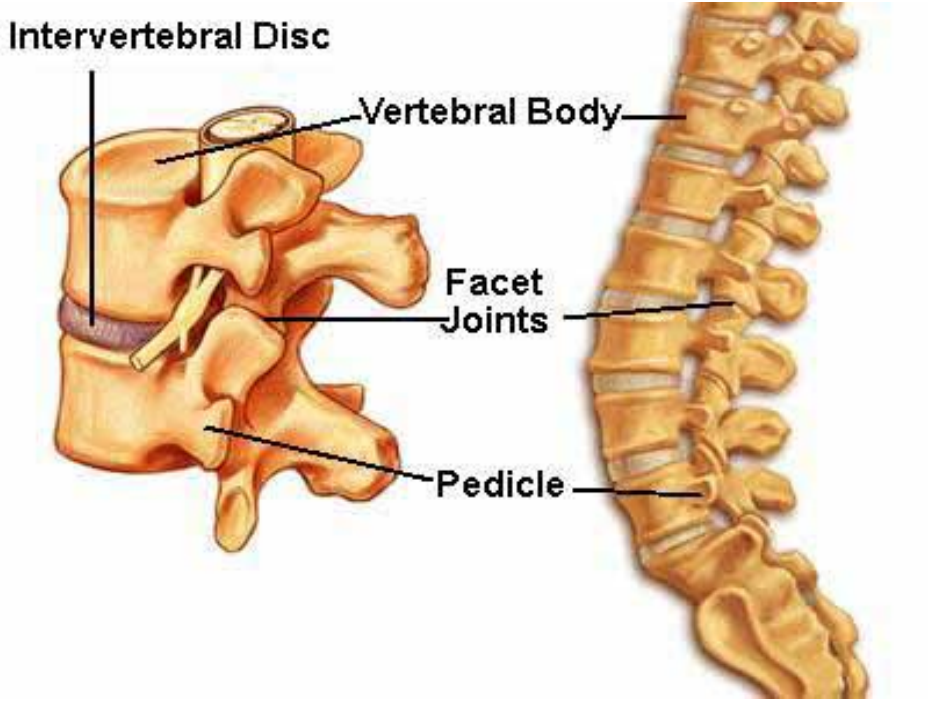
Lower Back Anatomy

- 5 lumbar vertebra – *carries the weight*
- Disks – *act as shock absorbers*
- Joints/ligaments/muscles – provides mobility
- Nerves – control LE function/bowel/bladder/sexual function



Low Back Pain Diagnosis

- History
- Physical Examination
- Diagnostic studies
  - MRI, CT, X-rays

Low Back Pain Specific Causes

- Disk herniation/degeneration (spondylosis)
- Scoliosis
- Spinal infections
- Osteoporosis related spine fractures
- Trauma
- Tumor

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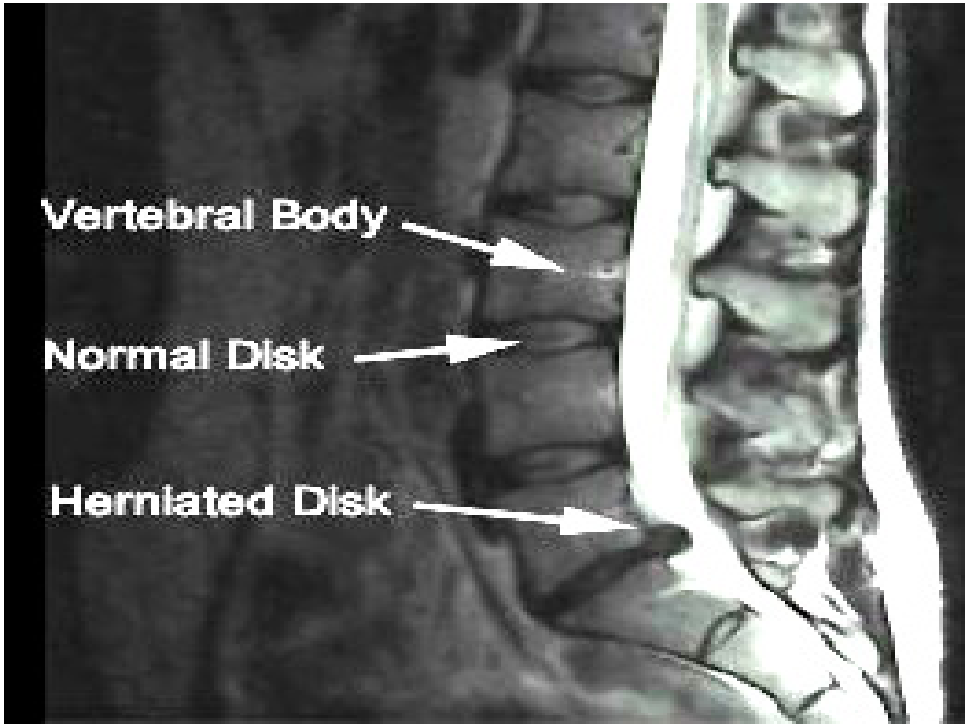
Disc Herniation



How Do I Know if I have a Herniated Disc?

- Unilateral leg pain > low back pain
- Radiates to foot or toes
- Numbness and tingling in leg or foot
- Sometimes after lifting something heavy or moving furniture

Prognosis

- 90% of pts with acute LBP will have stopped consulting their doctor within 3 mos (Croft BMJ 1998)
- 5% of pts with an acute episode of LBP develop chronic LBP and related disability (Koes BMJ 2006)

Most DON’T Need Surgery

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Risk Factors

Risk factors	Occurrence/Chronicity
• Individual	Age, obesity, weakness of back and abdominal muscles, smoking
• Psychosocial	Stress, anxiety
• Occupational	Lifting, bending

Low Back Pain Diagnostic Studies

- Plain x-rays – Flexion/Extension views
- Myelogram
- Post-myelogram CT scans
- MRI scans
- Bone scan
- EMG/NCV
- Discogram
- Selective Diagnostic Blocks
  - Nerve root blocks
  - Facet blocks

Radiographic Studies and LBP

- Boden et al studied 67 asymptomatic patients and found abnormalities in one third of patients
  - Boden SD, Davis DO, David DD, et al. Abnormal magnetic resonance scans of the lumbar spine in asymptomatic subjects: a prospective investigation. *J Bone Joint Surg [Am] 1990; 72: 403-408.*
- Radiographic abnormalities in 40-50% of those without LBP
  - Roland M, van Tulder M. Should radiologists change the way they report plain radiography of the spine? *Lancet* 1998; 352:348-9.

Low Back Pain Treatment

- Medical Therapy
- Non-surgical procedures
- Surgery

Low Back Pain Medical Therapy

- Assurance/Education
- Lifestyle Modifications
- Physical Therapy
- Medications
    - Non-steroidal
    - Steroidal
    - Muscle Relaxants
    - Pain medication

Low Back Pain Non-Surgical Procedures

- Injections
  - Epidural steroids
  - Facet Joint Injections
  - Nerve Root Injections

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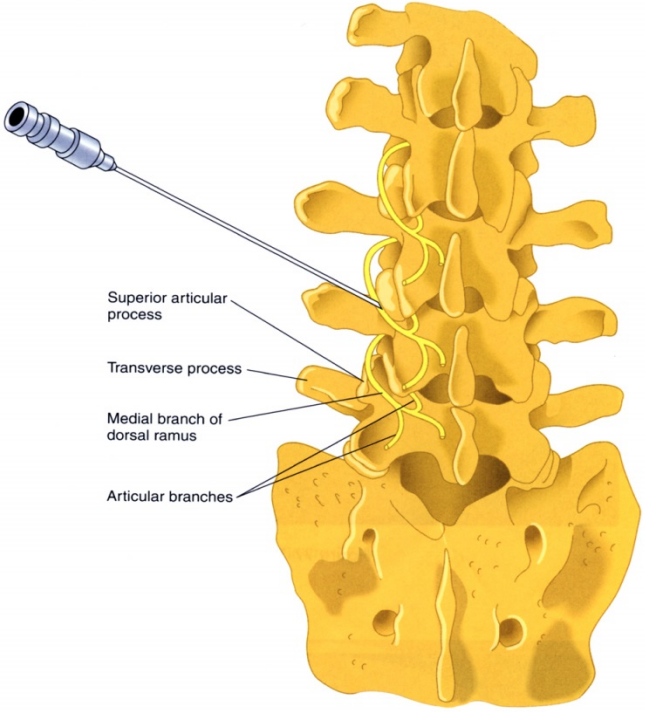
Injections


Superior articular process
Transverse process
Medial branch of dorsal ramus
Articular branches

Low Back Pain Surgical Treatment

- Highly successful when executed well on the right patient
- Accurate DIAGNOSIS is critical!
- Complications can be DEVASTATING

  i.e. Paralysis/Death
- Failed surgery – very difficult to correct

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Low Back Pain Surgical Treatment

- What are the goals of surgery?
    1) Remove disc or bone that is compressing the nerve and/or
    2) Stabilize the spine with instruments (screws, rods)

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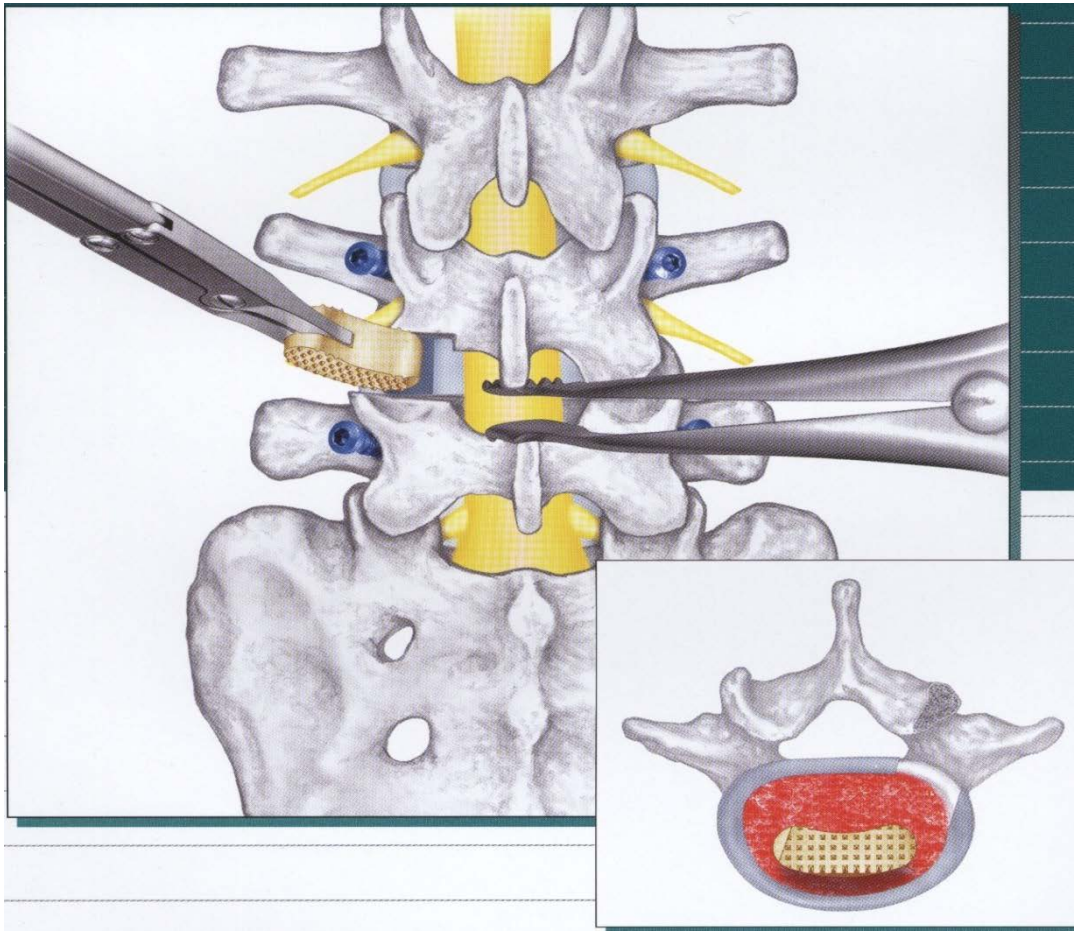

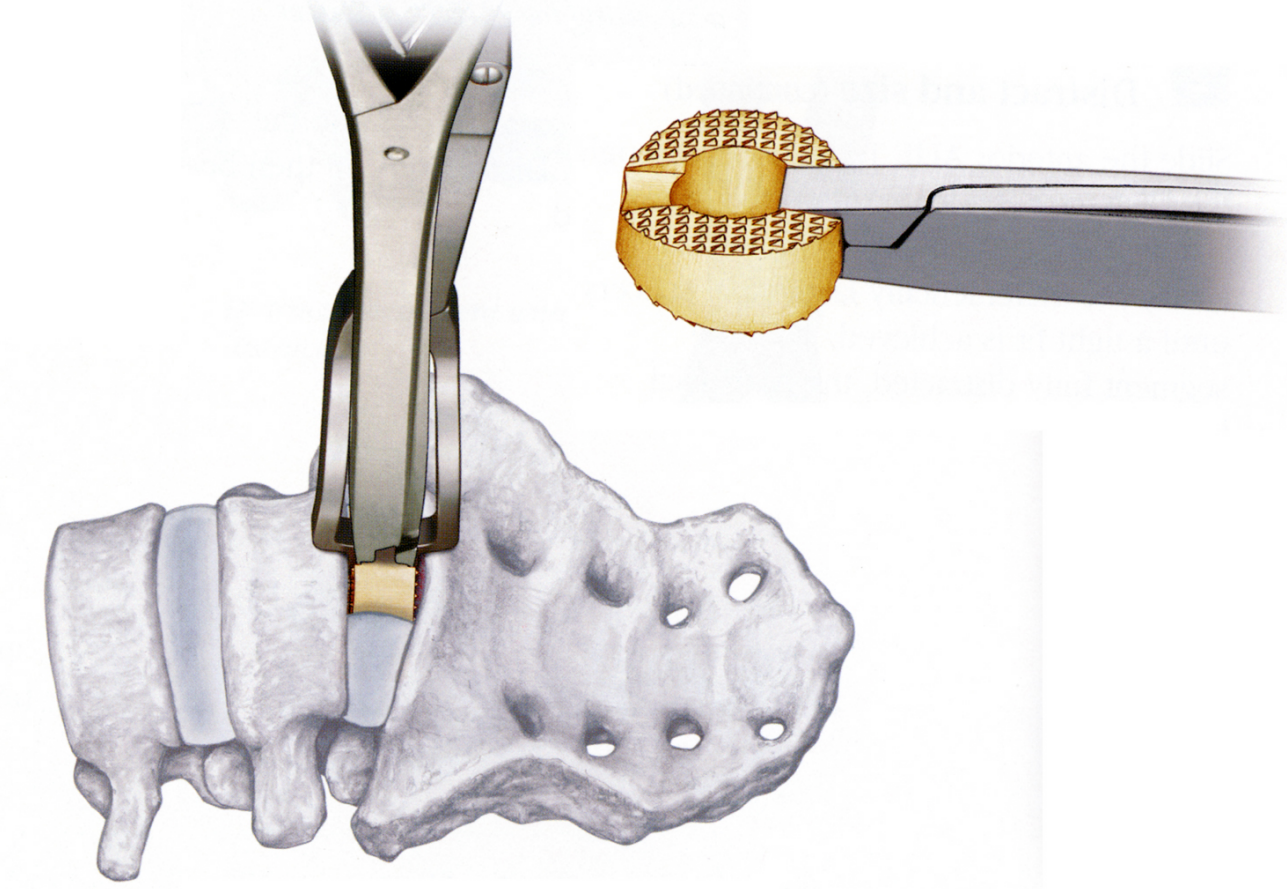

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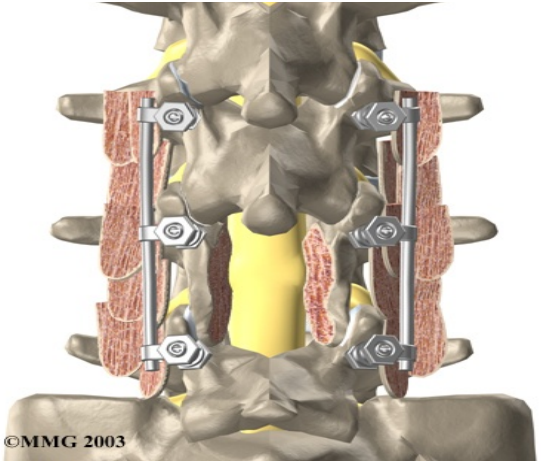
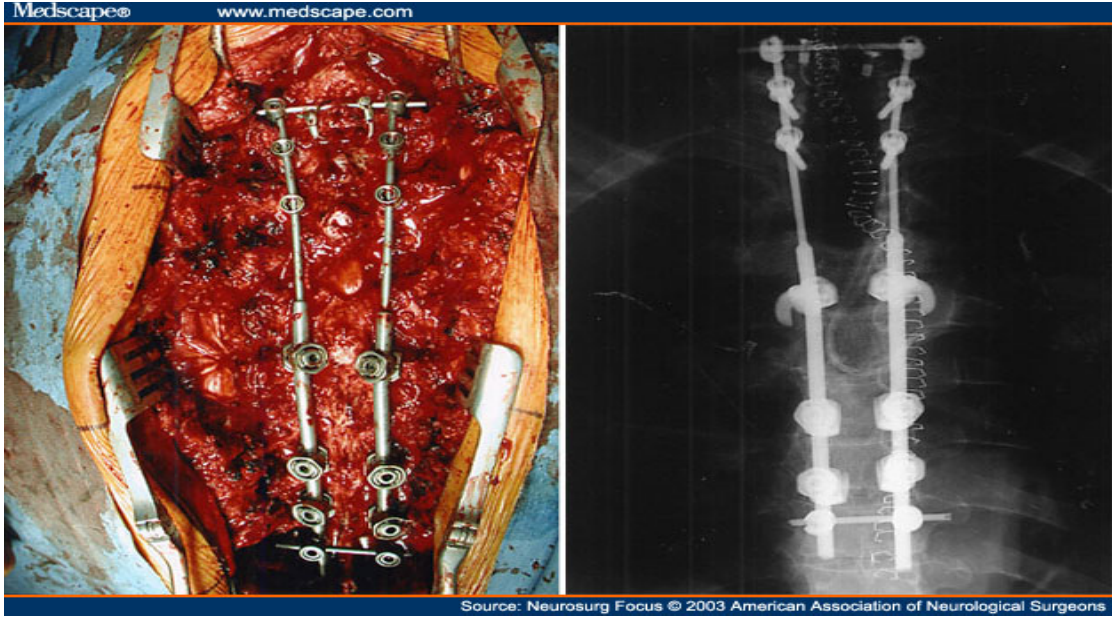
ALIF Implants

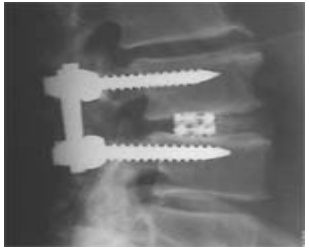
- Threaded Cage (cylindrical and tapered)
  - Titanium (+/- BMP)
  - Threaded bone dowels

- Trapezoidal Implant
  - Allograft
  - Titanium
  - PEEK

Screws and Rods







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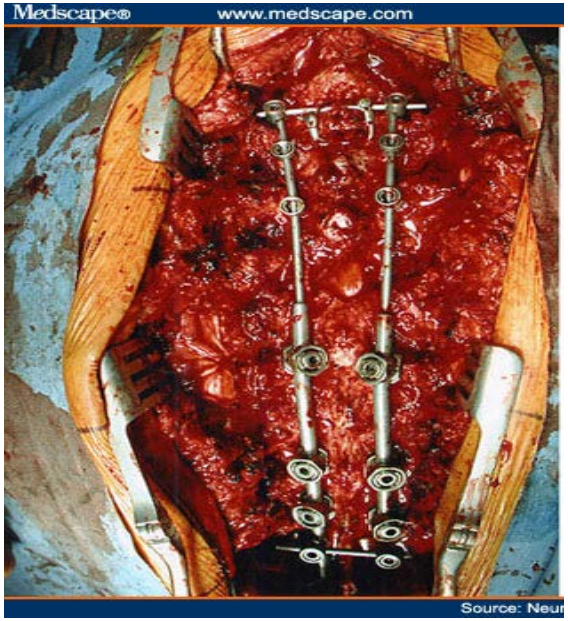
Minimally Invasive Options



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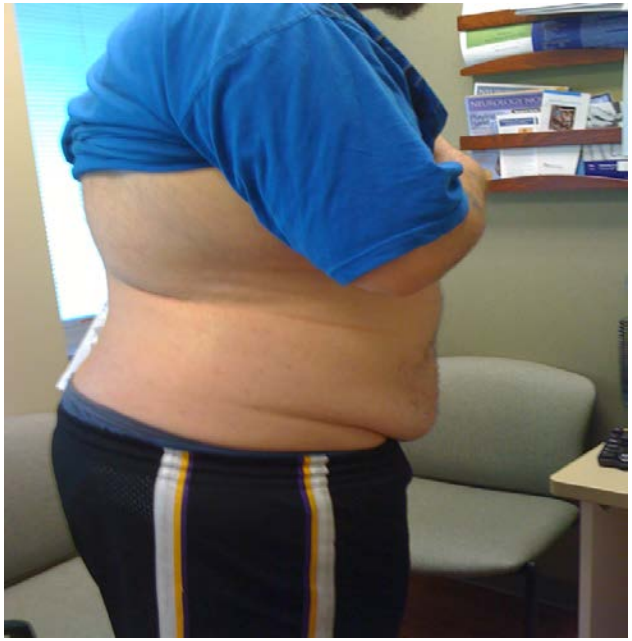
Minimally Invasive Options

360 pounds with disc



4 cm incision, almost no blood loss, 1 hour

Minimally Invasive Options

2 cm working channel

4 cm incision, 30 cc blood loss, 1 hr 20 mins

Conclusions

- Low back pain is COMMON
- Often resolves and no surgery is needed
- Your surgeon needs to explain to you WHY you need surgery
- Get 2nd opinions – ask for less invasive!

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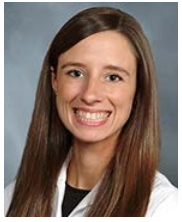

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