

# Pain management: An evolving specialty at the forefront of acute and chronic spine pain

J Kelby Hutcheson, MD


Carolinas Center for Advanced Management of Pain

Baptist Pain and Orthopedic Center

# Background

- Anesthesia residency @ MUSC
- Research Fellowship @ MUSC
- Pain Fellowship @ Emory
- Board Certified in Anesthesia and Pain Medicine





# Carolinas Center for Advanced Management of Pain

**[www.carolinapain.com](http://www.carolinapain.com)**

- Anesthesia, fellowship-trained pain MD's
- Physiatrist who does our emg's
- Offices in Greenville, Spartanburg, Greenwood, Clinton, Columbia, Asheville and Hendersonville, NC.
- Comprehensive Pain Management including injections, radiofrequency, spinal cord stimulators, medications, emg/ncs, pain psychology



# Baptist Pain and Orthopedic Center

- Offers comprehensive pain with anesthesia MD, physiatry, ortho, PT, OT, pain psychology on site
- Columbia, SC



# Outline

- Brief overview of Pain Management
- Role of Pain Management in acute and chronic pain
- Epidemiology of spine pain
- Conditions that benefit from pain management
- Treatment Options
- Evidence-based Treatment!
- Life after MMI?
- Case scenarios

# Definitions





# Chronic pain

- Pain that exists beyond an expected time frame for healing
- Pain which persists a month beyond the usual course of an acute disease or a reasonable time for any injury to heal that is associated with chronic pathologic processes that causes a continuous pain or pain at intervals for months to years.







# Chronic pain syndrome

- Complex pain condition with physical, psychological, emotional and social components.
- AMA 5<sup>th</sup> ed Guides to the evaluation of permanent impairment
  - Describes the condition of an individual who is markedly impaired by chronic pain with substantial psychological overlay
  - Largely a behavioral syndrome that only affects a minority of patients with chronic pain
  - Reflects the strong correlation between chronic pain and psychological disease



# Pain Management

- Physician(s) that diagnose, treat and coordinate other specialty referrals for patients in pain
  - Work closely with PT, psychologists, spine surgeons
  - Rely on diagnostic testing
    - MRI, CT, myelogram, Xray, and EMG/NCS
- Background
  - Mainly Anesthesia and physiatry, but also neurology, psychiatry depending on geographic location
  - Fellowship training is important
  - ACGME board certification is further validation



## ACGME Fellowship in Pain Medicine

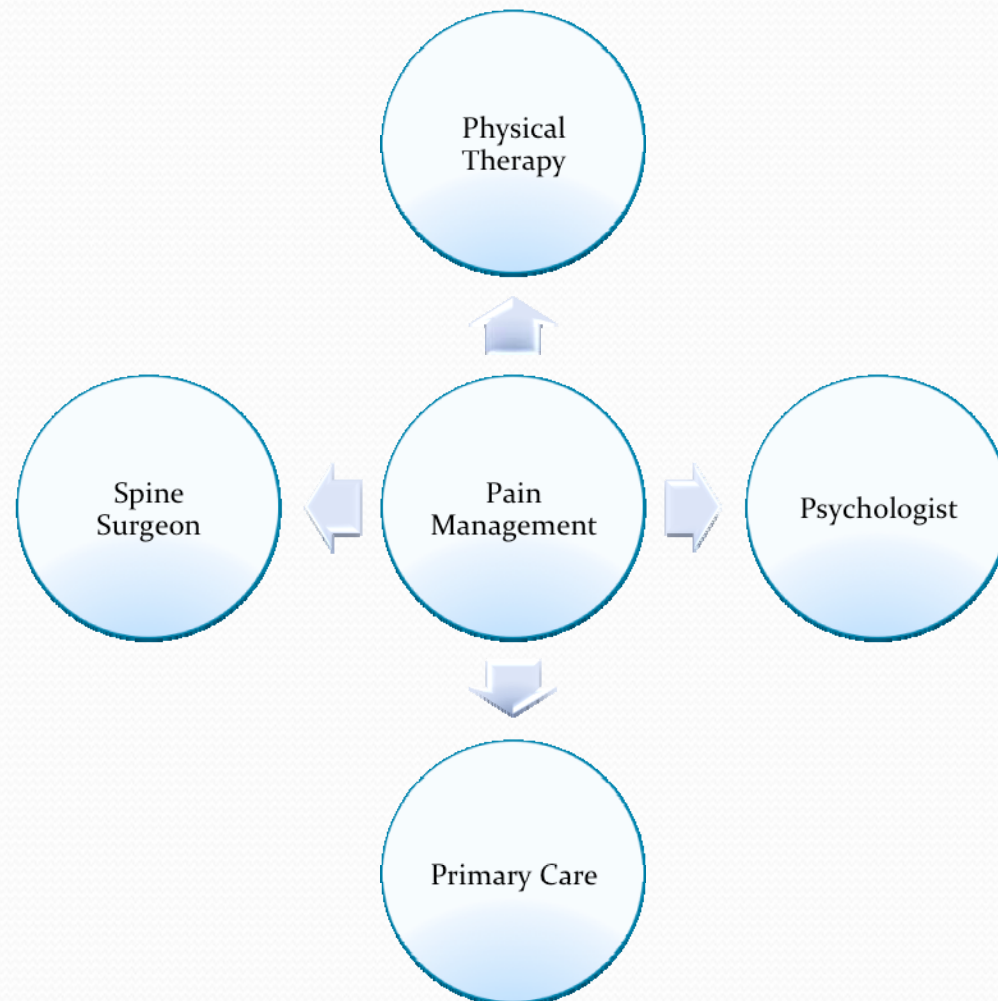
- 12 month training after residency specializing in the diagnosis, medical and interventional treatment of acute and chronic pain
- Leads to Board Certification in Pain Medicine that is recognized by ACGME and ABMS
- Currently residents from Anesthesiology, Physiatry, Neurology and Psychiatry may pursue fellowship training and board certification
- Board certification helps ensure competency

# Role of Pain Management

- Provide the leadership in the diagnosis, coordination of treatment, continuing care and long-term needs for the patient in chronic pain
- **Hub and spoke model**



# Hub and Spoke Model of Pain Treatment





# Role of Pain Management

- Evaluate patient- determine if they need physical therapy, psychological assessment, injections, medications and/or surgical evaluation.
- Continue to follow pain patient over time, periodically reassess diagnosis and treatment needs
- Putting the quality back into life

**Cornerstone of conservative management  
of spine and nerve pain**



# Limitations of Pain Management

- Delay in care
  - Often patient receives 1<sup>st</sup> assessment months after initial injury.
  - Goal should be 1-4 weeks depending on the condition
  - Facilitates diagnosis, treatment algorithm, and better navigation through needed referrals.
  - Data strongly supports quicker recovery with early treatment of acute pain and less progression to chronic pain



## Limitations in Pain Management

- If a patient has chest pain –they visit the ER, then they see their cardiologist, not the cardiothoracic surgeon
- In same way – after the initial primary care evaluation of the pain patient- they should be referred to pain management if condition persists
- Spine surgeons rely on conservative treatment to help determine when and if patients truly need surgery
  - Often send patient to pain management, PT, etc
  - Can save time by considering pain management 1st





# Limitations of Pain Management

- Recognition within the medical and workers compensation community may be limited
  - Education of treatment options is needed
  - Have seen modest improvement in recent years
- Poor communication between MD, WC, and patient of treatment plans, goals
  - Applaud case workers who attend office visits!
- MD May forget to keep MMI and work status on the radar



## Goals of Treatment

- Restoring function and quality of life while limiting side effects from treatment
- Hasten recovery
- Provide **cost-effective, evidence-based treatment** that has the greatest chance of success for each individual

# Epidemiology of Spine Pain





# Cost of Pain to American Business

- Pain has a significant adverse effect on work and productivity.
- 13% of the total workforce in the United States experienced a loss in productive time (a mean of 4.6 h/week) during a 2-week period due to a pain condition.
- Headaches, back pain, and arthritis = most common conditions.
- This loss in productive time among active workers costs employers an estimated \$61.2 billion per year.
- More than three-fourths of this lost productive time occurs in the form of reduced performance while employees are at work.



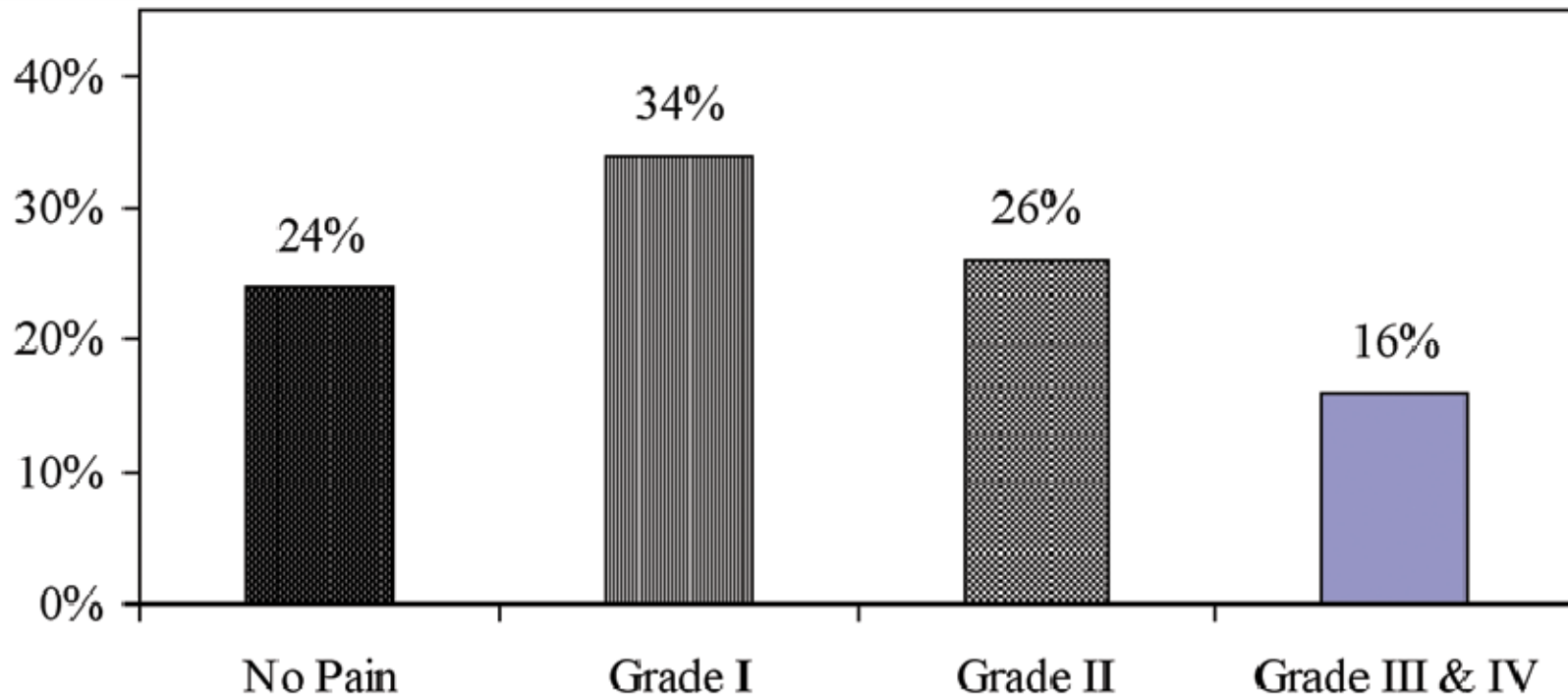
# Cost of Pain to American Business

- Each year, \$100 billion is spent on pain care,
- 40% of Americans experience daily pain,
- 50 million people with chronic pain
- 25 million people with acute pain.



# Epidemiology of spine pain

- Low back pain
  - Rates vary widely
    - Vary from 15-45%
    - 28% of US work force will experience disabling back pain at some point
    - 8% of entire working population will be disabled from back pain in any given year
    - Accounts for 40% of all lost work days
    - Incidence is increasing



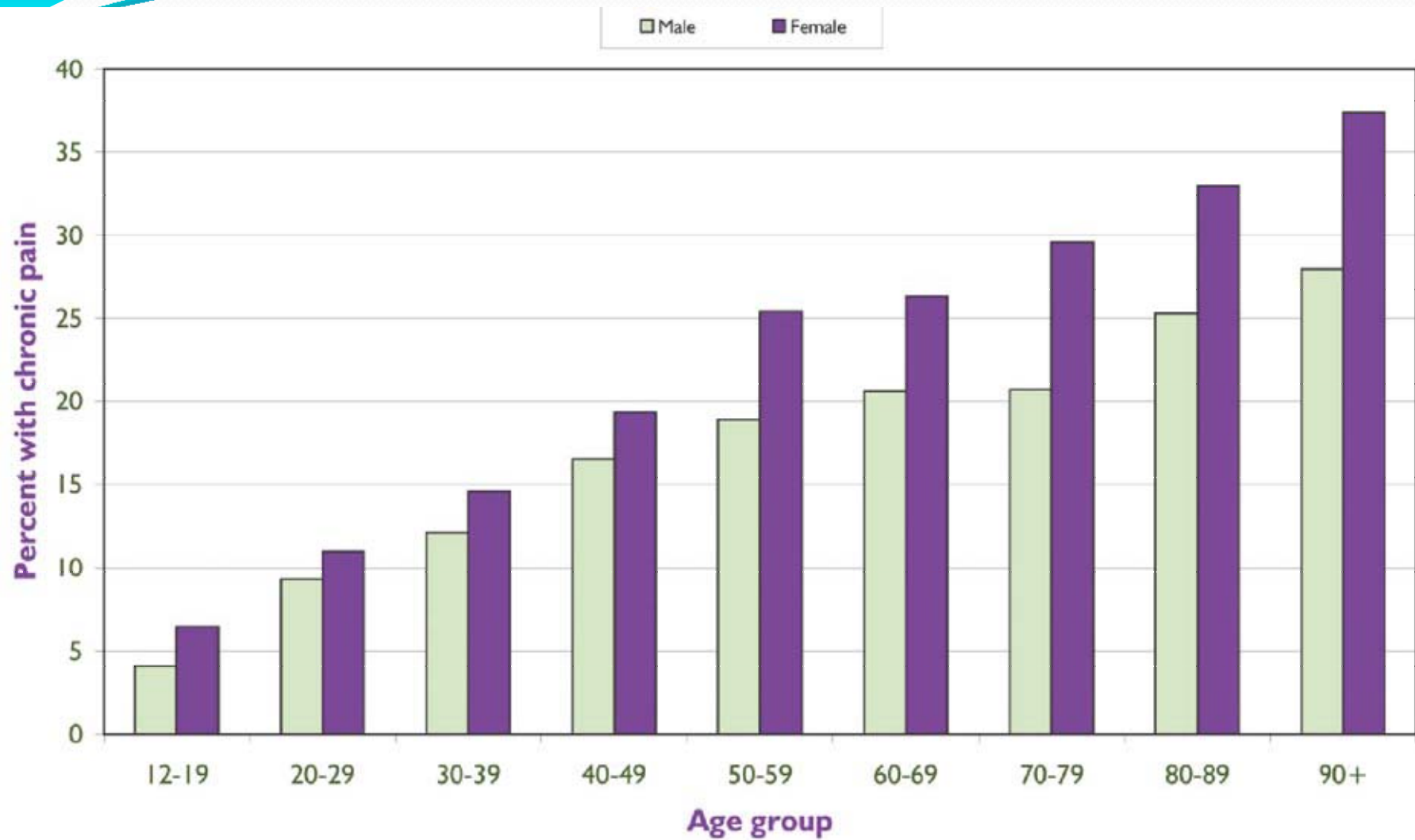
*Percentage distribution of the graded chronic pain scale scores by age category (years) (n = 1052) (10).*



# Epidemiology of spine pain

- Low back pain
  - Risk Factors-
    - Predominately psychosocial and occupational
    - Data suggests heavy duty jobs, driving, obesity, smoking, genetics, and age
  - Course and Prognosis
    - 80-90% are better in <6 weeks
    - Recurrence rates vary from 10-50% over next year.
    - 5-10% of patients develop persistent back pain





The prevalence of chronic pain by age and gender.



# Epidemiology of spine pain

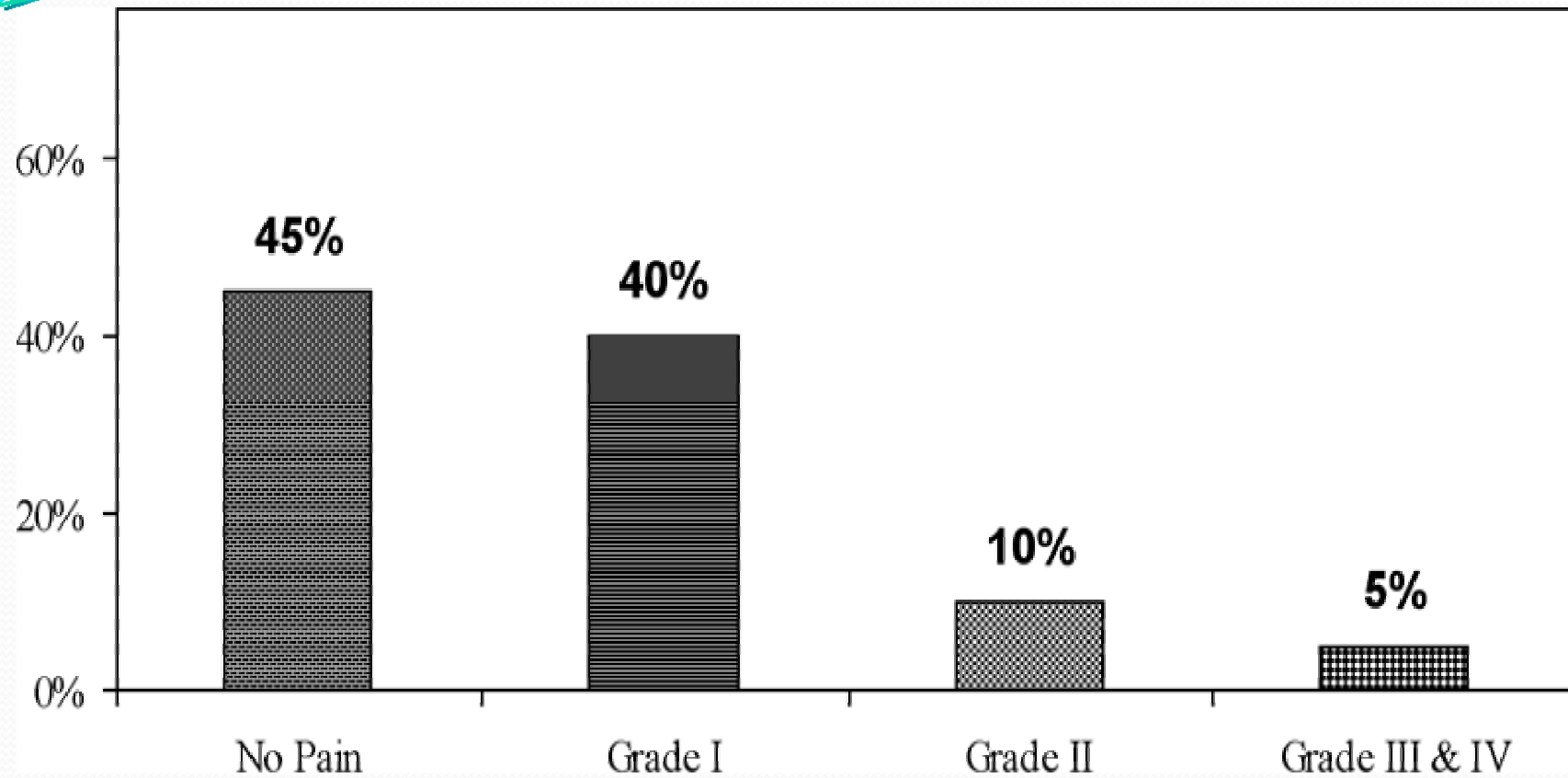
- Neck pain
  - Rates vary widely
    - Annual rate – 16.5% in spinning industry
    - Annual rate - 74% in crane operators
  - Risk Factors- still being studied
    - Little to no evidence to suggest modifying work stations and posture are effective at reducing incidence of neck pain
  - Course and Prognosis
    - Prolonged recovery in many patients
    - 50-75% of patients with neck pain will report pain 1-5 years later



**BAD POSTURE**

**EXAMPLES**

courtesy of The Cartoon Blog



Severity of neck pain (age standardized rate).



# Epidemiology of spine pain

- Thoracic Pain
  - Much less common than lumbar or cervical pain
    - Rates vary from 3-23% in studies
    - General population 13%, occupational rates 5%/year
    - Similar degree of disability compared to neck and back
  - Risk Factors
    - Perhaps sustained sitting
  - Course and Prognosis
    - Little evidence



# Conditions we can treat\*

- Spine pain
  - Lumbar disc herniations, stenosis, facet pain, SI joint, spondylolisthesis
  - Cervical facet pain, disc degeneration, herniation, stenosis, cervicogenic headaches
  - Thoracic facet pain, herniation, stenosis, disc pain, costovertebral joint pain, rib pain
  - CRPS/RSD
  - **Before and after spine surgery**
  - Advanced training allows treatment of cervical, thoracic and peripheral nerve conditions
- \*- slight variation exists based on MD training/skill set



# Treatment Modalities

- Physical Therapy
- Vocational Rehabilitation
- Pain Psychologist
- Medications
- Fluoroscopic-guided injections
- Neurolysis/radiofrequency nerve ablation
- Implantable Pain devices



# Physical Therapy

- Combines passive modalities and therapeutic exercises to improve function and range of motion
- Passive Modalities:
  - Heat/cold therapy, ultrasound, electrical stimulation, massage, joint mobilization
- Therapeutic Exercises:
  - Stretching, strengthening, postural modification







# Pain psychologist

- Integral in the diagnosis and treatment of anxiety and depression disorders associated with chronic pain and injury
  - **Psychological burden of chronic pain = loss of spouse**
  - Often help patients recover mentally so they can respond better to medications and procedures
- Dr. Tollison and Dr. Hinnant work in the Greenville, Spartanburg and Asheville offices
- Baptist has 2 full-time pain psychologists in Columbia





# Medications

- Several classes of medications are often used
  - Optimize relief @ lowest possible dose while minimizing side effects
- Acute pain
  - NSAID, muscle relaxant, oral steroid, opioid?



# Medications

- Chronic pain
  - Often add membrane stabilizer (lyrica/neurontin), SNRI anti-depressant (cymbalta, effexor),
  - Tricyclic antidepressant (elavil, pamelor, amitryptiline),
  - Topical (lidoderm, EMLA, Flector, Voltaren gel)



# Opioid Therapy: Drug Selection

- Immediate-release preparations
  - Used mainly
    - For acute pain
    - For dose determination during initial treatment of chronic pain
    - For “rescue” dosing
  - Can be used for long-term management in select patients



# Opioid Therapy: Drug Selection

- Extended-release preparations
  - Preferred because of improved treatment adherence and the sense of reduced risk in those with addictive disease
  - Morphine, oxycodone, fentanyl, hydromorphone, oxymorphone, tapentadol, buprenorphine



# Extended Release Preparations

- Should not be used in opioid naïve patients
- Are not first line medications
- Are inappropriate for acute self-limiting pain
- Should never be used prn
- Must be given on a time contingent, not need contingent basis
- Are not inherently abuse free





## Opioid Selection: Poor Choices for Chronic Pain

- Meperidine
  - Poor absorption and toxic metabolite
  - Recommended maximum dose  $\leq 700$  mg/24h
- Propoxyphene
  - Removed from market
- Mixed agonist-antagonists (pentazocine, butorphanol, nalbuphine, dezocine)
  - Compete with agonists  $\rightarrow$  withdrawal
  - Analgesic ceiling effect
  - Do not give to patients on chronic opioid therapy
    - Will precipitate withdrawal



# Adjuvant Analgesics

- Defined as drugs with other indications that may be analgesic in specific circumstances
- Numerous drugs in diverse classes
- Sequential trials are often needed



# Multipurpose Adjuvant Analgesics

## Antidepressants

- Best evidence: 3<sup>o</sup> amine TCAs (eg, amitriptyline)
- 2<sup>o</sup> amine TCAs (desipramine, nortriptyline) better tolerated and also analgesic
- Increasing evidence for SNRIs/atypical antidepressants (eg, duloxetine, venlafaxine, milnacipran, desvenlafaxine) and these are better tolerated yet



# Multipurpose Adjuvant Analgesics

Alpha-2 adrenergic agonists

- Clonidine and tizanidine used for chronic pain of any type
- Tizanidine usually better tolerated, but sedating
- Tizanidine starting dose 1–2 mg/d; usual maximum dose up to 40 mg/d



# Topical Adjuvant Analgesics

- Used for neuropathic pain
  - Local anesthetics
    - Lidocaine patch
    - Cream, eg, lidocaine 5%, EMLA
    - Capsaicin
- Used for musculoskeletal pains
  - NSAIDs
    - Voltaren, Pennsaid, Flector
    - Localized relief with less systemic side effects/risks



# Medication Tips

- Monitor prescription drug use
- Urine drug screens
- Narcotic agreement
- Pain psychologist- opioid risk assessment



# Medication monitoring

- SC DHEC Prescription Drug Monitoring Program
  - <https://scpmpph.hidinc.com/>
  - Lists controlled substance prescriptions that patient has filled in last 1-2 years
  - 2-4 week lag time
  - Similar program available in North Carolina



# Medication monitoring

- Urine drug screens
  - Variety of companies offer this service (Aegus, Ameritox, etc)
  - Monitor if patient is taking medication as rx'd
  - Monitor if patient taking medication from other sources
  - Monitor use of illegal substances





# Narcotic Agreements

- Patient agrees to follow prescribed treatment plan
- Only obtain pain medications (and/or controlled substances) from one practice
  - We allow exceptions for surgery, rare ER visits
- Will not overtake medication without permission or divert their medication
- Agrees to routine urine drug test
  - Avoid “random”



# Pain Psychologist

- **Worth their weight in gold!**
- 2 in our Greenville and Spartanburg offices
- 2 @ Baptist Pain Center
- Offer Opioid Risk assessment
  - Helps identify psychological, addiction and behavioral traits that make opioids a poor choice
  - Consider for anyone you might leave on opioids more than 3 months

# Fluoro-guided Injections





# Fluoro-guided Injections

- Several uses
  - Aid Diagnosis
    - If I inject numbing medication on a nerve and pain goes away, we know what is causing the pain
  - Facilitate Treatment
    - Often injections reduce pain and inflammation such that patient can more fully participate in PT or voc rehab
  - Therapeutic Benefit
    - Reduction of pain for weeks to months restores ADL's, Quality of life, and normal function



# Types of injections

- Epidural steroid injections
  - Interlaminar vs transforaminal
- Intra-articular facet injections
  - Diagnostic medial branch blocks
- Sacroiliac Joint injections
- Nerve Block (may use U/S, fluoro)
  - Ex-Occipital nerve block
- Radiofrequency ablation/Neurolysis

# Implantable Pain Devices

- Spinal Cord Stimulation
  - “pacemaker for pain”
  
- Intrathecal pump
  - “pain pump”





# Evidence-Based Care

- Very important consideration in medical practice
- Very good studies on medications for pain
- Studies on Pain interventions are fraught with design challenges
  - placebo vs active control
  - How to adequately blind patient and MD
  - Accounting for severity of disease
  - Academic vs private setting
  - Multi-center vs single center
  - Exclusion of other pain conditions
  - Long-term follow-up

# Level of Evidence

## US Preventive Services Task Force

<b>I</b>	<b>Evidence obtained from at least one properly randomized controlled trial</b>
II-A	Evidence obtained from well-designed controlled trials without randomization
II-B	Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group
II-C	Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence
III	Opinions of respected authorities, based on clinical experience descriptive studies and case reports or reports of expert committees



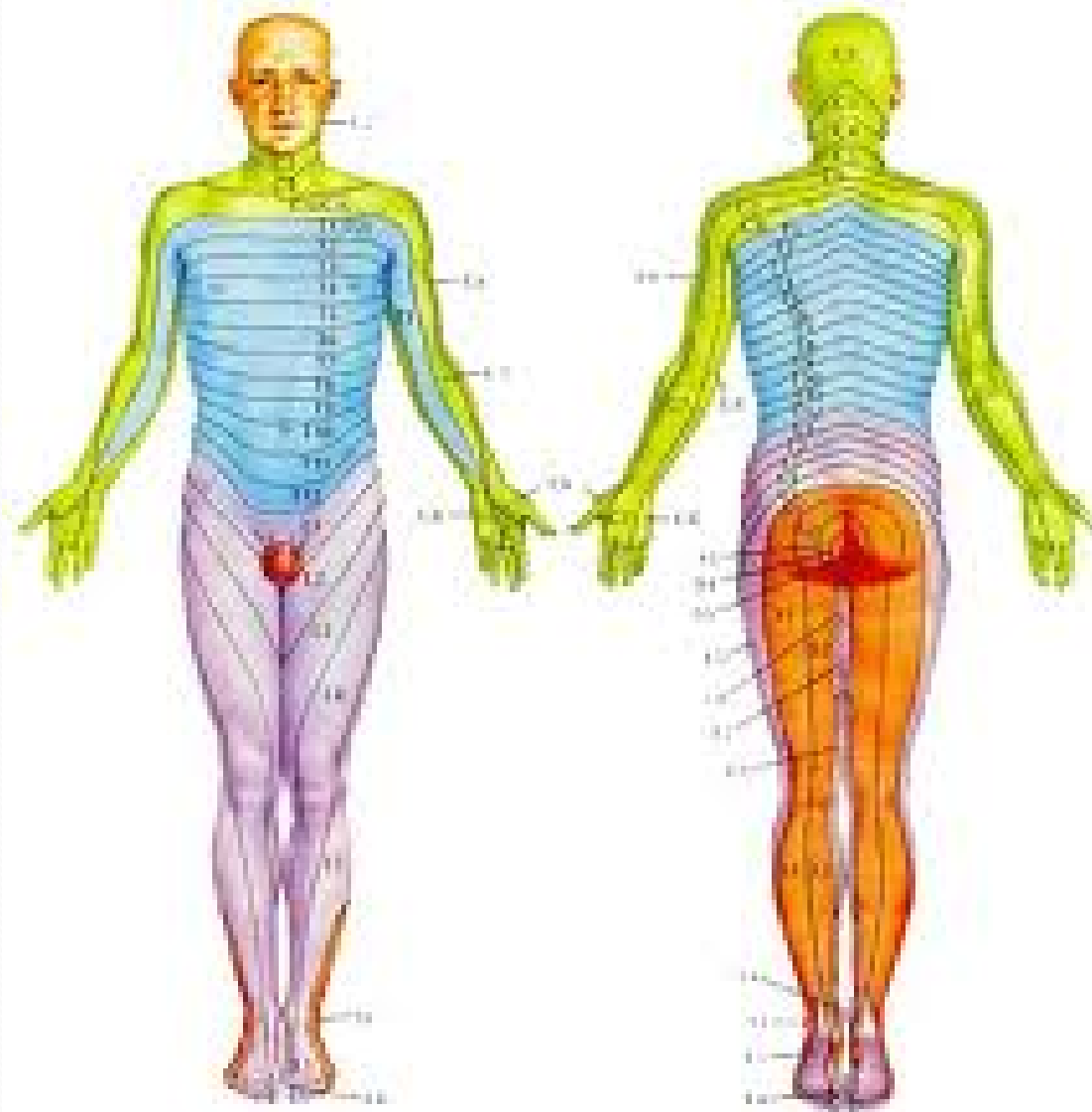


# Diagnosis of back pain

- Careful review of patient history
  - Acute onset of back and leg pain in dermatomal fashion vs gradual onset over months of aching back pain
- Evaluation of diagnostic testing
  - Emg/ncs – evidence of nerve damage
  - MRI – disc herniation or tear
  - Xray- end plate changes, instability with movement
  - CT – stability of surgical hardware, facet joint changes
  - CT Myelogram- has benefits of CT and MRI

# Diagnosis of back pain

- Thorough physical examination
  - Provocative maneuvers, palpation, neurological exam, range of motion
- Experienced clinician uses above information to make best determination of origin of spinal pain
  - Then creates most appropriate treatment plan
- Some pain conditions are easier to diagnose
  - i.e. **radicular pain**



# Diagnosis of back pain

- Some pain conditions are more complex, and need further testing to become more accurate
  - History, imaging and physical exam have 15% diagnostic accuracy in axial pain
- Rely on diagnostic injections to rule in or out source of pain
  - Increase diagnostic accuracy to 85% for axial back pain



# Steps to treat pain?

- Determine diagnosis
- Acute vs Chronic (or both)
- Diagnostic and therapeutic injections
- Medication selection
- Use of Physical therapy as needed
- Appropriate Imaging
- Referral to surgeon
  - ? Any neuro deficit?
- Coordinate long-term treatment plan



# Sources of back pain

- Major contributors to back pain
  - Disc pain (discogenic, degenerative disc)
  - Facet arthropathy (arthritis)
  - Spinal stenosis
  - Sacroilitis
  - Sciatica (nerve root irritation, radiculopathy)
  - Failed Back Surgery Syndrome
- ? Does the pain radiate down the leg

# Axial Back pain



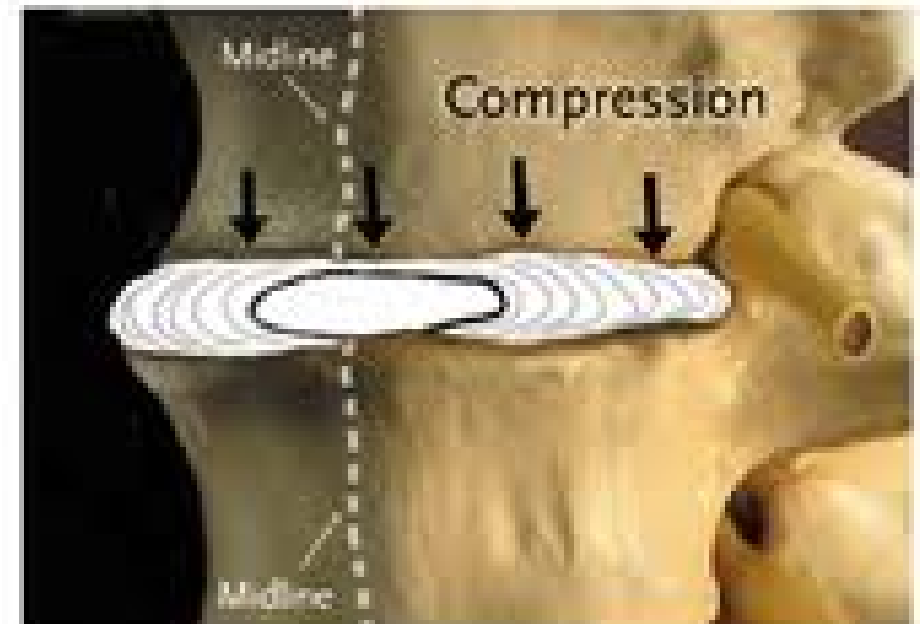
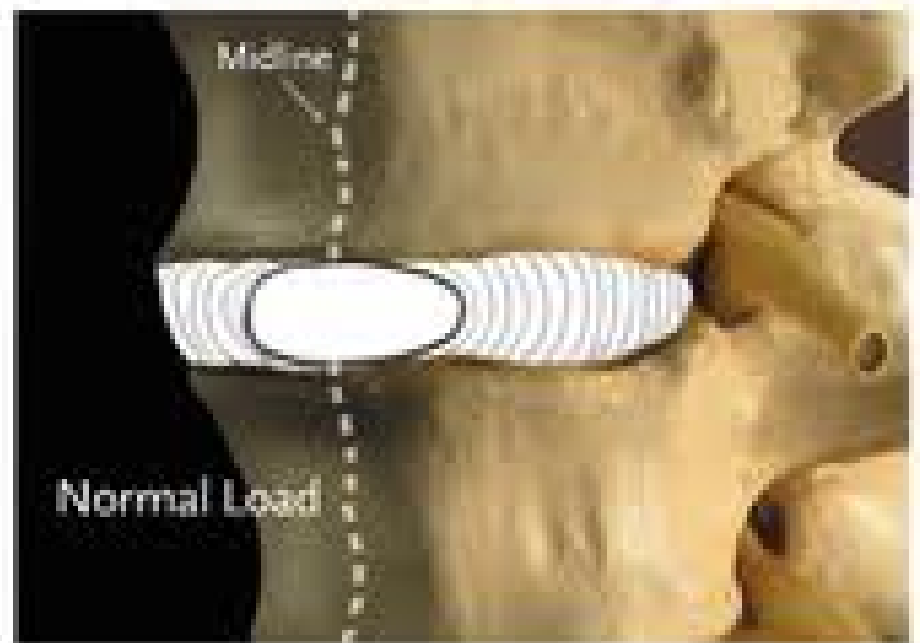
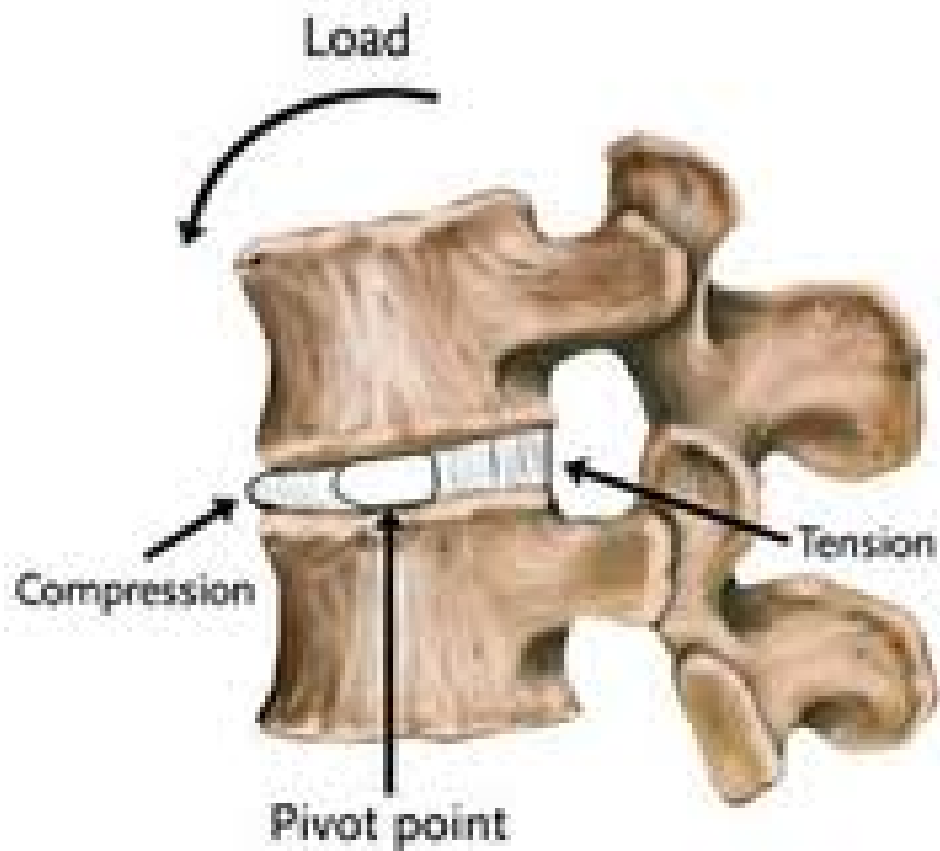


# Discogenic Pain

- Gradual disc degeneration due to repeated trauma, endplate fractures, tear in disc annulus.
- Presents as deep, aching, belt-like back pain, worse with flexion, worse with mechanical loading- sitting, lifting, standing too long



## Repeated trauma/injury





# Discogenic Pain

- Imaging may show loss of disc height, bulge, loss of water (appears darker on mri), annular tear, and eventually endplate changes
- Diagnostic test:
  - Provocative Discography is an option
- Treatment
  - Conservative - Meds, PT, TENS, Back brace, epidural steroid injections, evaluate for facet pain
  - Surgical – FUSION
  - Can lead to moderate to severe back pain

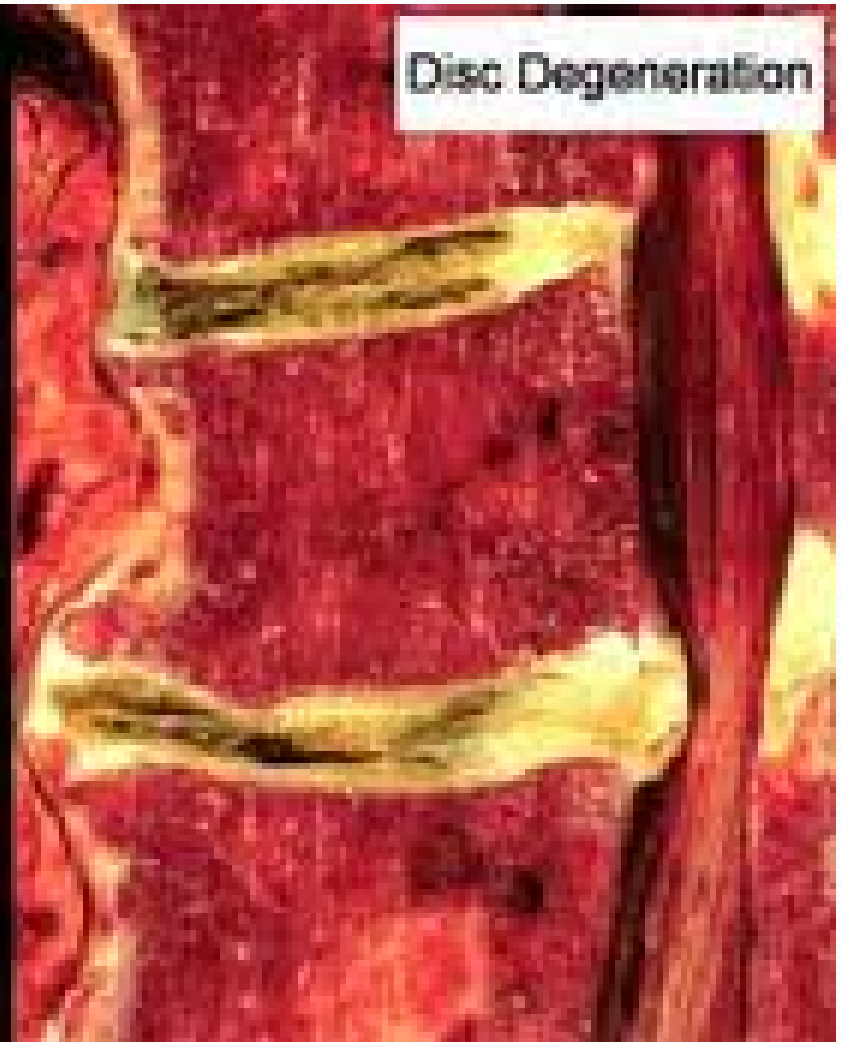


The black disc in this MRI indicates that the disc has a low water content. This is commonly seen in DDD patients.



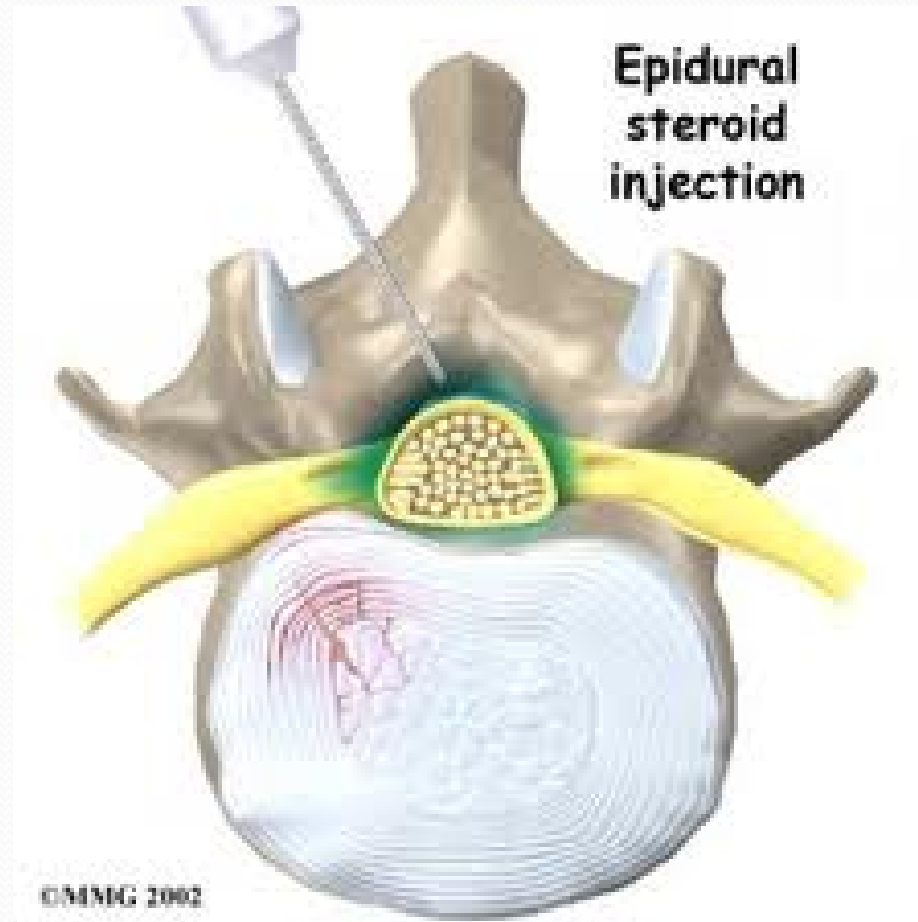


Normal Discs



Disc Degeneration

# Epidural Steroid injection



# ESI for discogenic pain

Table 8. Results of randomized and observational studies of effectiveness of caudal epidural steroid injections in managing discogenic pain.

Study	Study Characteristics	Methodological Quality Scoring	Participants	Pain Relief			Results	
				3 mos.	6 mos.	12 mos.	Short-term relief $\leq$ 6 mos.	Long-term relief $>$ 6 mos.
Manchikanti et al 2008 (260)*	RA, DB	72	64	78%	75% to 81%	72%	P	P
Manchikanti et al 2001 (262)*	O	76	70	95%	85%	61% to 73%	P	P
Manchikanti et al 2002 (261)*	O	73	62	86%	60%	NA	P	NA

\*Indicates use of fluoroscopy

RA = randomized; DB = double blind; O = observational; NA = not available; P = positive; N = negative

# Level of Evidence

## US Preventive Services Task Force

<b>I</b>	<b>Evidence obtained from at least one properly randomized controlled trial</b>
II-A	Evidence obtained from well-designed controlled trials without randomization
II-B	Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group
II-C	Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence
III	Opinions of respected authorities, based on clinical experience descriptive studies and case reports or reports of expert committees



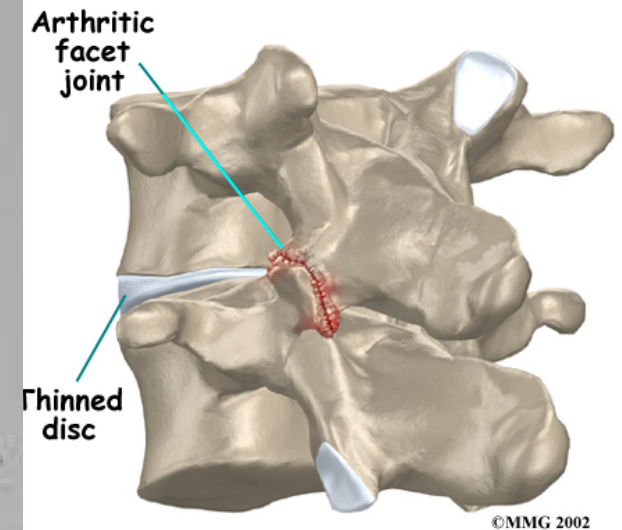
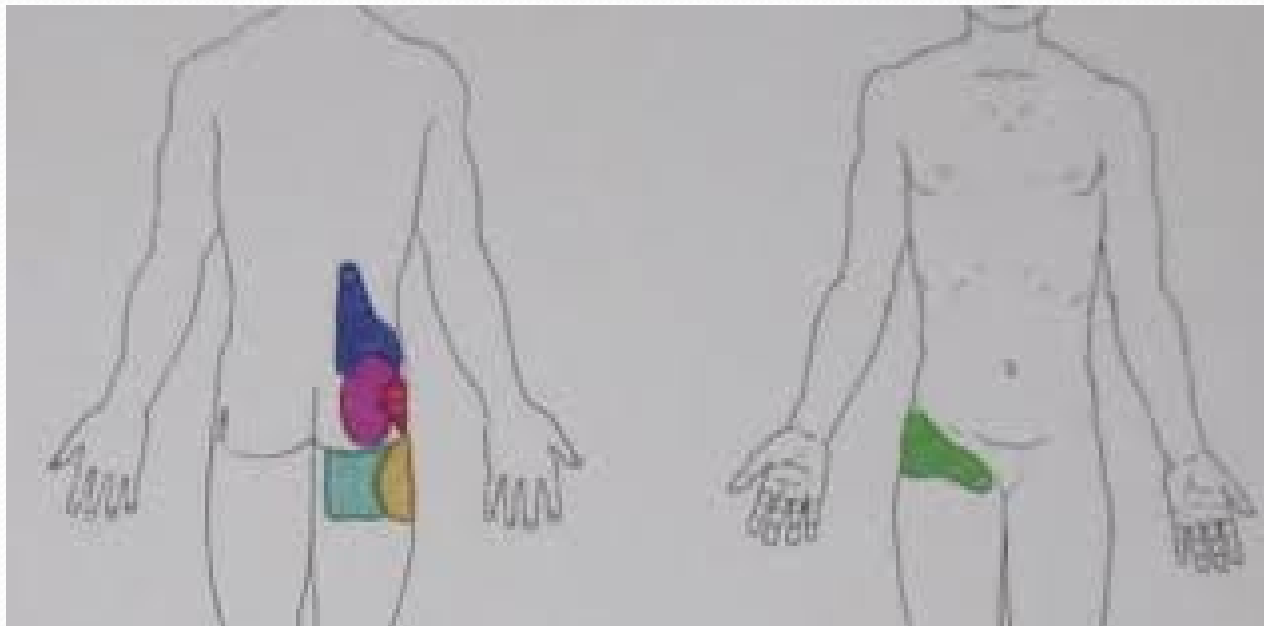
# Level of Evidence

- Level I evidence for ESI to achieve short-term and long-term relief in patients with discogenic pain
- Cost-effectiveness
  - 1 QALY = \$2927-6024 USD depending on study cited and technique (transforaminal vs caudal vs interlaminar)



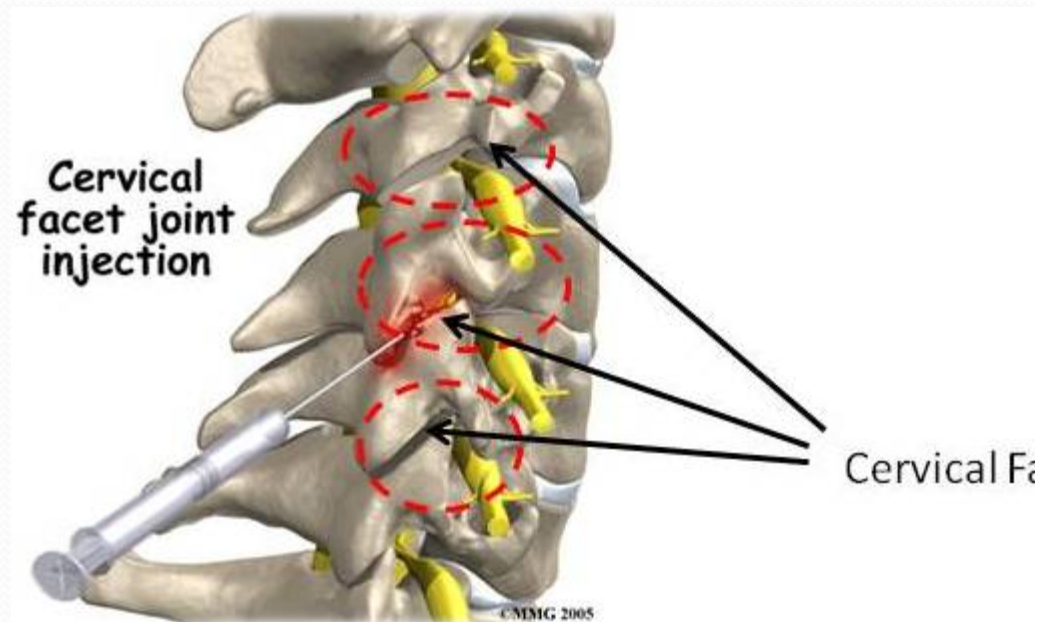
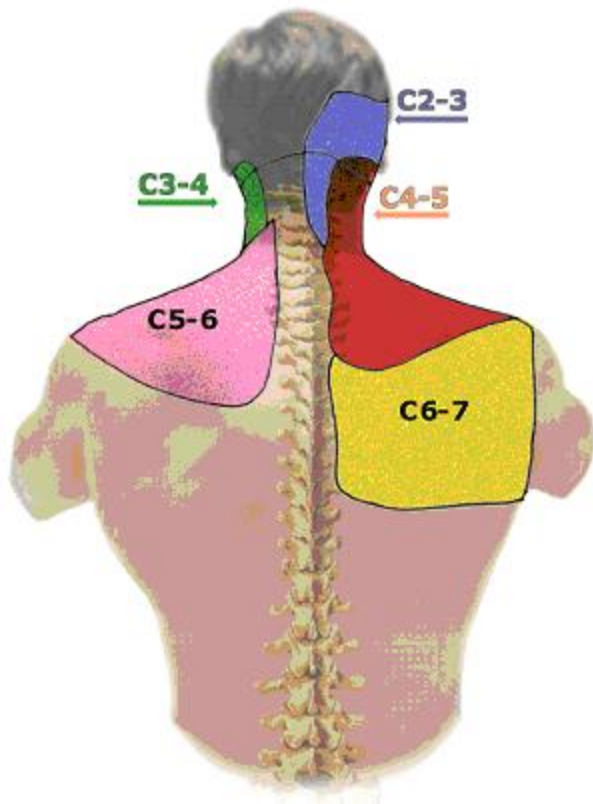
# Facet Pain

- Back pain worsened by extension/rotation
  - May refer in non-dermatomal fashion
    - Buttock, hip, posterior thigh



# Facet Pain

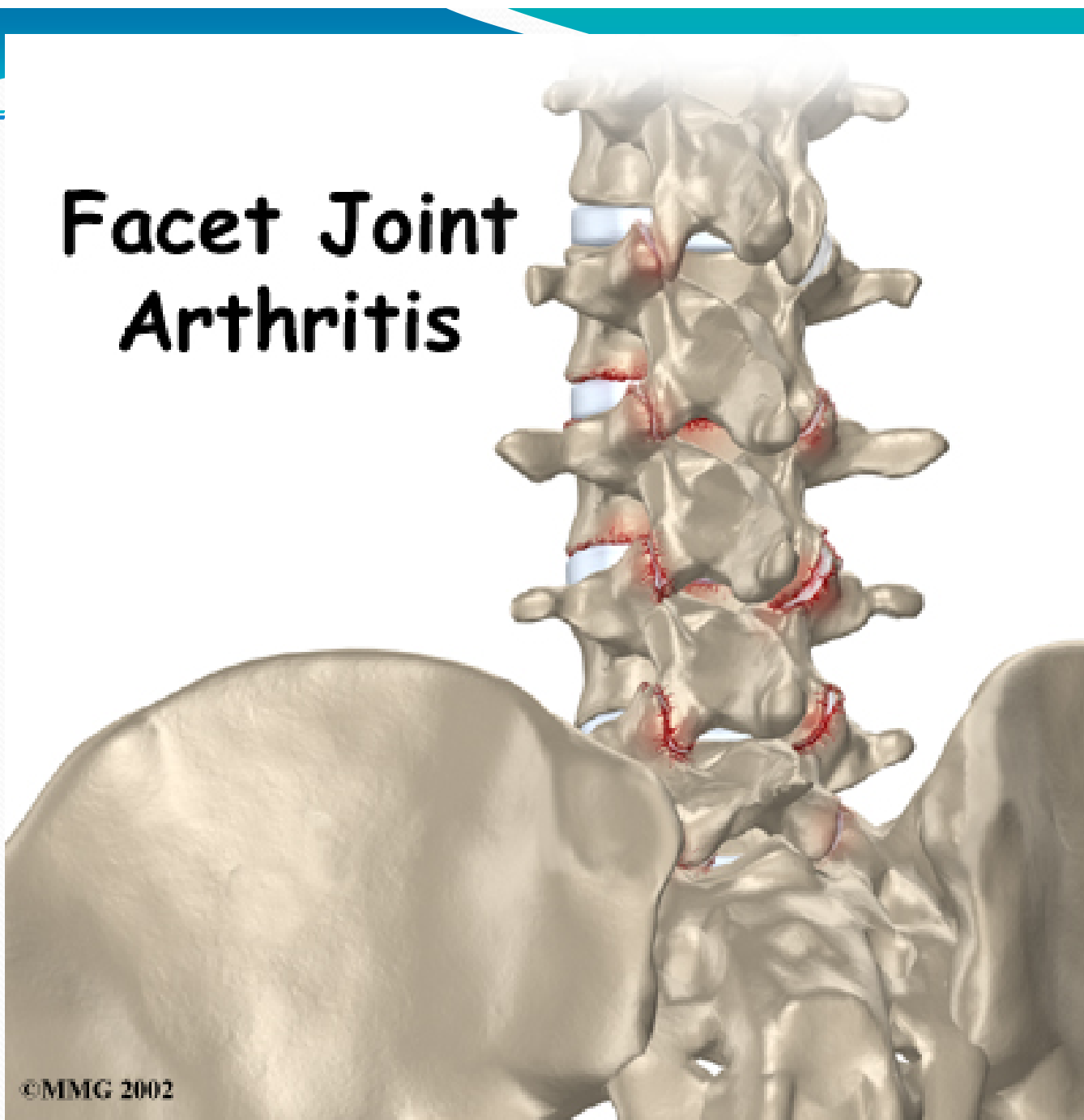
- Neck pain worsened by extension/rotation
  - May refer in non-dermatomal fashion



# Facet

- Imaging:
  - Xray, CT, MRI
    - May show facet edema, arthropathy, or may be normal
- Diagnosis
  - Confirmed by facet injection or medial branch nerve block

# Facet Joint Arthritis



# Facet Joint Injection



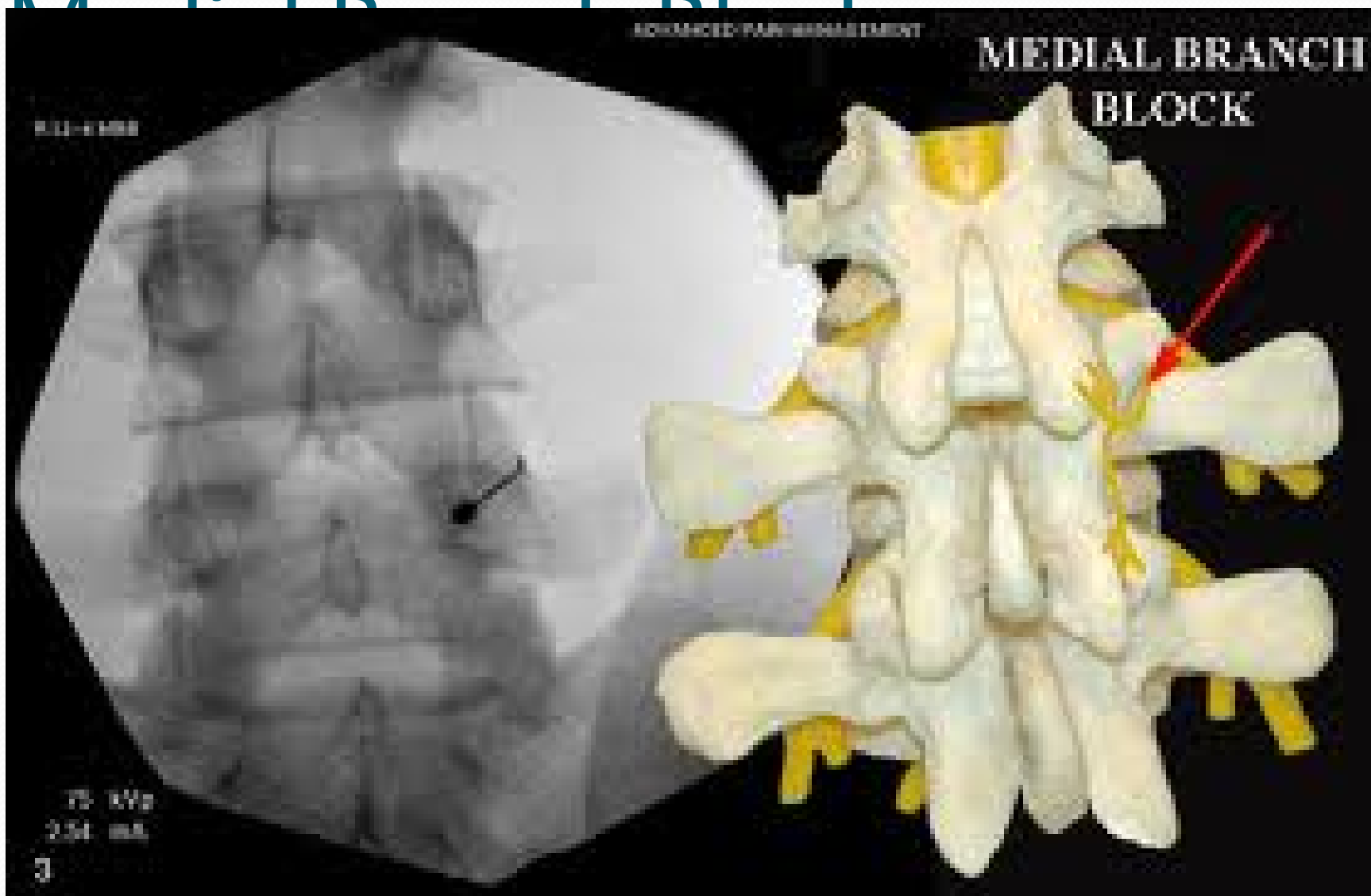


# Facet

- If temporary relief from facet joint injection
  - Consider longer-term treatment
- Consider neurolysis or denervation of the facet joint
  - Medial branch of the dorsal root ganglion innervates the joint
  - Can use radiofrequency to alleviate pain for 6-12 months
  - Perform diagnostic medial branch block 1st



# Multidisciplinary Block





# Evidence for facet blocks

- II-A or II-B
  - Strong evidence supports diagnostic and therapeutic value of facet blocks
- Cost-Effectiveness
  - 1 Quality of Life year saved = 3,461 USD
  - Similar to other injection therapies
  - Far less expensive than intrathecal pump, lumbar decompression or fusion



Study	Study Characteristics	Methodological Quality Score(s)	No. of Patients	Initial Relief	Long-term Relief		Results	
				< 6 weeks	3 mos.	6 mos.	Short-term relief ≤ 6 mos.	Long-term relief > 6 mos.
<b>CERVICAL</b>								
Manchikanti et al 2008 (182)	RA, DB	76	76	83% vs 85%	87% vs 95%	85% vs 92%	P	P
Manchikanti et al 2004 (187)	O	69	100	92%	82%	56%	P	P
<b>THORACIC</b>								
Manchikanti et al 2008 (183)	RA, DB	60	Group I-no steroid = 24 Group II-steroid = 24	79% vs 83%	79% vs 81%	79% vs 79%	P	P
Manchikanti et al 2006 (188)	O	69	55	71%	71%	76%	P	P
<b>LUMBAR</b>								
Manchikanti et al 2008 (184)	RA, DB	73	Group I-no steroid = 60 Group II-steroid = 60	83% vs 82%	83% vs 93%	82% vs 85%	P	P
Manchikanti et al 2001 (181)	RA	59	73	100%	82%	21%	P	P

# Radiofrequency

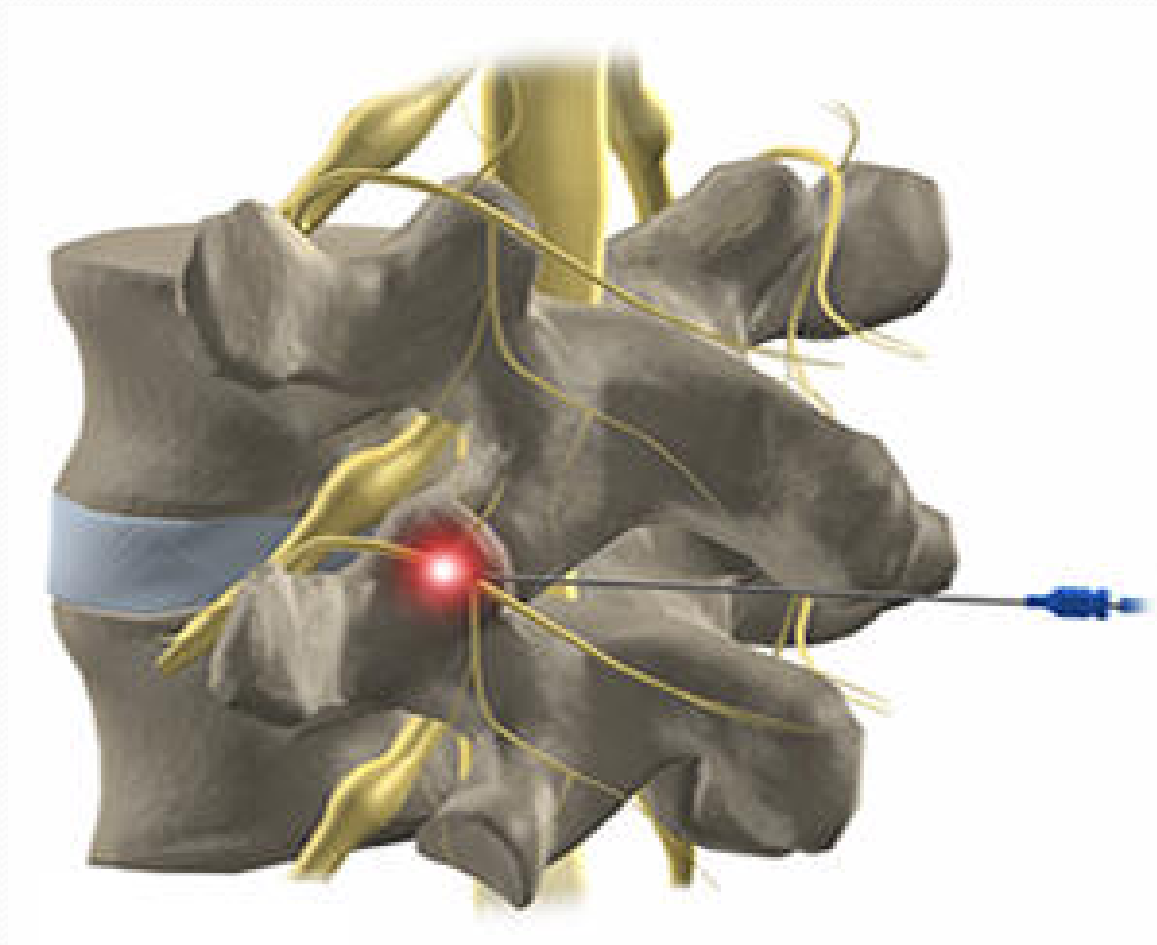


Table 4. *Published results of studies of cervical and lumbar facet joint nerve neurotomy.*

Study	Study Characteristics	Methodological Quality Score(s)	Number of Patients	Pain Relief (months)		Results	
				6 mos.	12 mos.	Short-term relief ≤ 6 months	Long-term relief > 6 months
<b>CERVICAL</b>							
Lord et al 1996 (193)	RA,DB	67.	24	1 of sham / of active	58% in active treatment group	P	P
Sapir and Gorup 2001 (208)	O	87	46	NA	Mean VAS change 4.6 ± 1.8	P	P
McDonald et al 1999 (209)	O	65	28	NA	71%	P	P
Barnsley 2005 (202)	O	54	35	NA	74%	P	P
<b>LUMBAR</b>							
Nath et al 2008 (201)	RA,DB	50	20-control 20-active	SI	NA	P	NA
Gofeld et al 2007 (221)	O	63	174	68%	NA	P	P
Dreyfuss et al 2000 (212)	O	73	15	87%	87%	P	P

RA = randomized; DB = double blind; O = observational; NA = not available; SI = significant improvement; VAS = visual analog scale; P = positive; N = negative



# Facet Radiofrequency

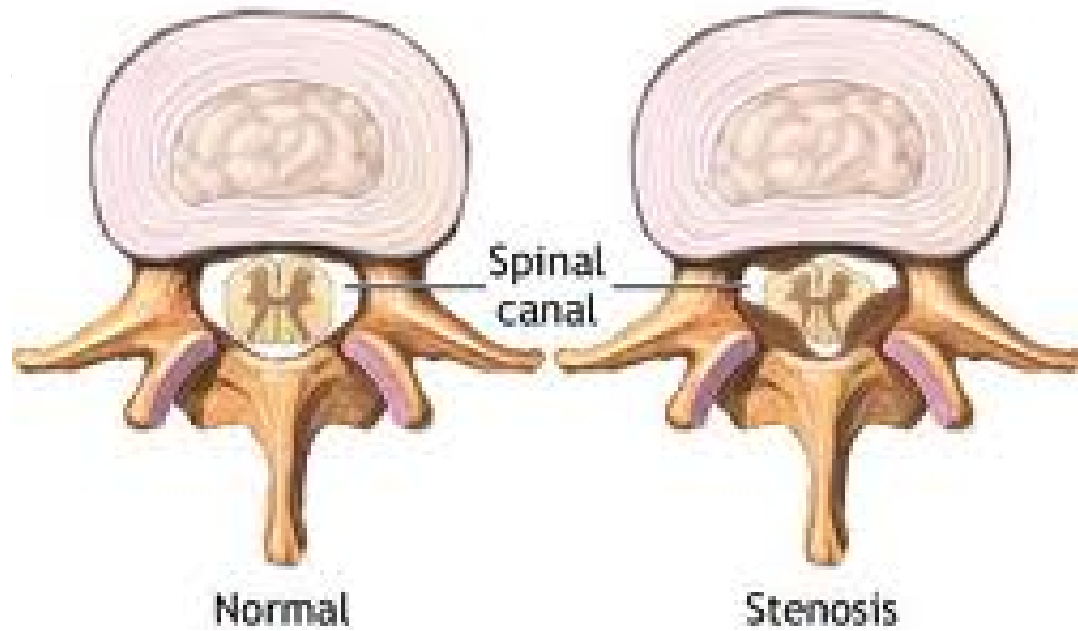
- Indications:
  - Temporary relief from facet/medial branch blocks
- Results:
  - 6-12 months relief of facet pain
- Level of Evidence
  - Cervical RF – II-A
  - Lumbar RF – II-B



# Spinal Stenosis

- Narrowing of the central canal, lateral recess or neural foramen
- Age usually >50 years
- Degenerative process
- Factors associated
  - Facet joint hypertrophy
  - Disc bulge, disc height loss
  - Ligamentum flavum hypertrophy
  - osteophytes

Spinal stenosis is a narrowing of the spinal canal



ADAM

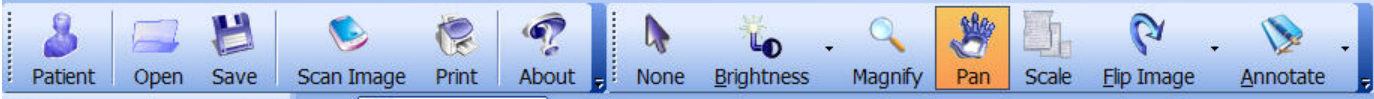




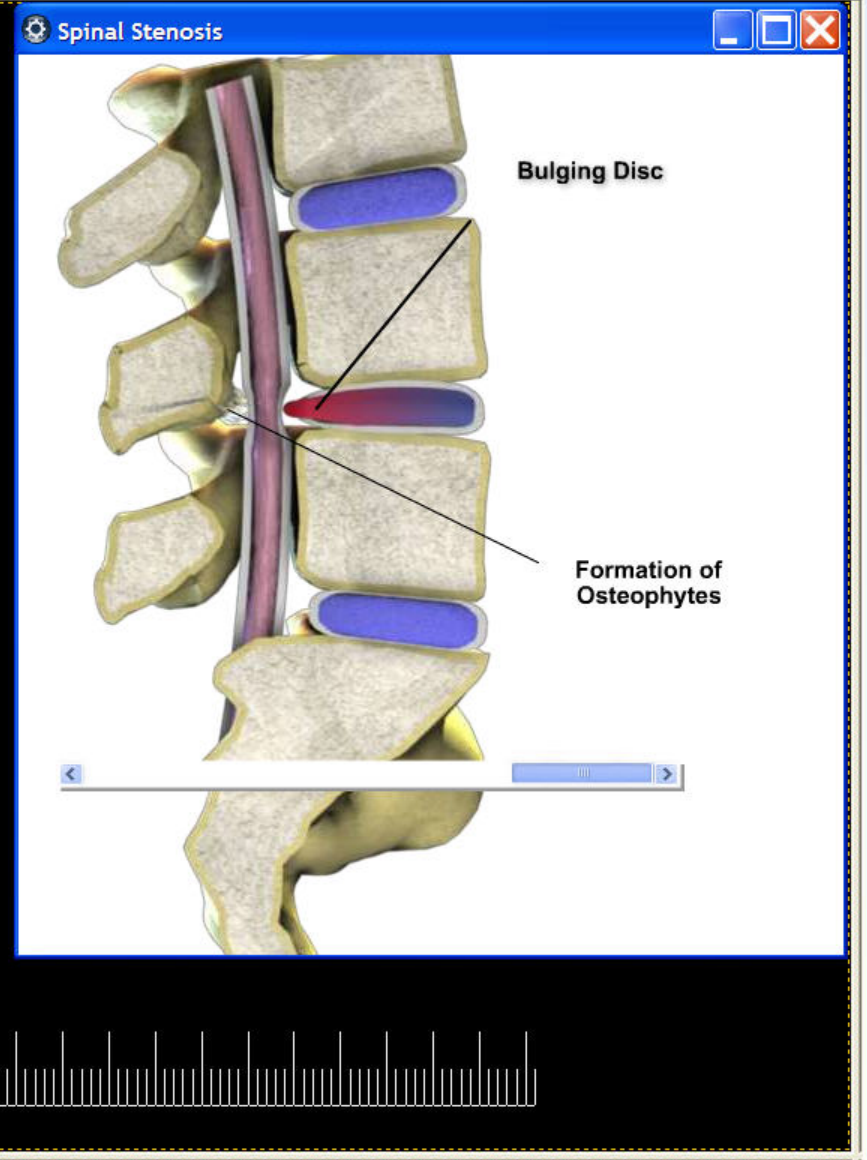
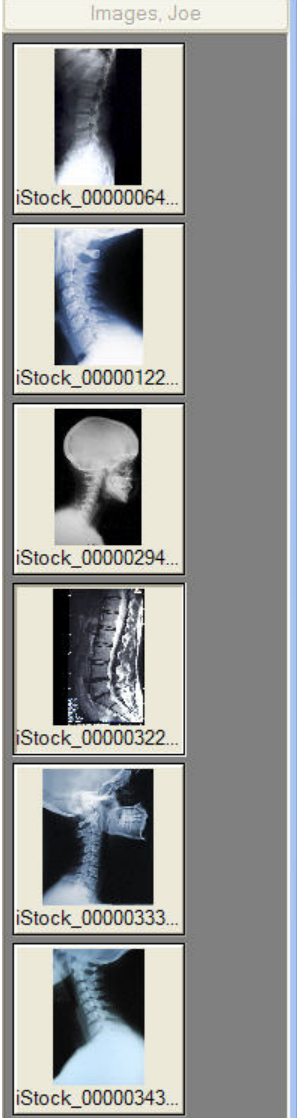
# Spinal Stenosis

- Gradual onset back discomfort with standing, may involve legs.
- Classic picture of older woman bent over shopping cart
- Neurogenic claudication
  - Pain in back/leg relieved with sitting or leaning forward
- Imaging- MRI/Myelogram
  - Shows narrowing of central canal, lateral recess or neural foramen

File Edit View Image Window Help



Images Images, Joe

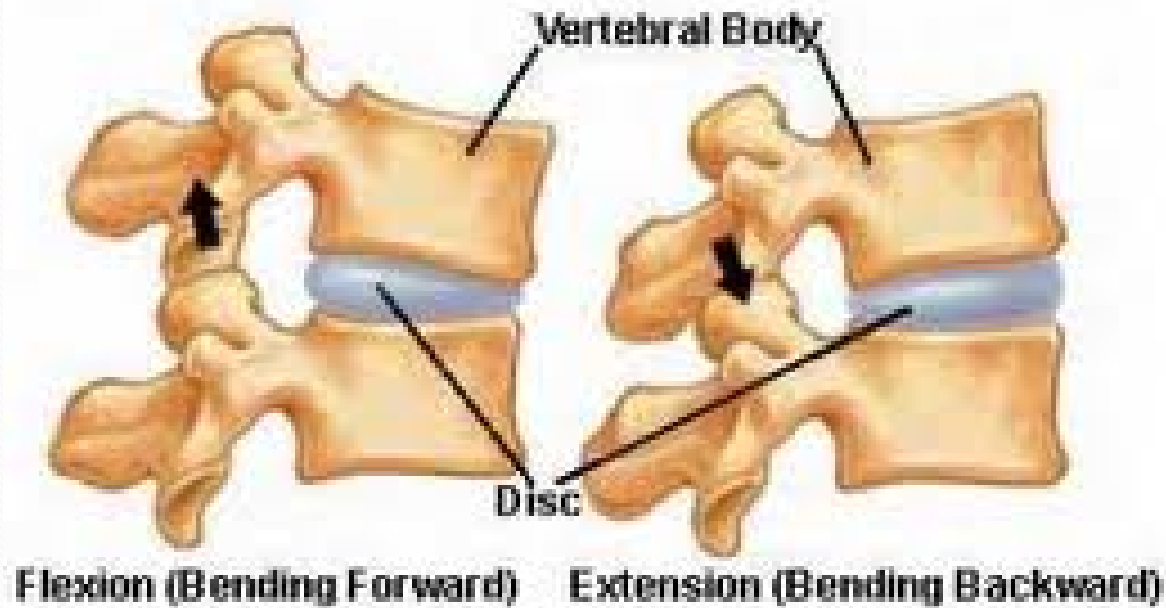


Patient Education Properties



Bending forward often alleviates pain in spinal stenosis  
Increases the canal and foraminal space  
Alleviates neural compression

## Facet Joints in Motion





# Spinal Stenosis

- Treatment
  - Conservative: rest, meds, PT (flexion or neutral positioned program), aquatic therapy, epidural steroid injections
  - Surgical options:
    - Decompression, possible fusion (less likely with advanced age),
    - Spinal Cord Stimulation – less invasive option especially with multilevel stenosis

# ESI in spinal stenosis

Table 7. Results of effectiveness in evaluation in managing spinal stenosis.

Study	Study Characteristics	Methodological Quality Scoring	Participants	Pain Relief			Results	
				3 mos.	6 mos.	12 mos.	Short-term relief ≤ 6 mos.	Long-term relief > 6 mos.
Manchikanti et al 2008 (254)*	RA, DB	70	40	50% to 65%	60% to 65%	55% to 65%	P	P
Ciocon et al 1994 (255)	O	57	30	SI	SI	NA	P	NA
Botwin et al 2007 (258)*	O	61	34	65%	62%	54%	P	P

\*Indicates use of fluoroscopy

RA = randomized; DB = double blind; O = observational; NA = not available; SI = significant improvement; vs = versus; P = positive; N = negative



# Level of Evidence

- Level II-A or II-B for ESI use in spinal stenosis



# Sacroiliac Joint Pain

- Acute or gradual back, buttock or leg pain (posterior thigh to knee)
- Worse with sitting, walking up stairs or ramp
- Usually has tenderness over SI joint (PSIS)
- Crossing leg on knee (patrick's test) usually reproduces pain

# SI joint pain pattern

**Sacroiliac  
Joint  
Dysfunction**



©MNIIG 2005



# SI joint

- Imaging:
  - Xray, CT, MRI – may show djd
- Diagnosis
  - Injection confirms diagnosis
- Treatment options:
  - Rest, medications, PT, manual therapy, SI joint injections



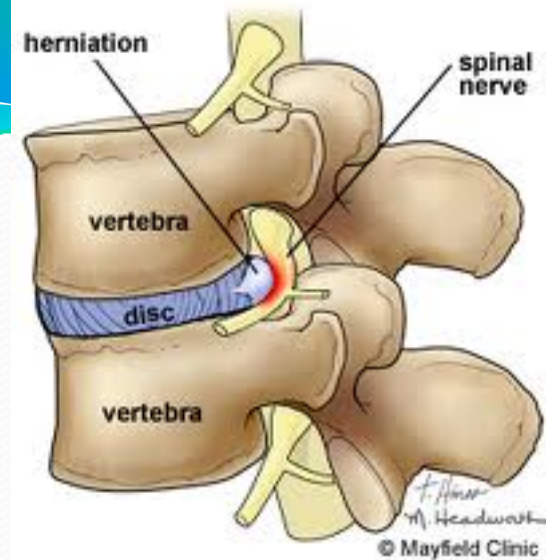




# Level of Evidence

- Studies poorly designed
- No cost effectiveness data available

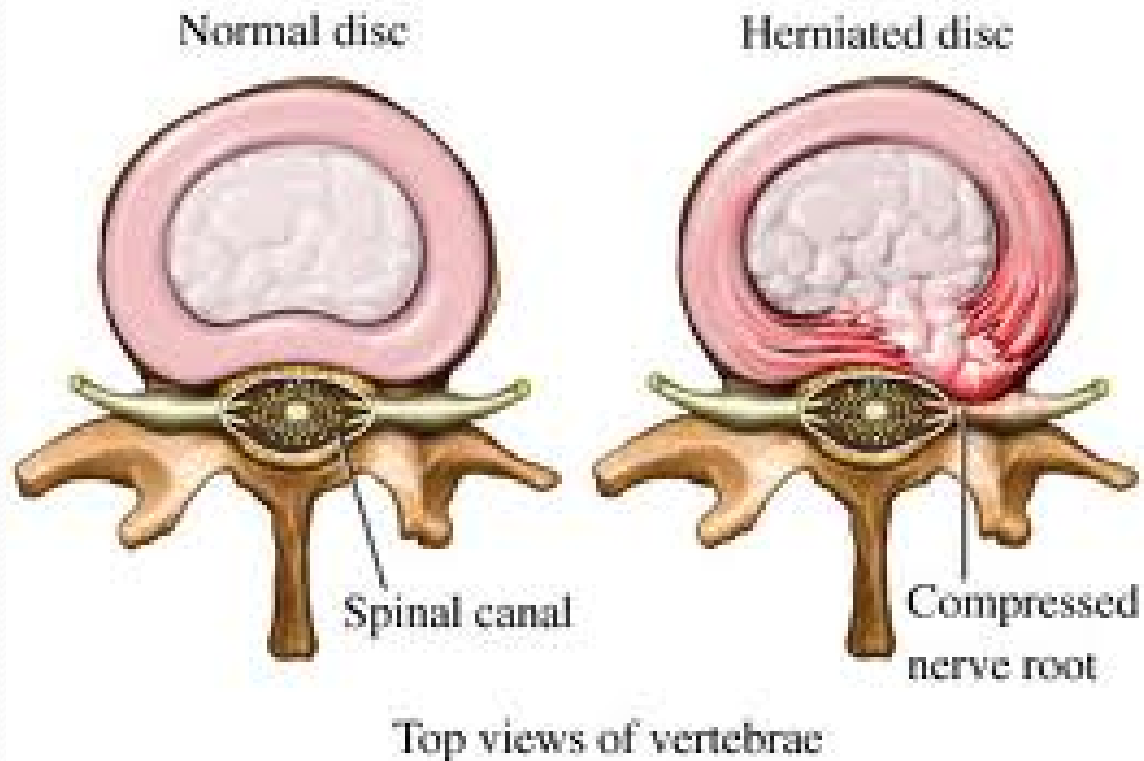
# Sciatica



- AKA Lumbar radiculopathy, nerve root irritation
  - Follows part or all of a dermatomal pattern
- Due to irritation or compression of nerve root in the lateral recess or foramen
  - Often caused by herniated disc, protrusion, bulge, stenosis

# Sciatica

- Intense inflammatory response
- Nerve root pain
- Acute phase ~3 weeks
- May turn chronic





# Sciatica

- Presentation:
  - Acute or chronic onset back and leg pain in dermatomal fashion
- Imaging:
  - MRI/CT/Myelogram – shows corresponding disc herniation near or deflecting nerve root
- Exam-
  - Check for neuro deficit, follow this over time
  - ? Straight leg test or Femoral stretch test



# Sciatica

- Treatment:
  - If no weakness or incontinence, consider meds, PT, epidural steroid injections
  - If function deteriorates or conservative measures don't work – surgical referral
- Surgical options:
  - Decompression of nerve root and discectomy

Table 5. Results of randomized trials of effectiveness of caudal epidural steroid injections in managing pain of lumbar disc herniation/radiculitis.

Study	Study Characteristics	Methodological Quality Scoring	Participants	Pain Relief			Results	
				3 mos.	6 mos.	12 mos.	Short-term relief ≤ 6 mos.	Long-term relief > 6 mos.
Manchikanti et al 2008 (247)*	RA, DB	72	84	81%	86%	79% to 81%	P	P
Dashfield et al 2005 (248)*	RA, DB	50	Caudal = 30 Endoscopy = 30	SI	SI	NA	P	NA
Bush and Hillier 1991 (238)	RA, DB	55	23	SI	NSI	NSI	P	N
Mathews et al 1987 (249)	RA, DB	62	C = 34 T = 23	SI	SI	SI	N	P
Hesla and Breivik 1979 (251)	RA, DB	58	69 patients: crossover design	77% vs 29%	59% vs 25%	59% vs 25%	P	P
Breivik et al 1976 (250)	RA, DB	68	C = 19 T = 16	20% vs 50%	20% vs 50%	NA	P	NA

\*Indicates use of fluoroscopy

RA = randomized; DB = double blind; C = control; T = treatment; NA = not available; SI = significant improvement; NSI = no significant improvement; vs = versus; P = positive; N = negative



# Level of Evidence

- Level I evidence for ESI to achieve short-term and long-term relief in patients with radicular pain
- Cost-effectiveness
  - 1 QALY = \$2927-6024 USD depending on study cited and technique (transforaminal vs caudal vs interlaminar)

# Failed Back Surgery Pain







# FBSS

- Presents:
  - Ongoing back and/or leg pain
  - Usually failed low dose opioids, PT, ESI
- Imaging:
  - MRI/myelogram - ? Any new impingement
  - EMG ? – any nerve damage
- Treatment
  - Epidural Steroid injection
  - Spinal Cord Stimulation highly effective in most cases

# Epidurals

Table 6. Results of randomized trials in managing low back pain of post-surgery syndrome with caudal epidural injections.

Study	Study Characteristics	Methodological Quality Scoring	Participants	Pain Relief			Results	
				3 mos.	6 mos.	12 mos.	Short-term relief ≤ 6 mos.	Long-term relief > 6 mos.
Manchikanti et al 2008 (252)*	RA, DB	70	40	65% to 70%	60%	60% to 65%	P	P
Revel et al 1996 (253)	RA	62	Forceful injection = 29 Regular = 31	NA	49% vs 19%	NA	P	P
Hesla and Breivik 1979 (251)	RA, DB	58	69 patients: crossover design	77% vs 29%	59% vs 25%	59% vs 25%	P	P

\*Indicates use of fluoroscopy

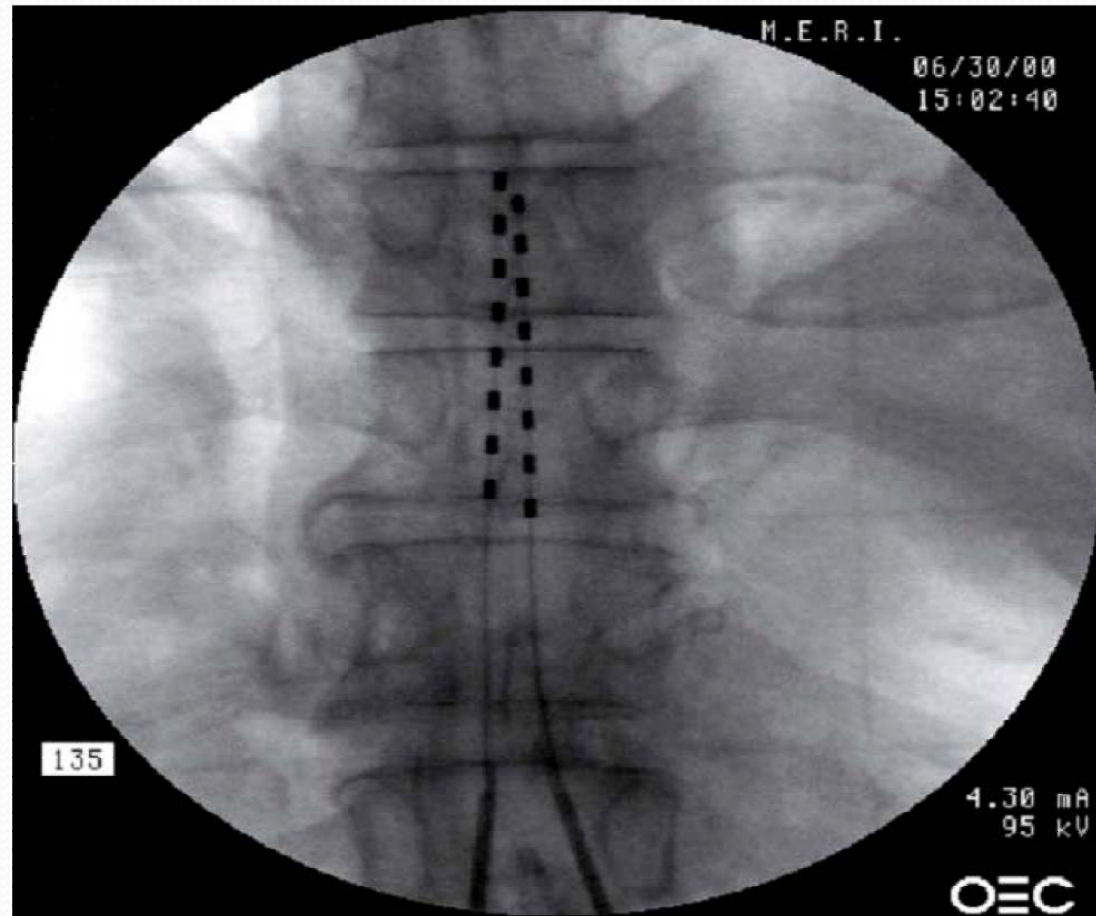
RA = randomized; DB = double blind; NA = not available; vs = versus; P = positive; N = negative



# Level of Evidence

- Level II-A or II-B for ESI for FBSS patients

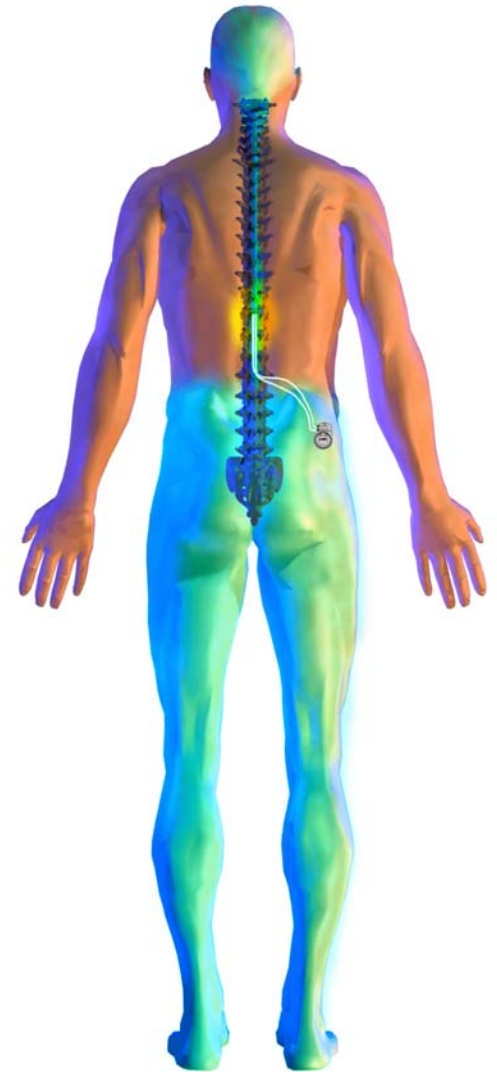
# Spinal Cord Stimulation



# Spinal Cord Stimulation (SCS)



*Implanted medical device that delivers electrical pulses to nerves in the dorsal aspect of the spinal cord that can interfere with the transmission of pain signals to the brain and replace them with a more pleasant sensation called paresthesia.*





# Indications

- Chronic pain of the trunk and extremities
- Failed Back Surgery Syndrome
- Reflex Sympathetic Dystrophy/CRPS
- Neuropathic Pain
  - Radiculopathy
  - Peripheral neuropathy
  - Ischemic Pain



# Steps

- Psychological Clearance
- Trial
  - Temporary placement of wires through needle into epidural space to cover painful areas
  - Success = >50% relief of pain, increased function
- Permanent Implant
  - Done by pain management or spine surgeon
  - Evidence suggests strong potential for long-term pain relief, lower doses of pain medications, less cost, increased function



# Level of Evidence

- Level II-A or II-B for FBSS and neuropathic pain
- **Cost-effectiveness data**
  - Several very high quality studies support this point
  - SCS use in FBSS vs medical management
    - Over 5 years \$29123 USD (SCS) vs \$38023 USD (control)
  - Comparing SCS vs reoperation surgery
    - \$31530 USD (SCS) vs \$38130 USD (reoperation) over 3 years
- **Strong evidence supports use of SCS in FBSS and neuropathic pain**





# What about MMI?

- Once a condition is diagnosed and work-up is complete, we should know how soon to expect MMI (roughly)
  - **Most conditions have a fairly routine treatment plan**
  - **Most spine problems can be sorted into surgical and non-surgical in first 2 months**
  - **If not surgical candidate, determine treatment plan, confirm response to treatment, make determination of MMI, impairment, work restrictions**
  - **Clarify ongoing medical needs**



# What about MMI?

- **Very typical presentation**
  - **If patient responds to meds, PT and first 1-2 injections – then likely they are close to MMI.**
    - **No need to wait 6-12 months (or longer)**
  - **If not responding- consider surgical eval vs implantable pain device if appropriate**



# What about MMI?

- **Ongoing medical needs:**
  - will likely include imaging, PT, injections and medications
- **Good treatment plan can expedite recovery and keep all parties on the same page**
  - Some cases are more complex

# When to refer to Pain Management

- Wonder if patient would benefit from a procedure or spinal cord stimulator
- Not better after spine surgery
- Patient has ongoing pain of spinal or nerve origin
- Patient needs work-up, treatment and ongoing management of pain
- **Acute back pain**
  - After trial of nsaid, rest, +/- steroid dose pack +/- PT
  - When patient gets their 1<sup>st</sup> refill for an opioid and have not seen improvement
  - If leg pain is present – consider ESI early
  - Recommend getting MRI if possible
    - Allows appropriate injection to be performed ASAP



# What can I expect in return

- Diagnosis, treatment plan, update on how patient is progressing
- Coordinate care as needed with PT, surgeon, ortho.
- Surgical referral if necessary
- Medication recommendations if nothing else to offer patient
  - Helps with long-term management
- Determination of MMI as soon as appropriate
  - Work restrictions (FCE), impairment, ongoing medical needs



# Case Scenarios

- 23 year old hispanic male with sudden onset back and right leg pain to calf with moving tires.
  - Primary care ordered rest, PT, oral medications
  - 2 weeks later- MRI Lumbar spine ordered
    - Mild right L4/5 protrusion (2-3mm) causing lateral recess stenosis
  - Spine surgeon eval
    - Recommended conservative care
  - Referral to Pain Management
    - Epidural steroid injections gave 70-80% relief for several weeks initially, then several months thereafter
    - Returned to work with medium work restrictions



# Case Scenarios

- 44 year old white male with flare of back pain that radiates to buttocks after fell off ladder, landed on buttocks
  - Xrays/MRI –mild degenerative changes
  - Tried PT – mild relief
  - Spine surgeon – Try to avoid fusion if possible
- Pain MD- exam suggested facet pain
  - Initial facet injection- > 50% relief 2 weeks
  - Proceeded to medial branch block and radiofrequency
    - 80 % relief of back pain 11 months
    - Returned to full duty



# Case Scenarios

- 35 yo female rear-ended while driving delivery van. Developed neck pain that radiated to back of head and shoulders 1-2 weeks afterwards.
  - Imaging normal
  - PT –”helps that day”
  - Headaches kept her out of work 1-2 days/week
- Pain MD
  - Exam showed facet tenderness over c2/3 3/4 facets with radiation to occipital region
  - Diagnostic cervical facet injection
    - Pain completely resolved for 2 months with first injection
    - Headaches resolved, able to return to work after 1<sup>st</sup> injection





# Case Scenarios

- 42 year old African American male with back and bilateral leg pain stemming from restraining suspect during traffic stop
  - MRI showed L5/s1 herniation with severe foraminal stenosis
  - No relief from meds, PT, ESI
  - Spine surgery- L5/s1 Posterior fusion with decompression
  - 3 months later- pain returned, imaging unchanged, no relief meds, PT, ESI. Not surgical
  - Spinal stimulator trial 80% relief of pain
    - Implant successful. Able to return to light duty full time



# Suggested Resources

- [www.carolinapain.com](http://www.carolinapain.com)
  - Videos of various injections
  - Patient handouts on pain conditions
- Painmed.org- AAPM website

Questions?



Thank you!

