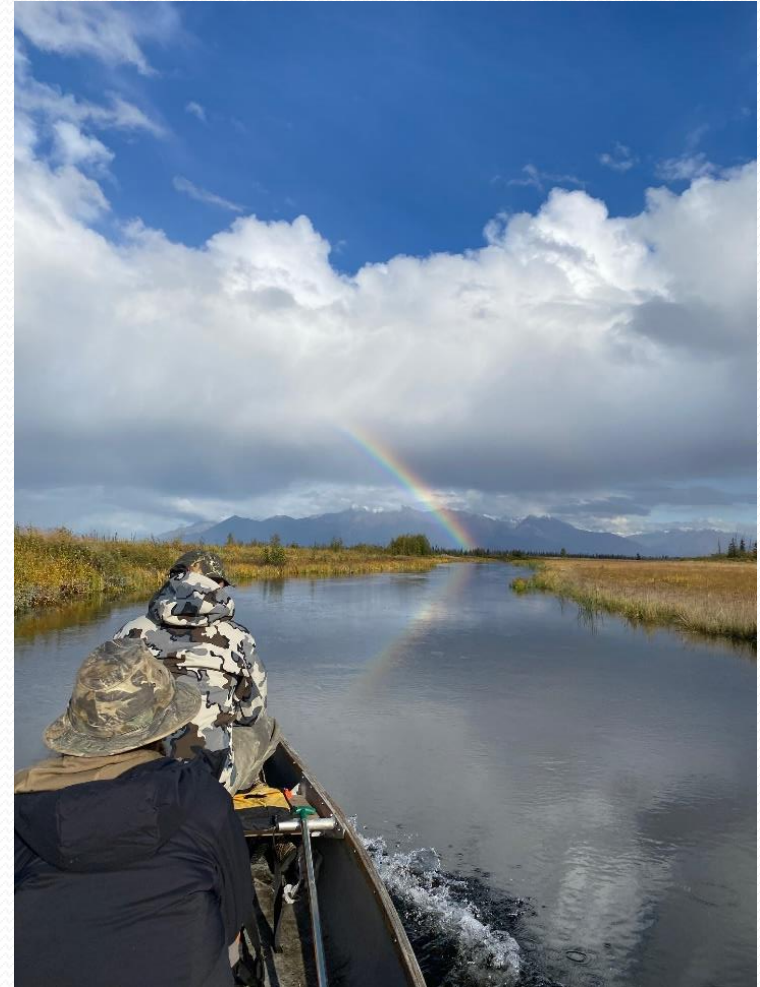


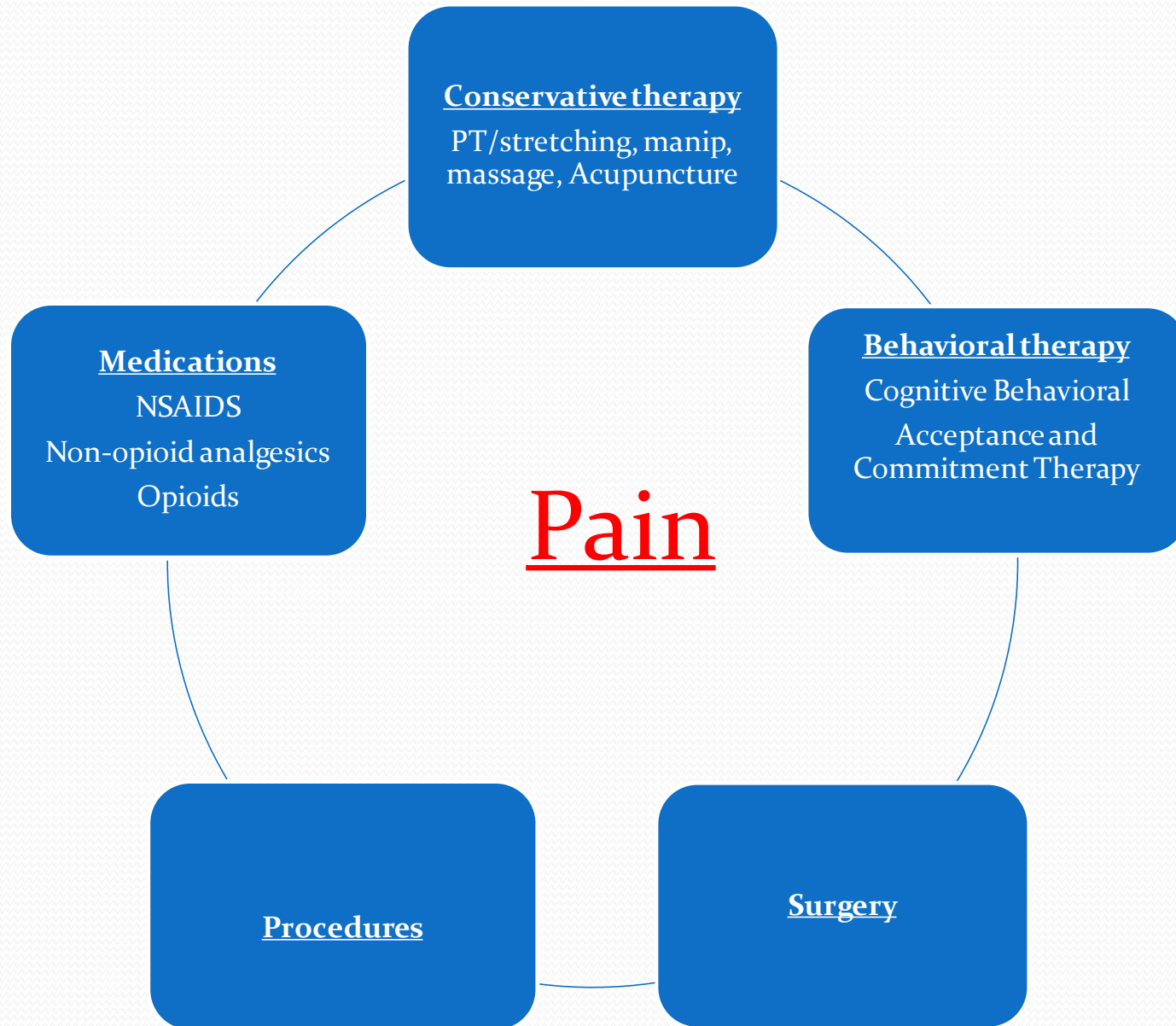
Interventional Pain Management

Phillip Weidner, DO, DABA, BCPM
Director Of Pain Management, ANTHC
October 30th, 2020

Objectives

- Identify how pain management referrals can fit into your practice
- Pain interventions
- Focused back exam
- How to make an appropriate referral to expedite appointments





Common Goals

- Decrease Pain
- Increase functionality
- Regain ADLs
- Decrease pain medications
 - Opioid tolerance and addiction
- Decrease the amount of unnecessary travel
- 12 family medicine practices
 - #1 low back pain-44⁰%
 - #2 arthralgia-33⁰%
 - #3 headache 28⁰%
- Opioid prescribing assoc with increased disability at 6 months

Role of the CPMC

- Comprehensive Pain Management Center (CPMC)
 - Address the entire patient
 - Surgical and procedural history
 - Physical, behavioral and environmental forces contributing to a patients perception of pain
 - Multidisciplinary approach
 - Medication suggestions
 - Diagnostics for neurosurgical planning
 - Interventional therapy

What is the Comprehensive Pain Management Center?

- First patient October 2013
- Thousands of patients seen since inception
- >8K procedures performed
- Adapting as our needs are changing
- Mainly interventional



Who is the CPMC?

- Providers
 - Phillip Weidner, DO
 - Abigail Granath, PA
 - Diane Mitchel, NP (Inpatient)
- Director of Specialty Clinics
 - Jason Hart, MBA, MHA
- Nursing support
 - Annie Thompson, RN
 - Patients with last names L-Z
 - 907-729-2501, athompson@anthc.org
 - Jessica Musgrove, RN
 - Patients with last names A-K
 - 907-729-2523, jausgrove@anthc.org

Phillip Weidner

- Born and raised in Anchorage, Alaska
- BA in neuroscience, Colorado College
- Neuroscience research, UCSB
- University of New England
 - Doctor of Osteopathy, ΣΣΦ, ΨΣΑ
- Oregon Health and Sciences University
 - Board Certified in Anesthesiology
- Oregon Health and Sciences University
 - Board Certified in Pain Management
 - Returned to Anchorage in 2013 like a salmon



- Lifelong outdoorsman
 - Travelled from Canadian border to Kiana by foot/raft
- Backpacked throughout Alaska
- Alaska is my home
- Respect for Alaska Native culture

Abigail Granath, PA

- Undergraduate Studies at Michigan State University
BS in Human Biology
- Masters of Physician Assistant Studies at AT Still University in Mesa Arizona
- Started in 2017
- Previous experience in Neurosurgery and Pain Management



Diane Mitchel, NP

- In patient provider working at ANMC
- Worked in Fairbanks for years with ICU experience
- Moved to ANMC in 2016
- Daily rounds on pain patients



Low back pain

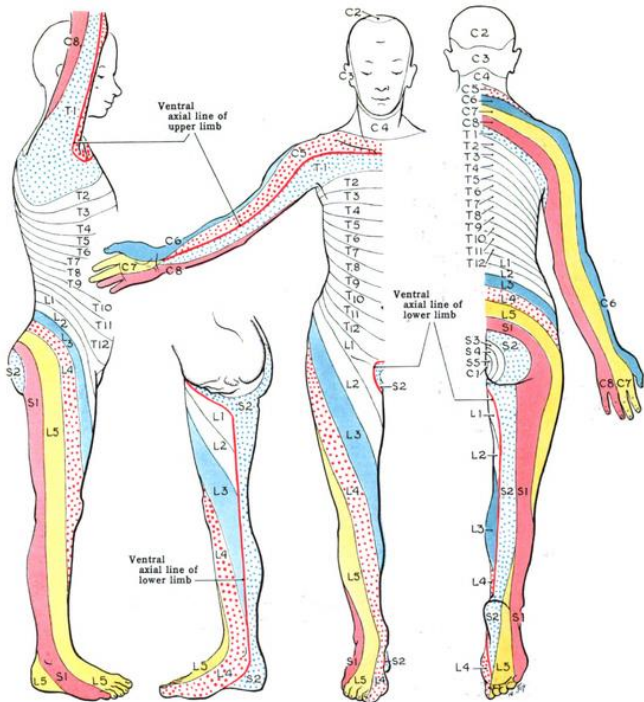
- DDx

- Myofascial pain
- Stenosis
 - Foraminal, central
- Facet arthropathy
- SI joint pain
- Discogenic pain
- Mass expanding lesion
- Failed back syndrome



Radicular verses Axial LBP

- Radicular
 - Radiates into extremity along dermatome
- Axial
 - Remains fairly isolated to back with limited radiation



Radicular back pain

- Lumbosacral radiculopathy: objective sensory/motor loss (diagnosed EMG/NCV)
- Lumbosacral radicular pain: radiating pain which travelling to below the knee.
 - Lifetime prevalence as high as 43%¹
 - Risk factors: male, obesity, smoking, history back pain, anxiety, depression, laborer, **heavy lifting, exposure to vibration at work.**²

¹ Konstantinou S, Sciatica: review of epidemiological studies and prevalence estimates. *Spine.* 2008; 33:95-103.

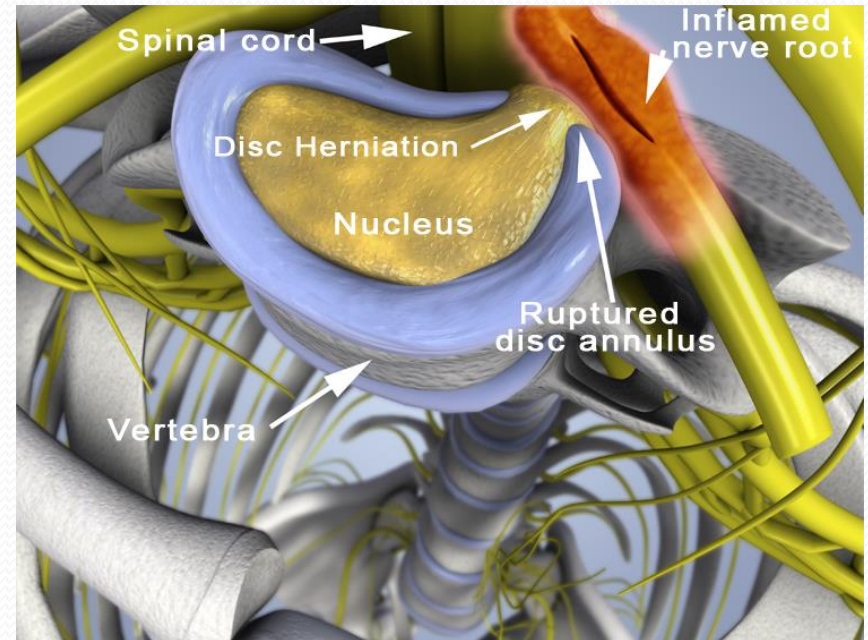
² Younes et al. Prevalence and risk factors of disc related sciatica. *Joint Bone Spine.* 2006; 73: 538-542.

HEAVY LIFTING



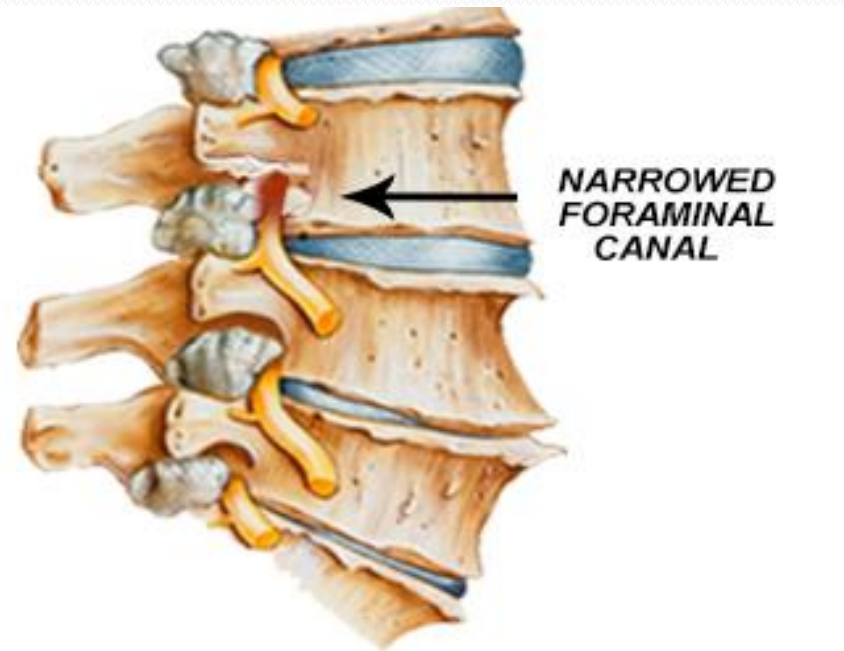
Radicular pain

- Patient History
 - Sharp, dull, piercing, throbbing or burning pain
 - Often associated with paresthesia in a given dermatome
- Herniated disc: most common cause LSR <50 yrs
 - Classic: increases by bending forward, sitting, coughing
 - Made better by laying down, walking



Radicular pain (cont)

- Lumbar stenosis: >50 yrs, degenerative changes most common
 - Increased by walking uphill
 - Typically improves immediately when walking stopped, bend forward



Physical Exam

- Neurological exam
 - Sharp touch
 - Strength
 - Vibration
- Tenderness at level of compression
- Straight leg raise is usually positive



Radicular Pain Treatment

- Surgery? Injections?
 - Patient and geographic factors
 - Middle 2/3's of patients are in grey zone
 - Temporized with medications-neuropathic agents, analgesics
- Interventional therapy
 - Intralaminar
 - Transforaminal
- Both introduce steroid into the epidural space
- Premise is that these injections decrease inflammation and inflammatory mediators

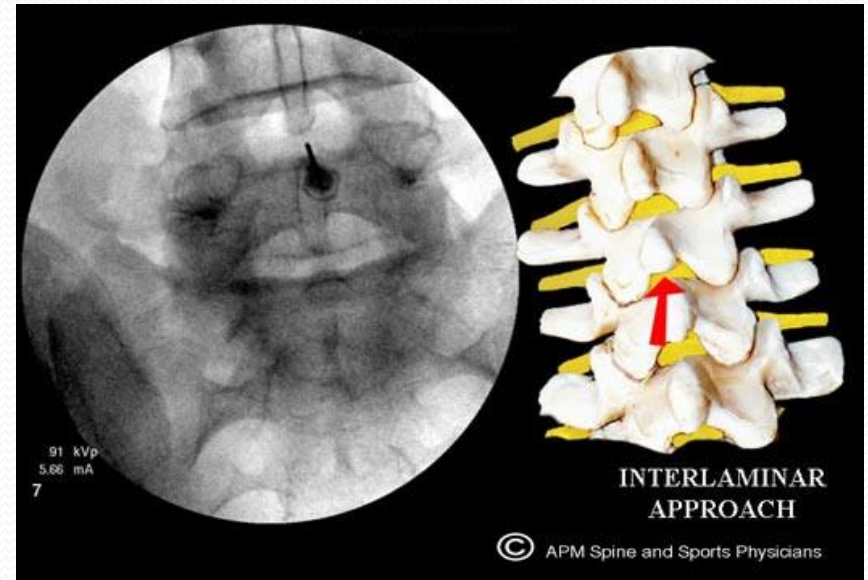
Patients likely to benefit

- Depends on what trials you look at
- American Pain Society Low Back Pain Guideline, 2009
 - Recommend ESI's for radicular pain, insufficient evidence to evaluate benefits/harm for spinal stenosis
- 1B level evidence¹ (strong recommendation, moderate quality evidence)
- Best evidence in
 - Acute lumbar disc herniation with radiculopathy
 - Low back pain with radicular symptoms

¹Rathmell, J. Atlas of Image Guided Intervention in Regional Anesthesia and Pain Medicine. 2012.

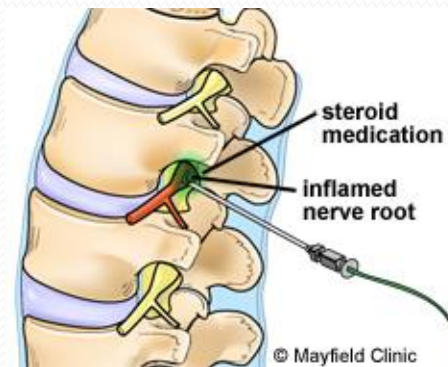
Intralaminar ESI

- Similar to epidural placement for child bearing
- Predominate procedure for low back pain in the past
- Historically done “blind,” now done with fluoroscopy to ensure placement and safety.



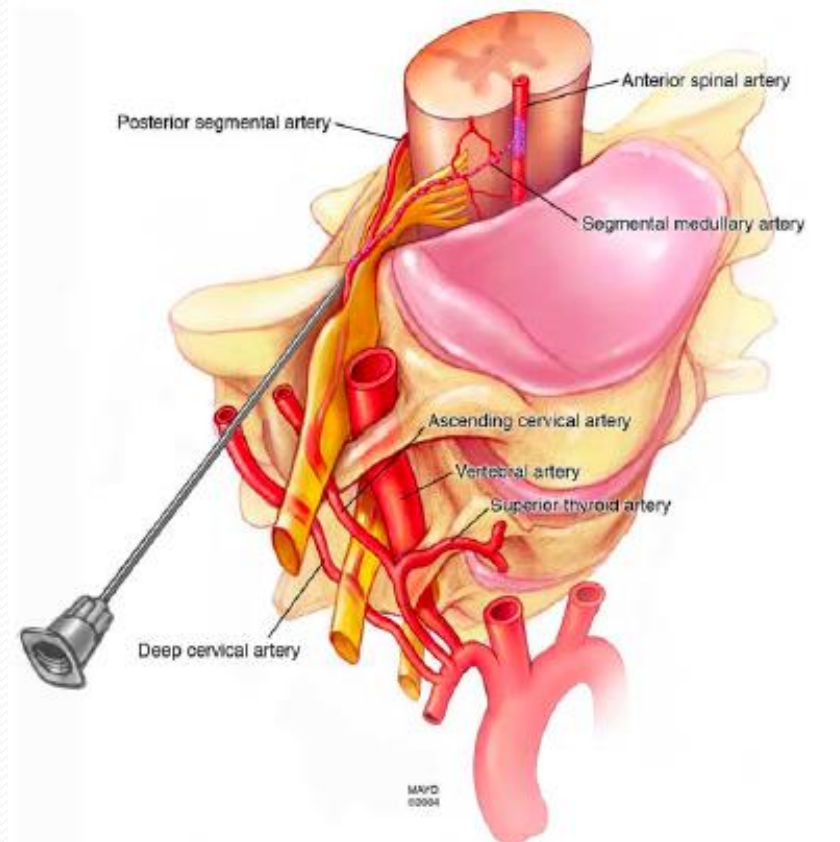
Transforaminal ESI

- Placement of steroid/local anesthetic at the neuroforamen (nerve root) within the sheath
- Usually used for unilateral pain
- Puts the medication in the area of concern-the least likely to get it otherwise
- Imaging always used
- Requires training and specific anatomical knowledge



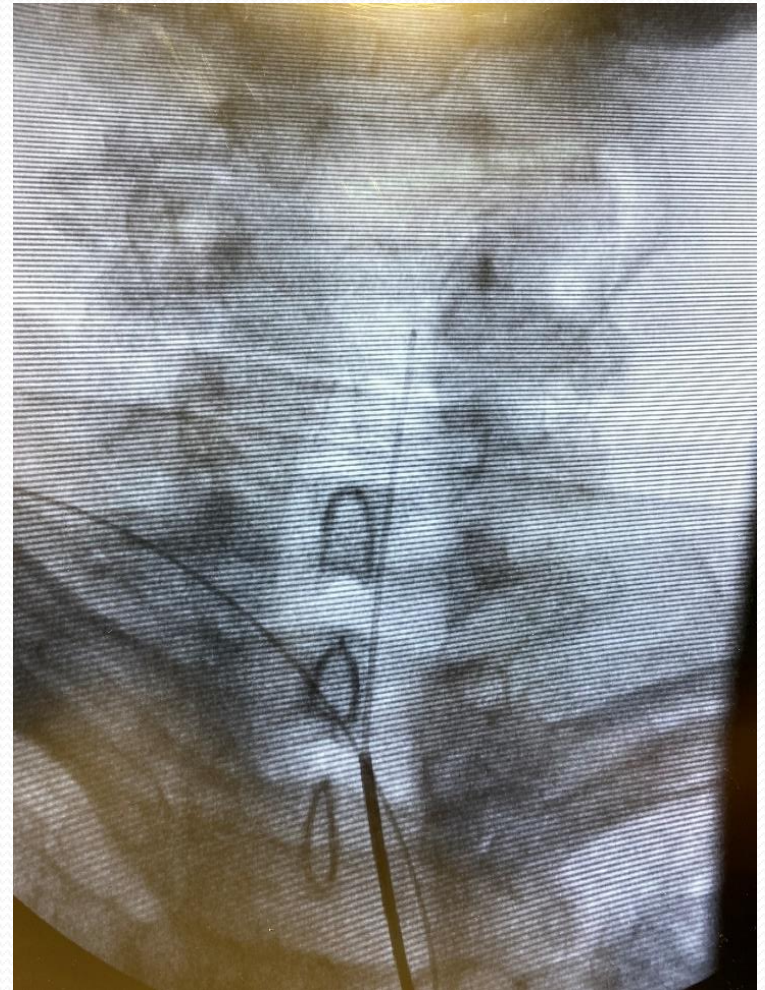
Cervical ESI's

- Similar processes occur in the neck as the lumbo-sacral area
- Catastrophic complications can occur from injecting the vertebral artery or the posterior segmental artery



Cervical ESI's (cont)

- Intralaminar injections can be done safely with a catheter fed up to the level of interest



Chronic axial low back pain

- Non radicular pain
- Cause can usually be delineated by physical exam
- Most commonly
 - myofascial
 - facet arthropathy
 - SI arthropathy



68 year old female with chronic back pain

Referral for lumbago

-started after a fall 5 months ago

Other Specialists

-Primary care
-mechanical low back pain

Medications

non contributory

PMHx

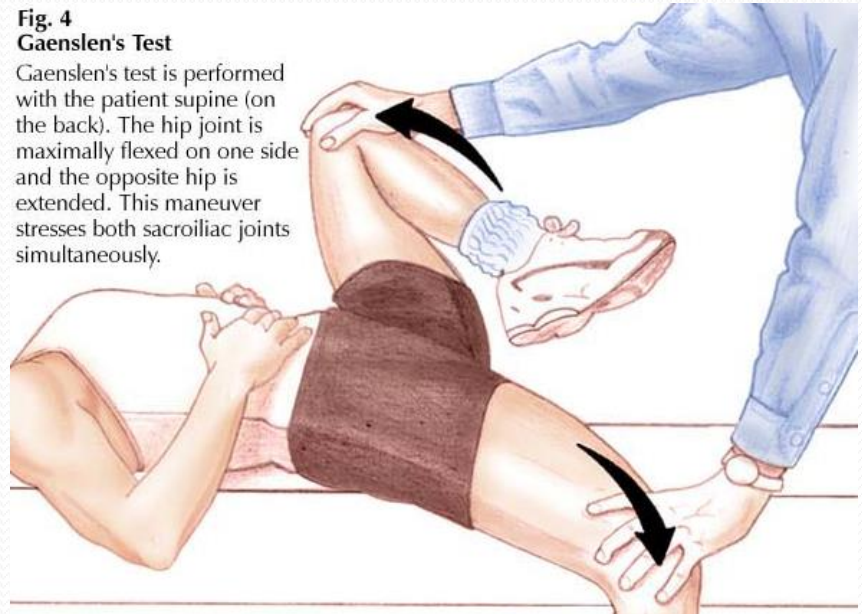
osteopenia, depression, back ache, GERD, IBS, knee pain, fibromyalgia

Description of pain

- Right buttock, hip, and thigh, diffuse
- Originally started 20 years ago without an incident, intermittent since that time
- Wearing a heel lift on the right side helped for almost 20 years
- Description: “zingy,” radiation to the upper thigh, made worse by bending forward, climbing stairs, exercise, getting out of chair, lying on her right side

Pertinent Physical exam

- Lumbar spine
 - Not provocative
- Patricks: Positive on the right
- Gaenslen's: Positive on the right
- TTP at right buttock
- Intact sensory exam



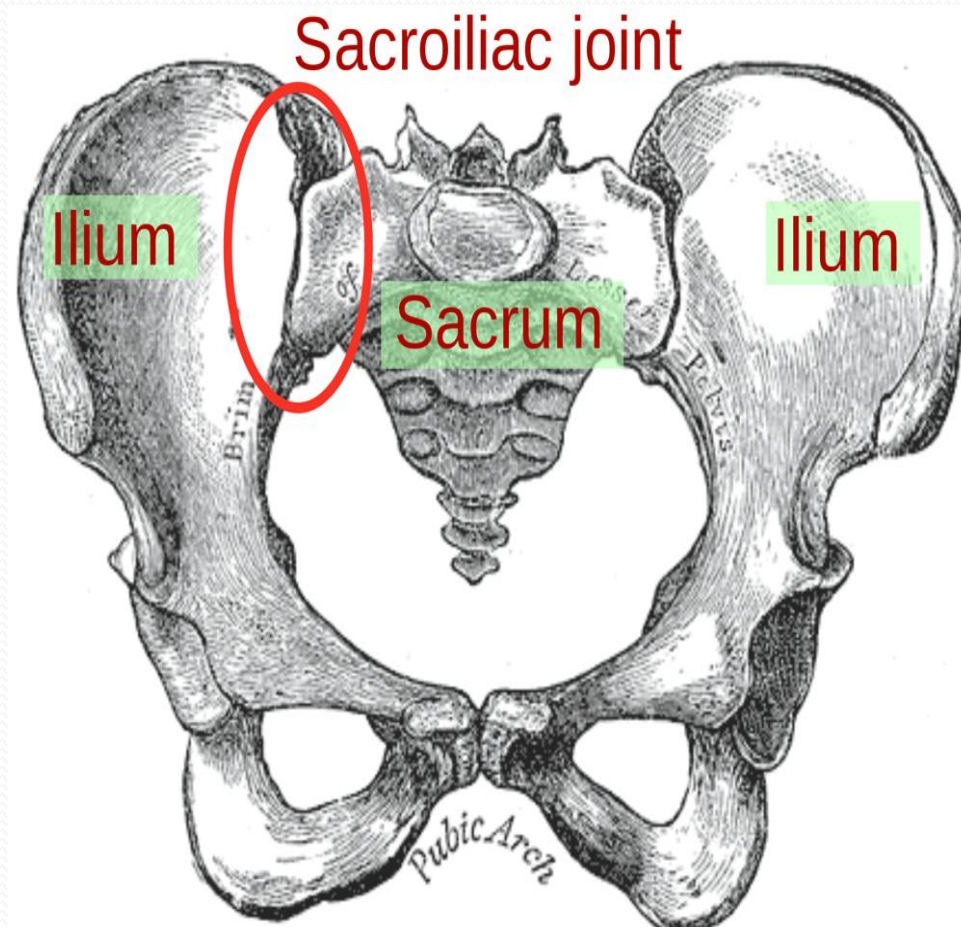
Radiology



What are you thinking so far?

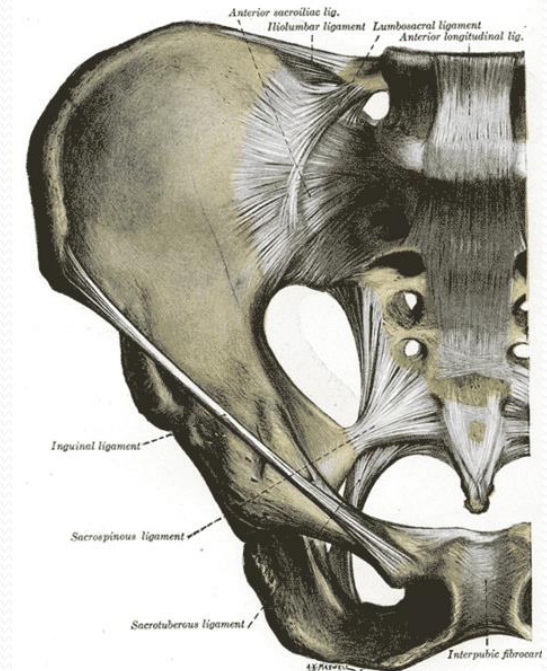
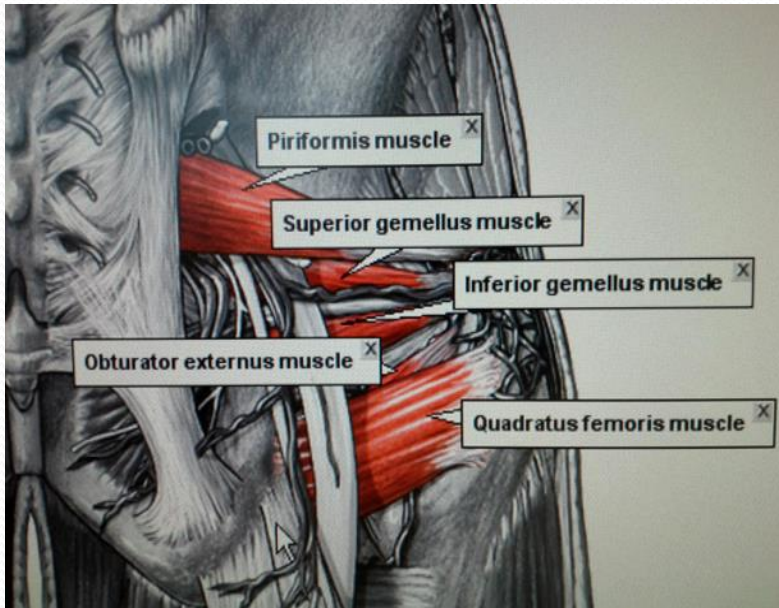


SI joint Anatomy and Function



Characteristics

- L shaped joint which have little movement (2-18 degrees)
- Muscles
 - Piriformis, gluteus maximus, gemelli, biceps femoris



Ligaments

- compose the dorsal aspect of the joint as the joint capsule is incomplete.
- anterior sacroiliac, iliolumbar, inguinal, sacrospinous, sacrotuberous

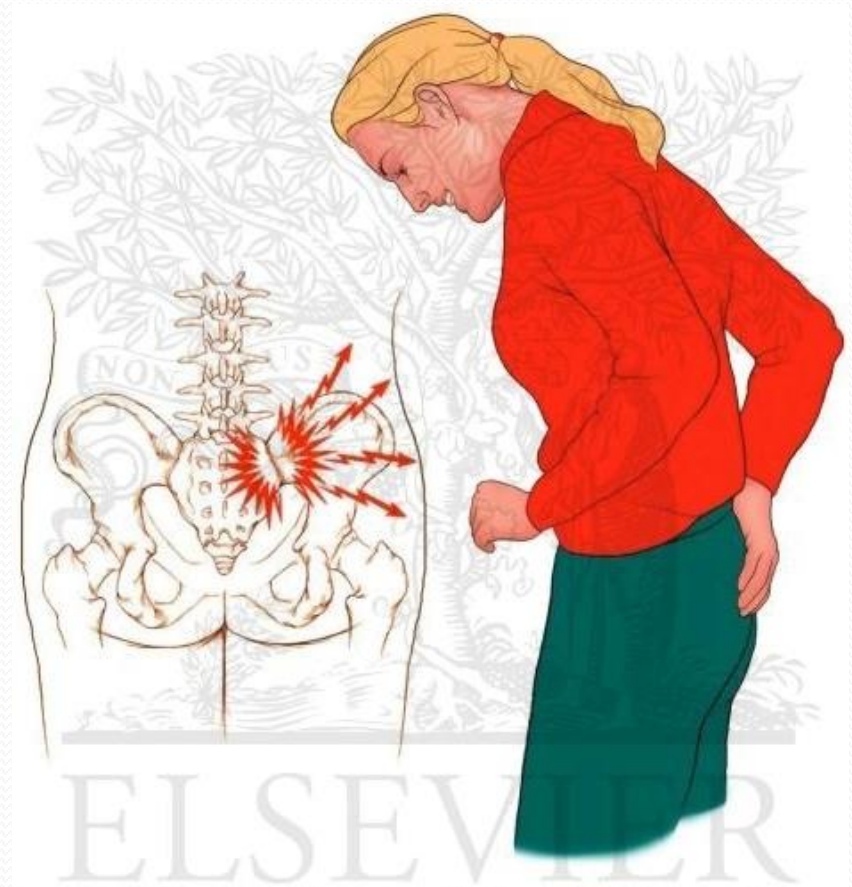
Prevalence of SI joint dysfunction

- Debatable issue
 - Largest study was a retrospective study by Bernard and Kirkaldy-Willis, 1293 patients who found the prevalence to be 22.5% in patients presenting with low back pain


Bernard Kirkaldy-Willis, Recognizing specific characteristics of nonspecific low back pain. Clin Orthop 1987;217:266-280.

Referral patterns of the SI joint

- Unilateral pain presenting on the PSIS
- Pain/stiffness when sitting or standing for long periods of time



Sacroiliac joint pain referral zones

Curtis W. Slipman, MD ^a, Howard B. Jackson, MD^a, Jason S. Lipetz, MD^a, Kwai T. Chan, MD^a, David Lenrow, MD^a, Edward H. Vresilovic, MD, PhD^b

^a Department of Rehabilitation Medicine, Hospital of the University of Pennsylvania, Philadelphia, PA, USA

^b Department of Orthopaedic Surgery, Hospital of the University of Pennsylvania, Philadelphia, PA, USA

Table 1: Frequency of Pain Referral to the Lumbar, Buttock, Groin, and Abdominal Regions

Anatomic Region	Percentage of Patients With Pain
Upper lumbar	6
Lower lumbar	72
Buttock	94
Groin	14
Abdomen	2

Table 2: Frequency of Pain Referral to the Lower Extremity

Anatomic Region	Percentage of Patients With Pain
Thigh	48
Posterior	30
Lateral	20
Anterior	10
Medial	0
Lower leg	26
Posterior	18
Lateral	12
Anterior	10
Medial	0
Ankle	14
Foot	12
Lateral	8
Plantar	4
Dorsal	4
Medial	0

SI joint dysfunction patient characteristics

- Risk factors
 - True leg length discrepancy
 - Gait abnormalities
 - Scoliosis
 - Spinal Fusion
 - Pregnancy
 - Trauma
 - Most common is MVA second is fall onto buttocks, third is childbrith
 - Pathological states
 - HLA-B27 spondylarthropathies

A Multitest Regimen of Pain Provocation Tests as an Aid to Reduce Unnecessary Minimally Invasive Sacroiliac Joint Procedures

Peter van der Wurff, PT, PhD, Evert J. Buijs, MD, Gerbrand J. Groen, MD, PhD

Objective: To compare the diagnostic accuracy of a multi-test regimen of 5 sacroiliac joint (SIJ) pain provocation tests with fluoroscopically controlled double SIJ blocks using a short- and long-acting local anesthetic in order to reduce the exposure of patients to unnecessary invasive SIJ procedures.

Design: Prospective, observational study.

Setting: Hospital setting.

Participants: Sixty patients with chronic low back pain.

Interventions: Not applicable.

Main Outcome Measures: Visual analog scale score and receiver operating characteristic (ROC) curve.

Results: Twenty-seven patients responded positively to the blocks, of whom 23 were found positive after the multitest regimen and 4 were negative. For the nonresponders (n=33), these figures were 7 positive and 26 negative. The calculated sensitivity and specificity were .85 (95% confidence interval [CI], .72-.99) and .79 (95% CI, .65-.93), respectively. Positive and negative predictive values were .77 (95% CI, .62-.92) and .87 (95% CI, .74-.99), respectively. The positive likelihood ratio was 4.02 (95% CI, 2.04-7.89); the negative likelihood ratio was .19 (95% CI, .07-.47). The area under the ROC curve was .799.

Conclusions: The test regimen with 3 or more positive tests is indicative of SIJ pain. It can be used in early clinical decision making to reduce the number of unnecessary minimally invasive diagnostic SIJ procedures.

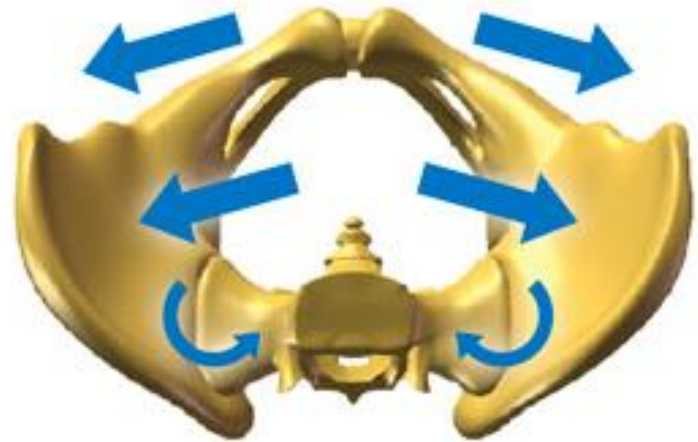
Key Words: Intra-articular injections; Pain assessment; Rehabilitation; Sacroiliac joint.

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- Exams used
 - Distraction
 - Compression
 - Thigh Thrust
 - Patricks
 - Gaenslens

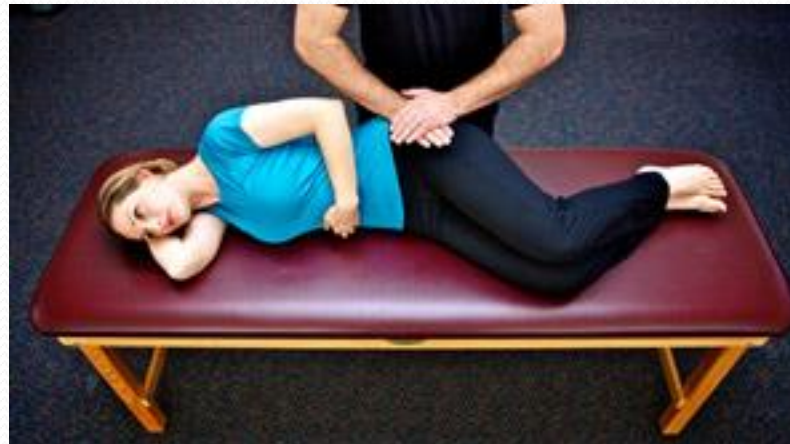
Distraction test

The patient is supine and the examiner applies pressure to the bilateral ASIS with lateral force to “distract” the joint.



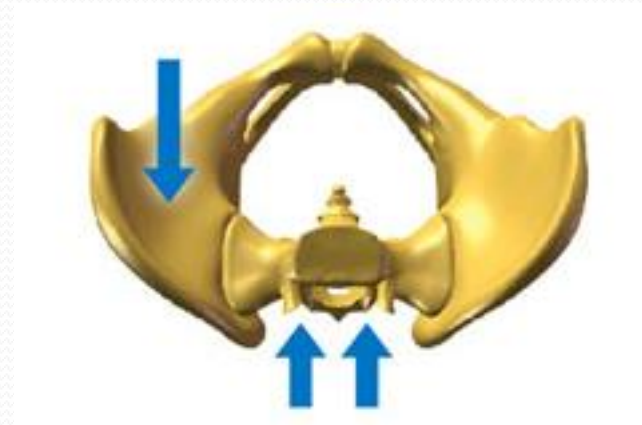
Compression test

- Patient is lying on their side. The tester is behind the patient applying a downward pressure through the anterior portion of the ilium



Thigh Thrust test

- Patient is supine and hip is flexed 90 degrees with the knee bent. The tester applies a shearing force to the SIJ through the femur. Avoid excessive adduction.



Patrick sign (FABER)

- Flexion, Abduction and External Rotation
- Can be used for either intraarticular hip pathology or SI joint dysfunction

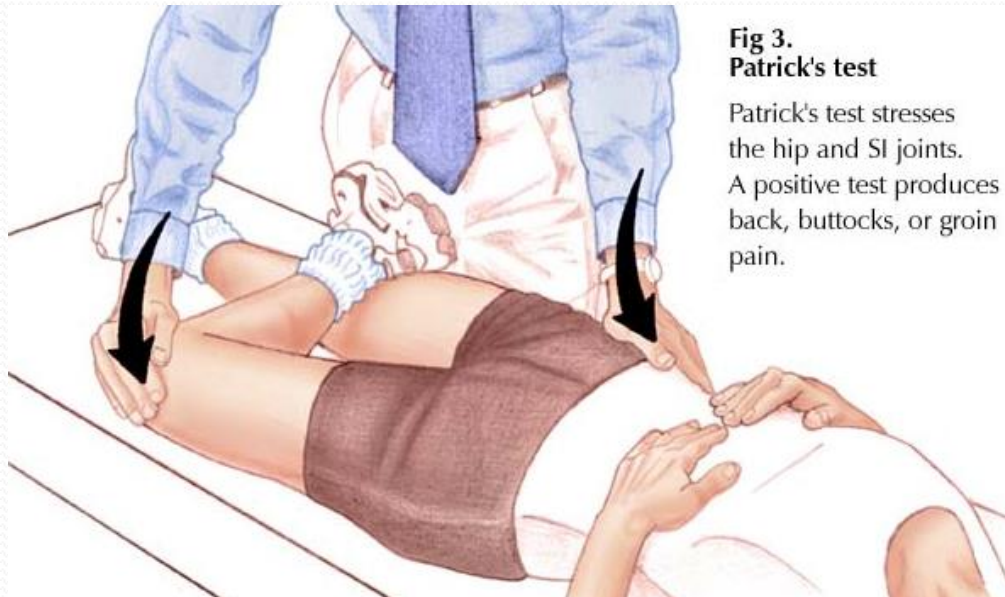
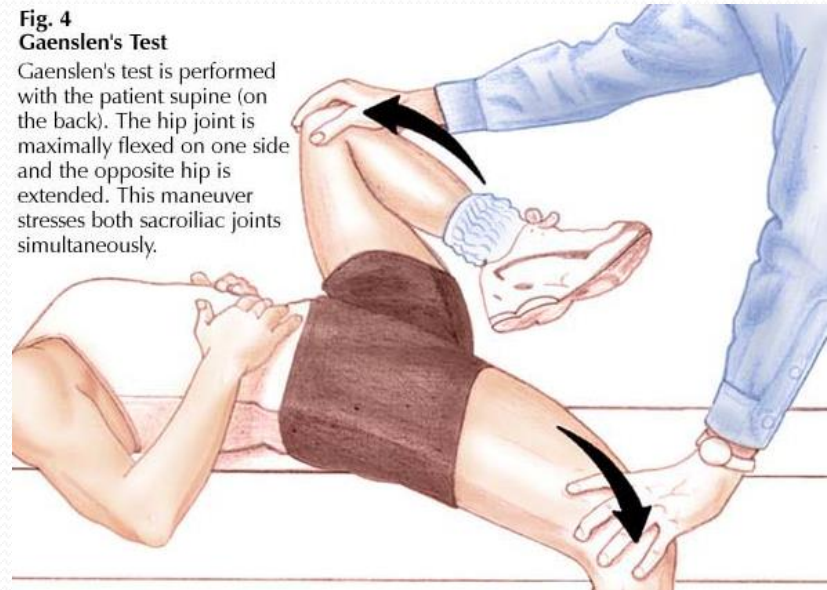


Fig 3.
Patrick's test

Patrick's test stresses the hip and SI joints. A positive test produces back, buttocks, or groin pain.

Gaenslen's Test

- The patient is supine lying near the side of table. The examiner stands on side of patient and places leg closest to them off edge of table. The examiner then instructs the patients to actively flex the opposite leg to their chest and hold. The examiner then applies pressure to the leg hanging off edge of table forcing the hip into extension.



Peter Van der Wurff et al

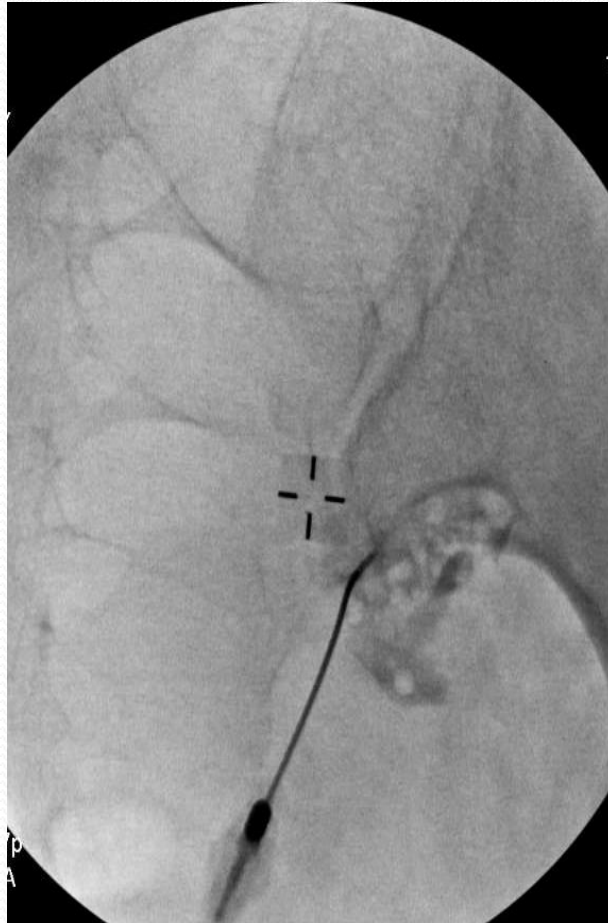
- Combination of >3 of the five tests listed led to a positive result (>50% relief) with diagnostic blocks with 85% sensitivity and 79% specificity.

Table 3: Threshold of 3 Positive Tests (N=60)

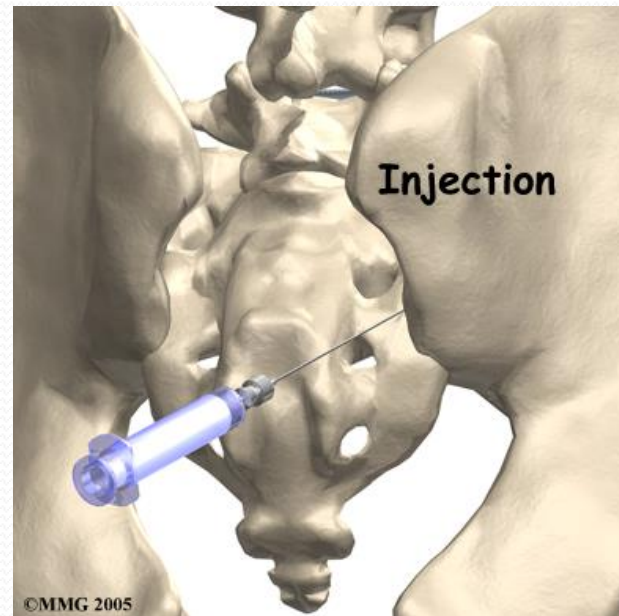
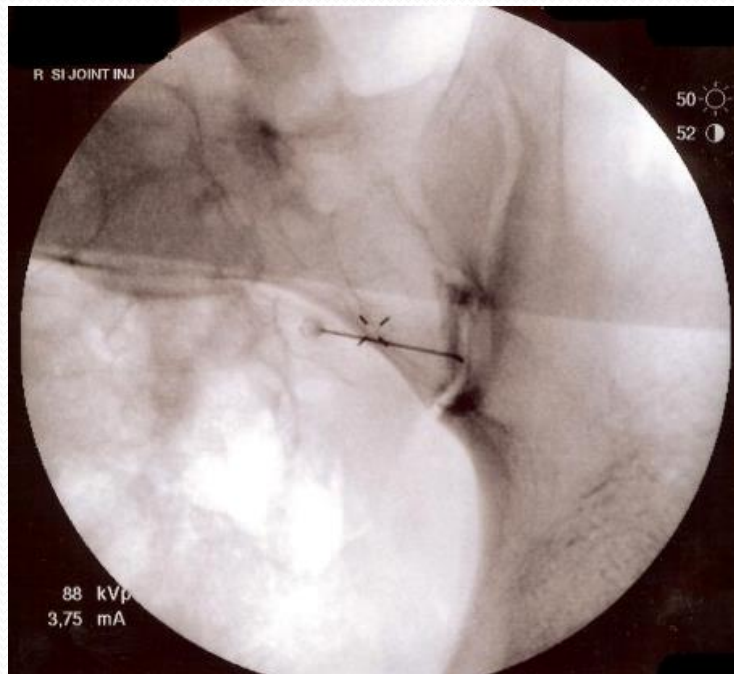
Responders	Reference Test		Total
	Positive Result Injection	Negative Result Injection	
Positive (≥ 3 SIJ tests)	23	7	30
Negative (≤ 2 SIJ tests)	4	26	30
Total	27	33	60

Test Feature	Value	95% CI
Sensitivity	0.85	0.72–0.99
Specificity	0.79	0.65–0.93
Positive predictive value	0.77	0.62–0.92
Negative predictive value	0.87	0.74–0.99
Likelihood ratio positive	4.02	2.04–7.89
Likelihood ratio negative	0.19	0.07–0.47
False positive proportion	0.21	0.07–0.35
False negative proportion	0.15	0.01–0.28
Overall accuracy	0.81	0.71–0.91

Interventions for SI dysfunction

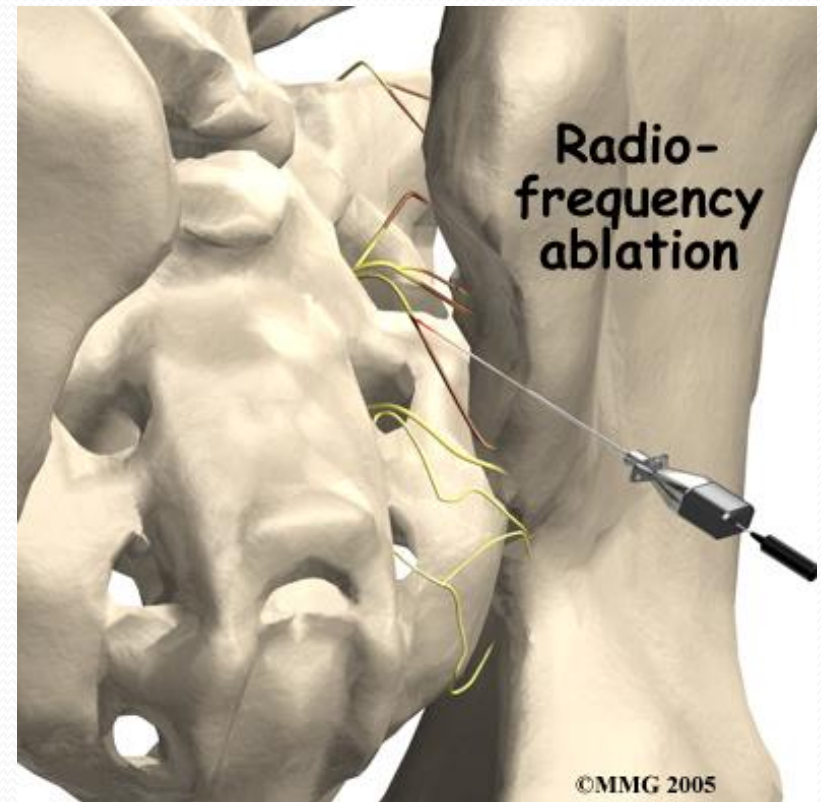


Peri/Intra-articular injections



RF Ablation

- Efficacy has been illustrated by several prospective observational and retrospective studies as well as a randomized placebo controlled trial.
- Differences in the RF parameters and targets has varied greatly.



Significant publications regarding RF ablations

- Dreyfuss 2009¹
 - Pulsed RF at the L4, L5 rami mediales and the S1, S2 rami laterales
 - >50% pain relief obtained in 73% of patients with clinical duration of 6-32 weeks

¹Dreyfuss, The ability of multi-site, multi-depth sacral lateral branch blocks to anesthetize the SI joint complex *Pain Medicine* 2009 10(4) 679-688.

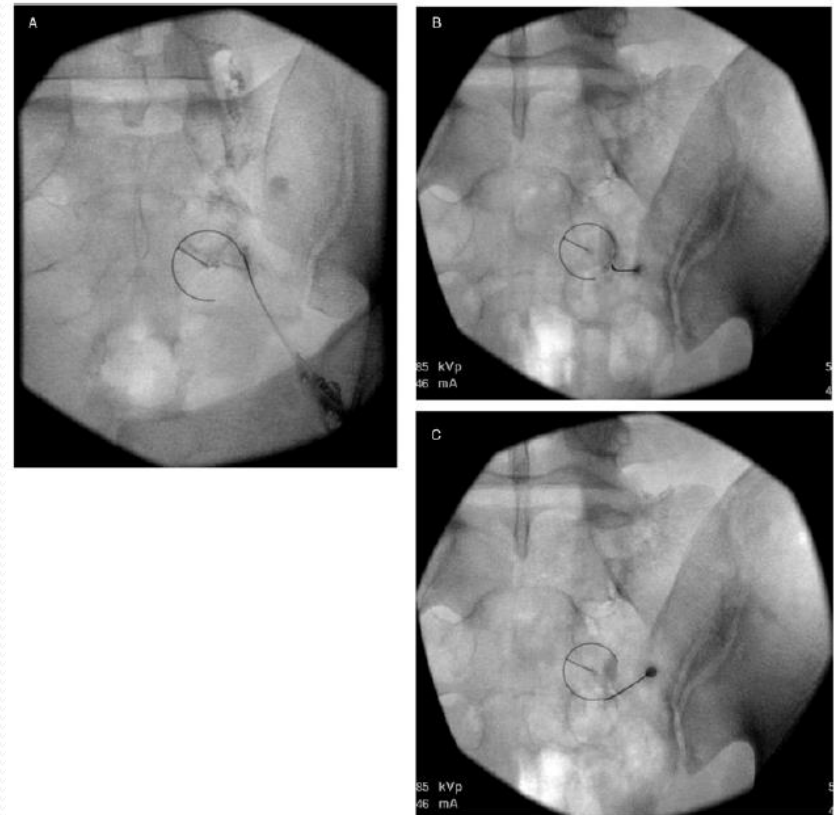
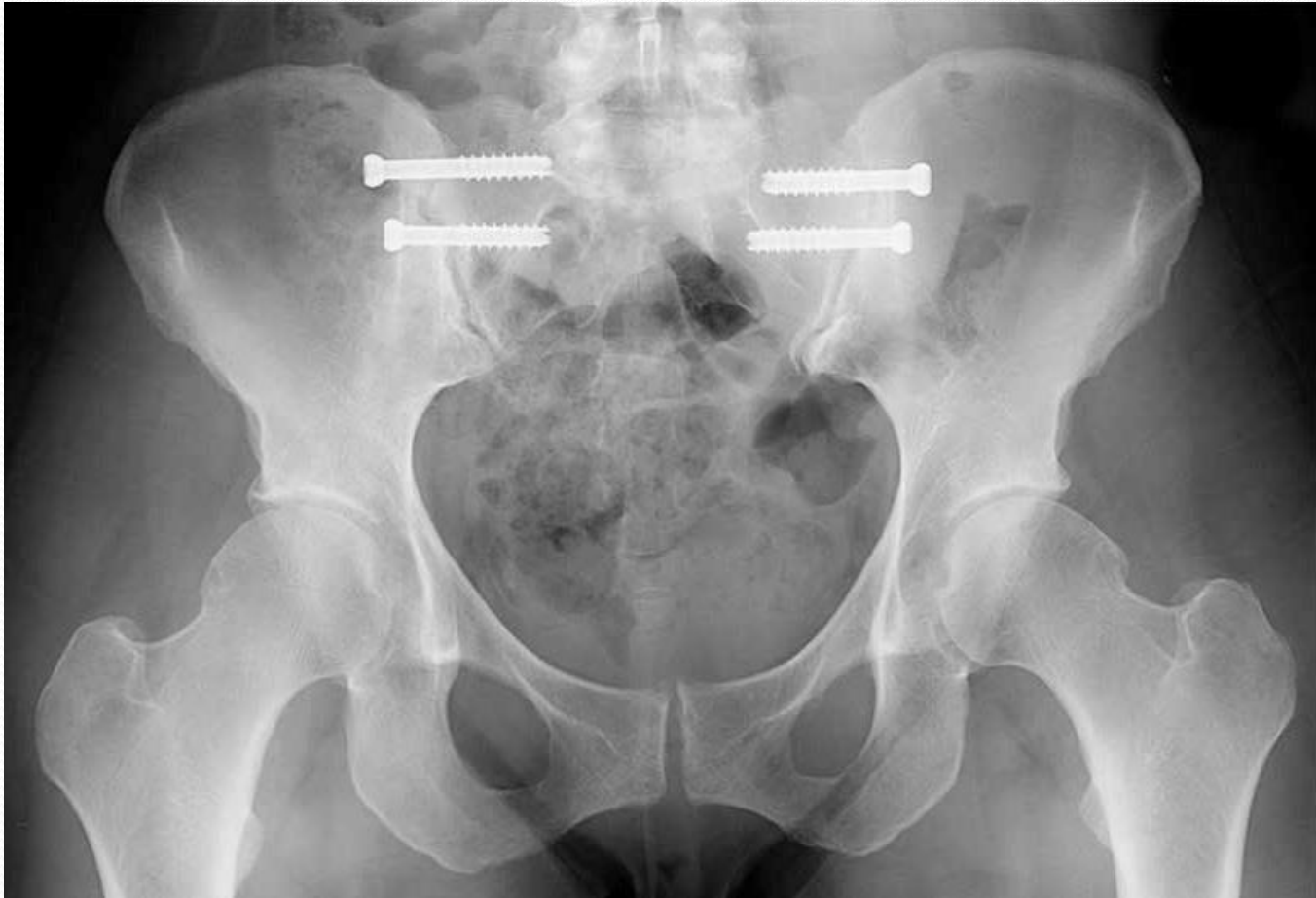


Figure 8 Postero-anterior fluoroscopy views of injections of contrast medium from needles placed at various positions for S2 lateral branch blocks. (A) 2:30 position. (B) 4:00 position. (C) 5:30 position.

SI Joint Fusion

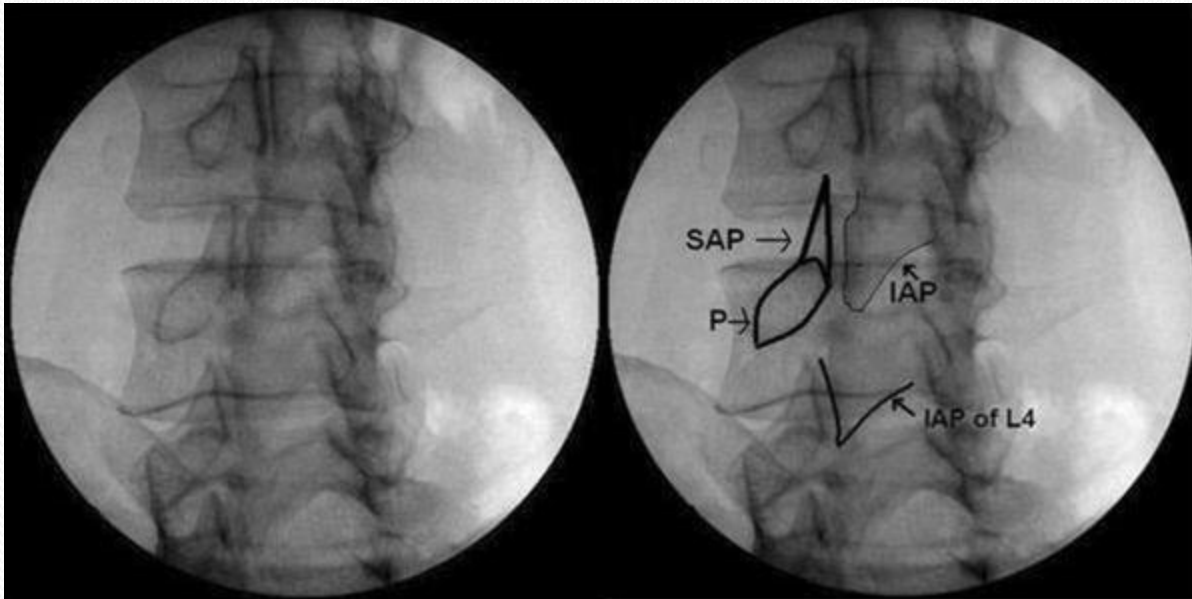
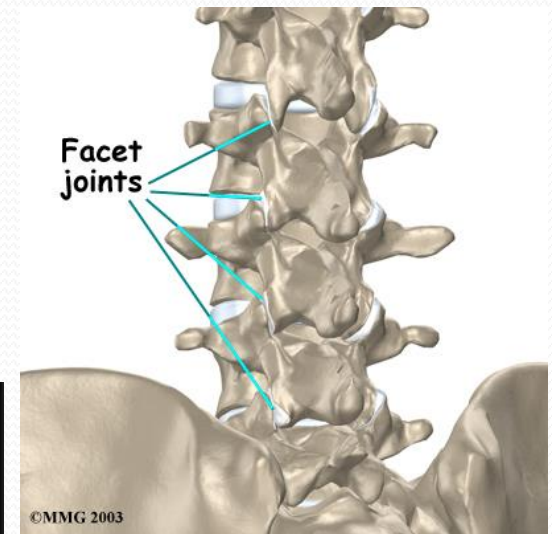


Lumbar Facet Syndrome



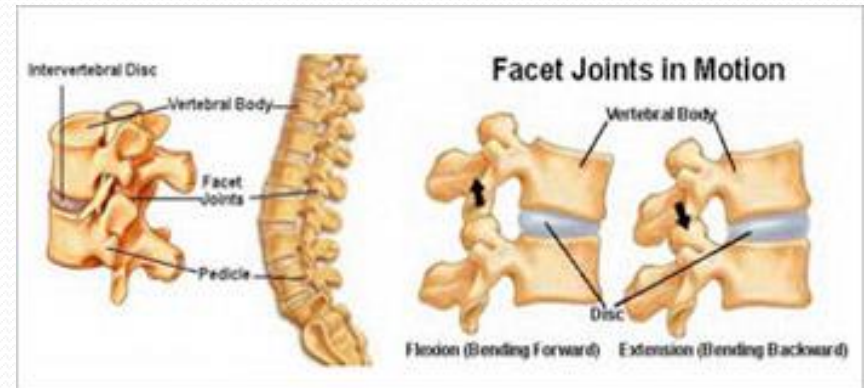
Lumbar Facet joints

- Also called zygapophyseal joints
- True synovial joints with a joint space and hyaline cartilage



Movement of the Facet Joints

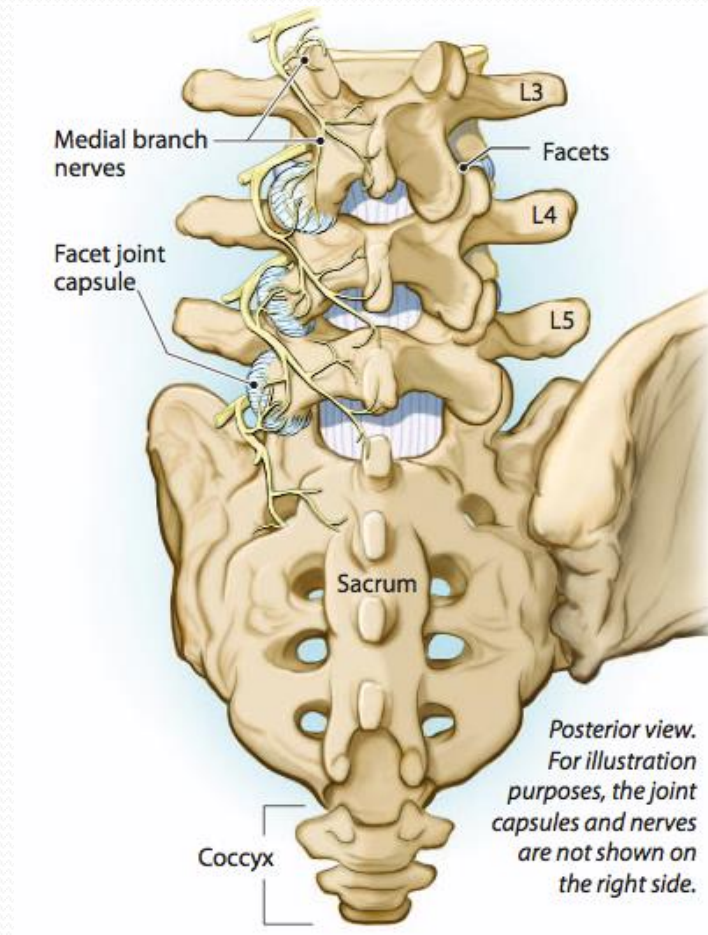
- Resist compressive forces of the spine in conjunction with the discs
- Assume more shearing force in the lordotic position
- With spine rotation, they undergo the most strain
- Protect the disks by preventing excessive movement¹



¹Schmidt H, Heuer F, Wilke HJ. Interaction between finite helical axes and facet joint forces under combined loading. Spine. Dec 1 2008;33(25):2741-8.

Innervation of the facet joint

- Each facet is innervated by the medial branch from the level *above and below* the joint.
- Therefore the L4/5 facet is innervated by the L4 medial branch as well as the L5 medial branch



Pathophysiology

- Degeneration of the joint itself from repetitive injury
- Hyperextension injuries



Pathophysiology

- Increased wear on joint secondary to desiccated disk

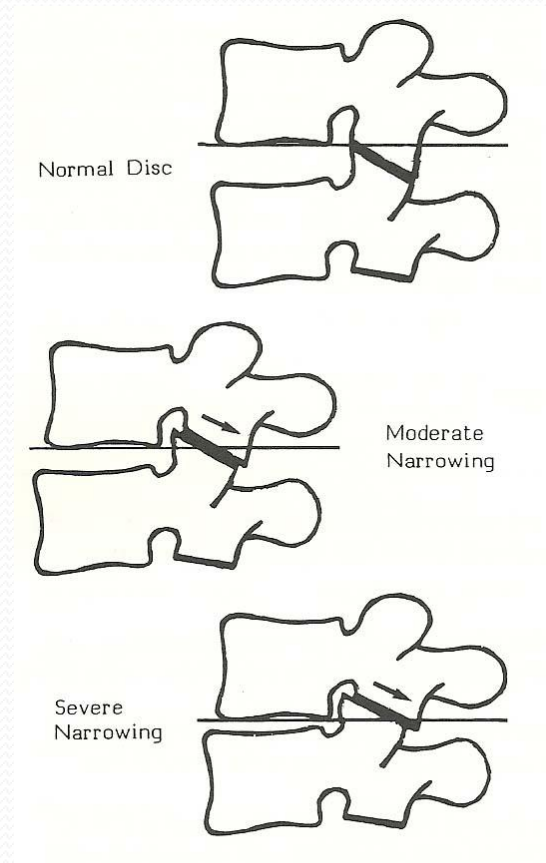


Figure 5.24. Effects of various degrees of IVD thinning on the IVFs and facets (Courtesy ACAP).

Facet syndrome

- Defined as any pain that arises from the facet joints
 - Fibrous capsule, synovial membrane, bone, cartilage
- Approximately 27⁰% prevalence rate of patients with LBP in a 2004 paper by Manchikanti using diagnostic blocks.

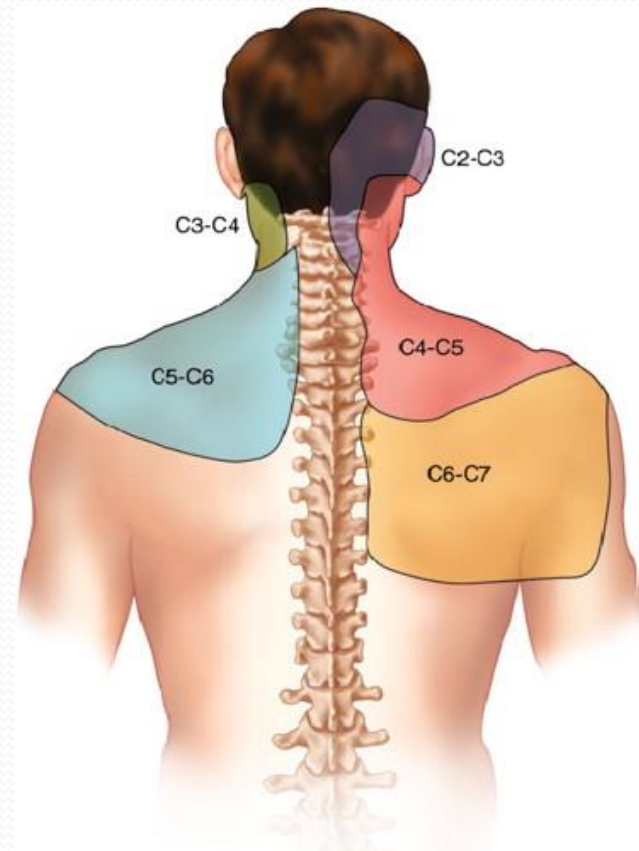
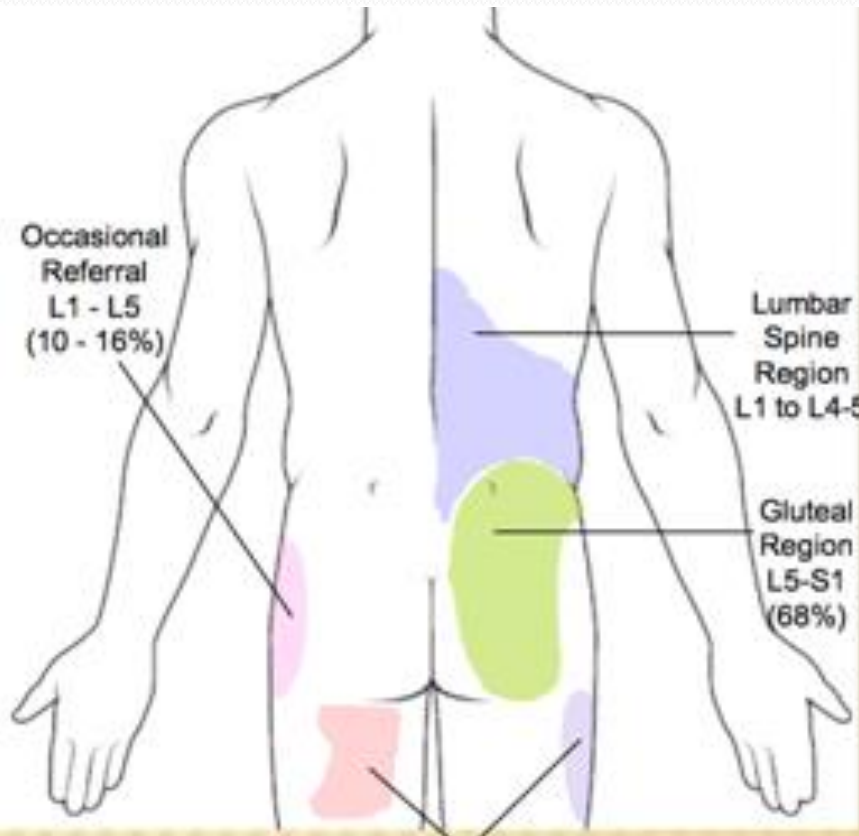
Facet syndrome diagnosis

- Physical Exam:
 - Predominance of axial spine pain
 - Provoked with extension and rotation (max force)
 - Does not usually radiate below knees
 - Pain with palpation of facet joints
 - Deep and aching pain
 - Usually worse in the morning, better with activity

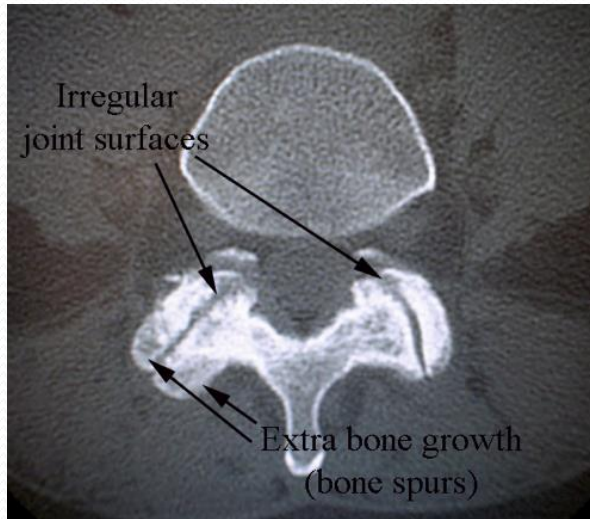
Radiation patterns of facet arthropathy

Lumbar

Cervical



Facet Syndrome diagnosis: not radiologic



“Interestingly, the number of Studies demonstrating a positive correlation between radiological abn and the response to diagnostic blocks is roughly equivalent to the number showing no correlation.”¹



RIGHT ANTERIOR OBLIQUE

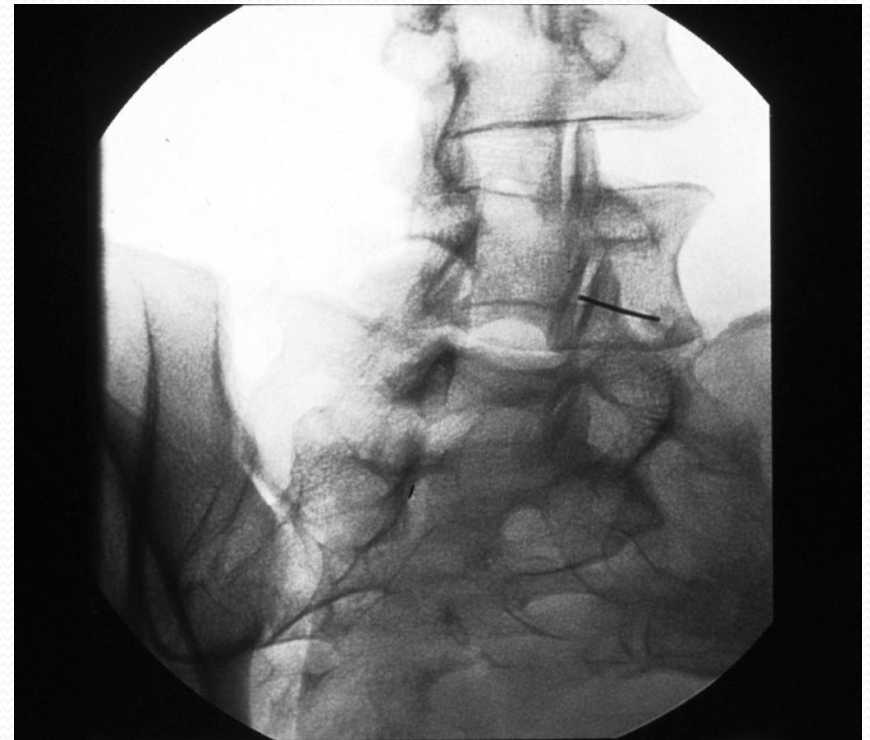
Zundert et al Evidence Based Interventional Pain Medicine, 2012. pg 88.

Who to refer for facets?

- Patients who have failed conservative treatment
 - Medications
 - Physical therapy
 - Weight loss
- Lack of concerning neurological symptoms
 - Lack of paresthesias
 - Red Flag symptoms
- If no neurological findings plain films are sufficient

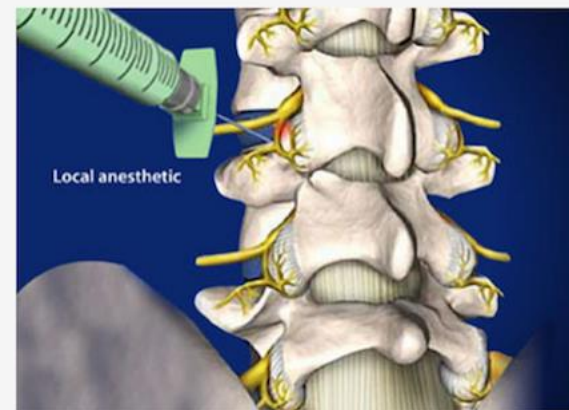
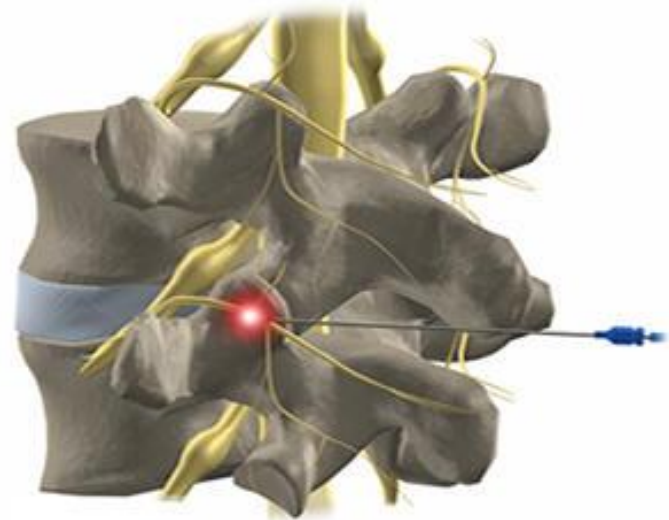
Interventional Therapy for Facet Syndrome-steroid injection

- Traditional “classic” treatment includes steroid/LA injections into the facet(s)
- Used as a therapeutic and diagnostic tool
- May be a good option for patients not thought to be good candidates for RFA



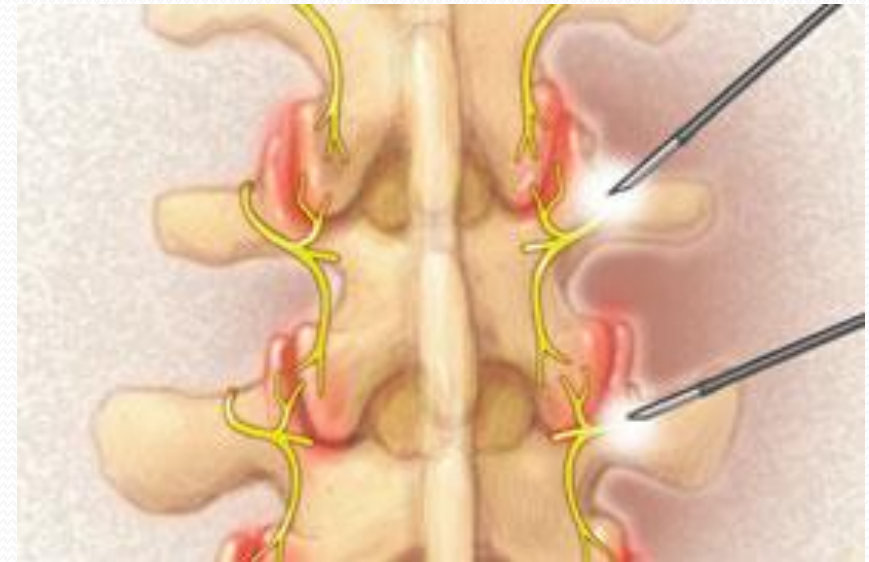
Diagnostic Medial Branch block

- Fluoroscopy always used
- Sedation is not given for diagnostic block
- Small amount (1 ml) of local anesthetic placed on the target nerve(s)
- Patient is asked to fill out a pain diary before procedure and then *every hour for the rest of the day*
- Positive test indicated by >70% pain relief *



Radiofrequency Ablation

- Indicated by a positive response to diagnostic test(s)
- First controlled study in 1994¹
- Numerous double blind studies show improvement²

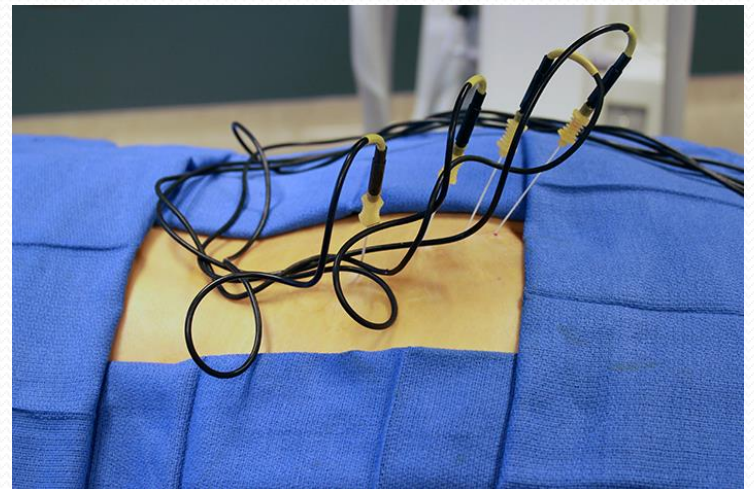


¹Gallagher et al. Radiofrequency facet joint denervation in the treatment of low back pain-a prospective controlled double blind study to assess its efficacy. *Pain Clinic*. 1994 193-198

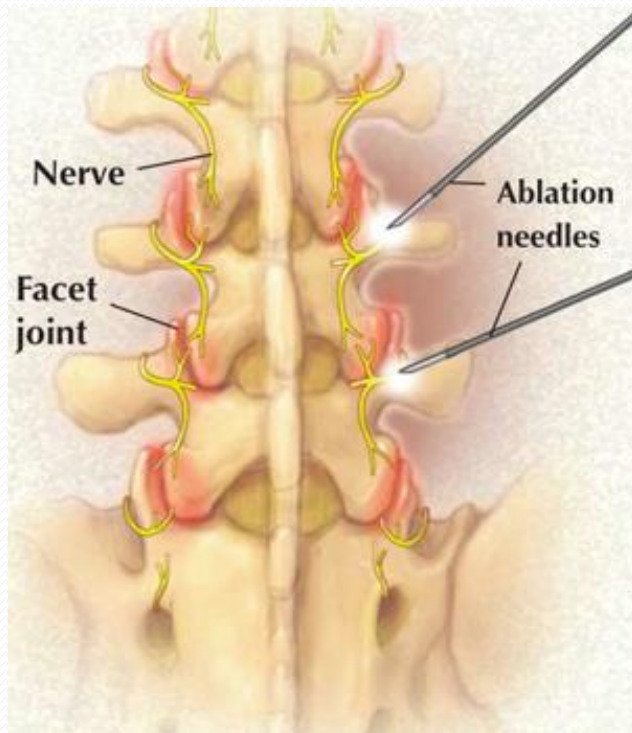
²Nath et al. Percutaneous lumbar zygapophysial joint neurotomy using radiofrequency current, in the management of chronic low back pain: a randomized double-blind trial. *Spine*. 2008; 33:1291-1297.

What is radiofrequency ablation?

- Placement of a needle with a electrode (active tip) in the position of the previously anesthetized nerve
- The electrode is tested for motor and sensory sensation (repositioned if positive*)



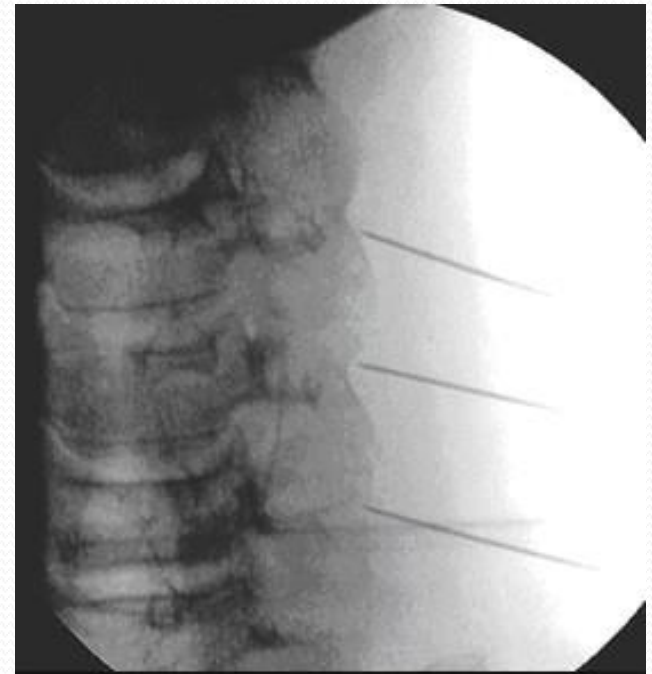
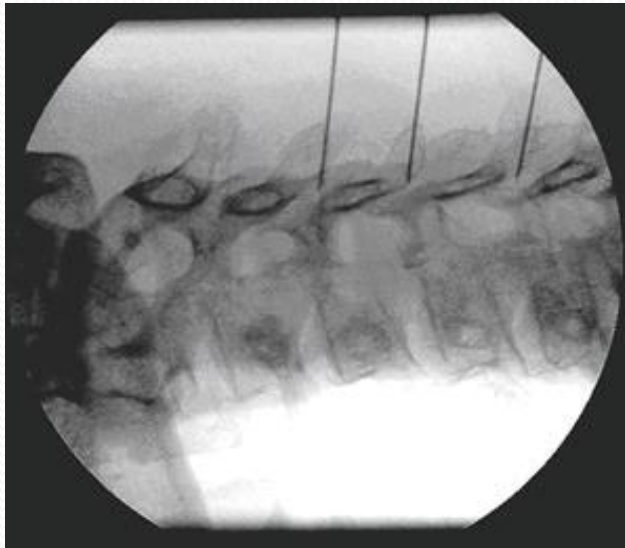
Radiofrequency ablation (cont)



A lesion is then generated using the electrode. The lesion is created by heating the electrode up to at least 80° C for 60-90 seconds. Several lesions are made. Sedation is given.

RFA (cont)

- Can also be done for cervical facet arthropathy
- Different cannulae (smaller) are used



RFA (cont)

- Considered the “gold standard” for facet arthropathy
- When compared with sham procedure after 6 months¹
 - Significant improvement of pain
 - Global perception of pain improved
 - Improved quality of life
- Note: In some cases, the procedure needs repeating.
 - Repeat procedures have a very high success rate
 - Repeat procedures last as long, if not longer than the original procedure.

¹Nath, S et al. Percutaneous lumbar zygapophysial joint neurotomy using RF current, in the management of chronic low back pain: a randomized double-blind trial. *Spine*. 2008; 33: 1291-1297.

Myofascial back pain

- Very tender and usually localized
- Temporarily responsive to manual techniques
- Treatments include
 - TPI's
 - PT/stretching
 - Core strengthening
 - Long term
 - Some medications
- Secondary to other injuries
 - Need to decrease myofascial pain first



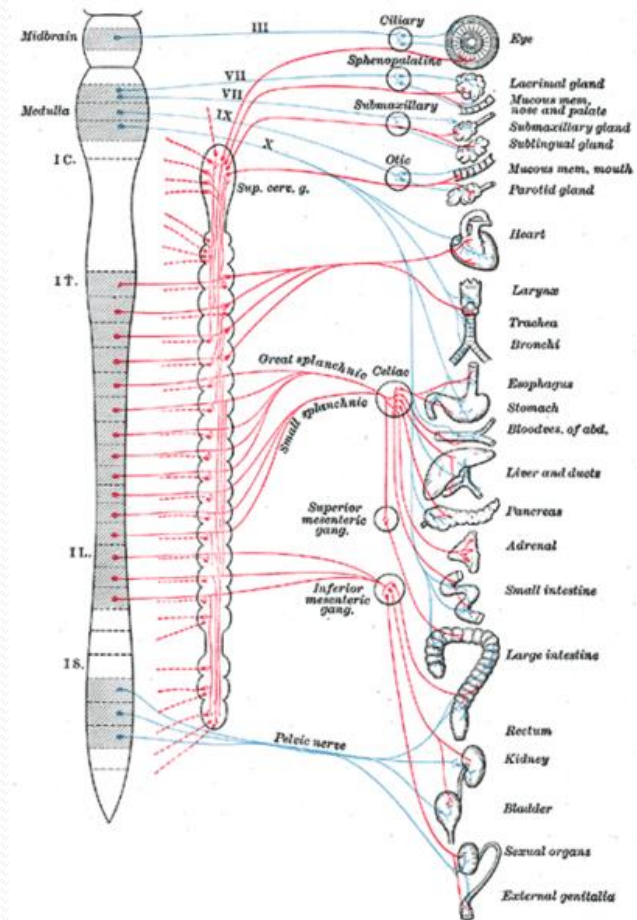
Low back pain key points

- Radicular pain/neurological symptoms
 - MRI indicated
- Axial pain
 - First try to delineate myofascial pain and treat
 - Improve core strength
 - If no improvement despite efforts imaging and referral

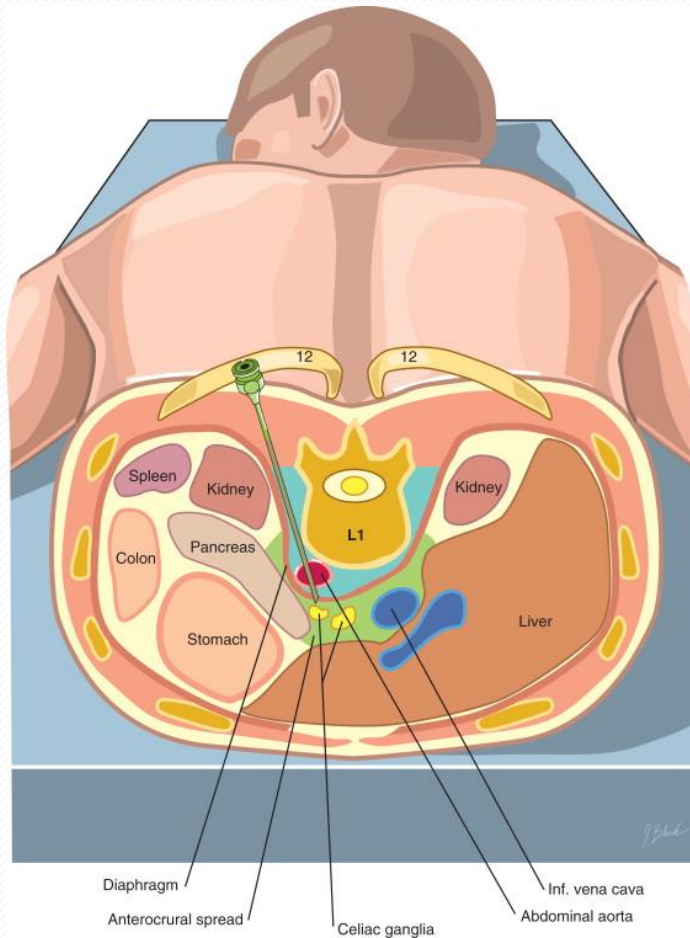


Palliative Procedures

- Go to the front of the line
- Celiac plexus block, hypogastric block
- Region specific
 - Pancreatic CA → Celiac
- Deep procedures with increased risk
 - Coagulation dependent
- Alternative pain control methods should be exhausted



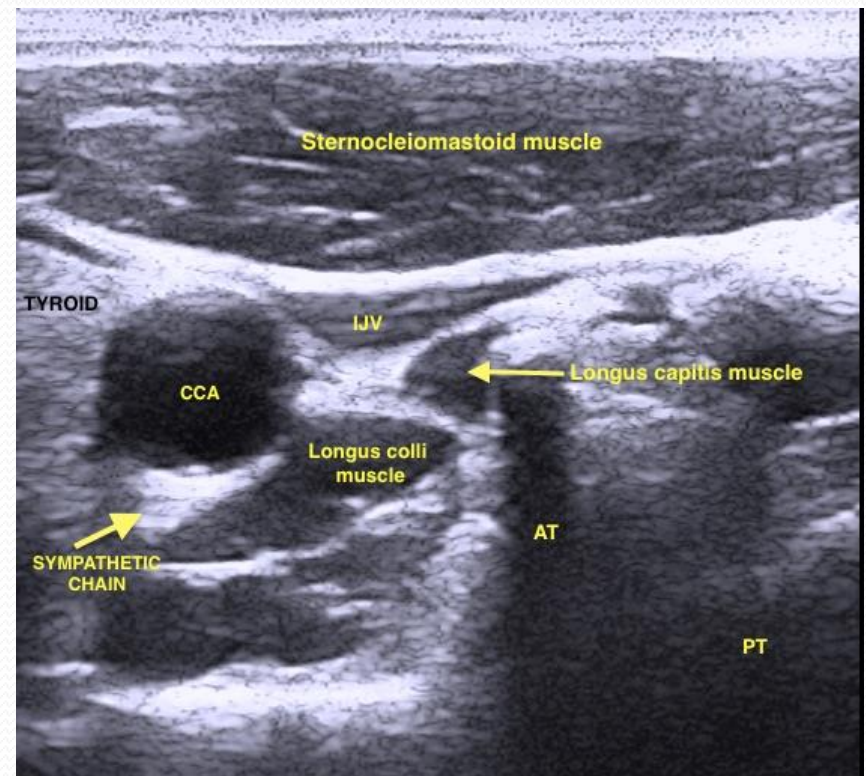
Celiac/Splanchnic nerve block/neurolysis



- Refractory pancreatitis
- Foregut pain/lesions
- Pancreatic CA

Sympathetic blocks

- Usually CRPS related
 - Stellate ganglion
 - Lumbar sympathetic block
- Can also be used for vascular insufficiency



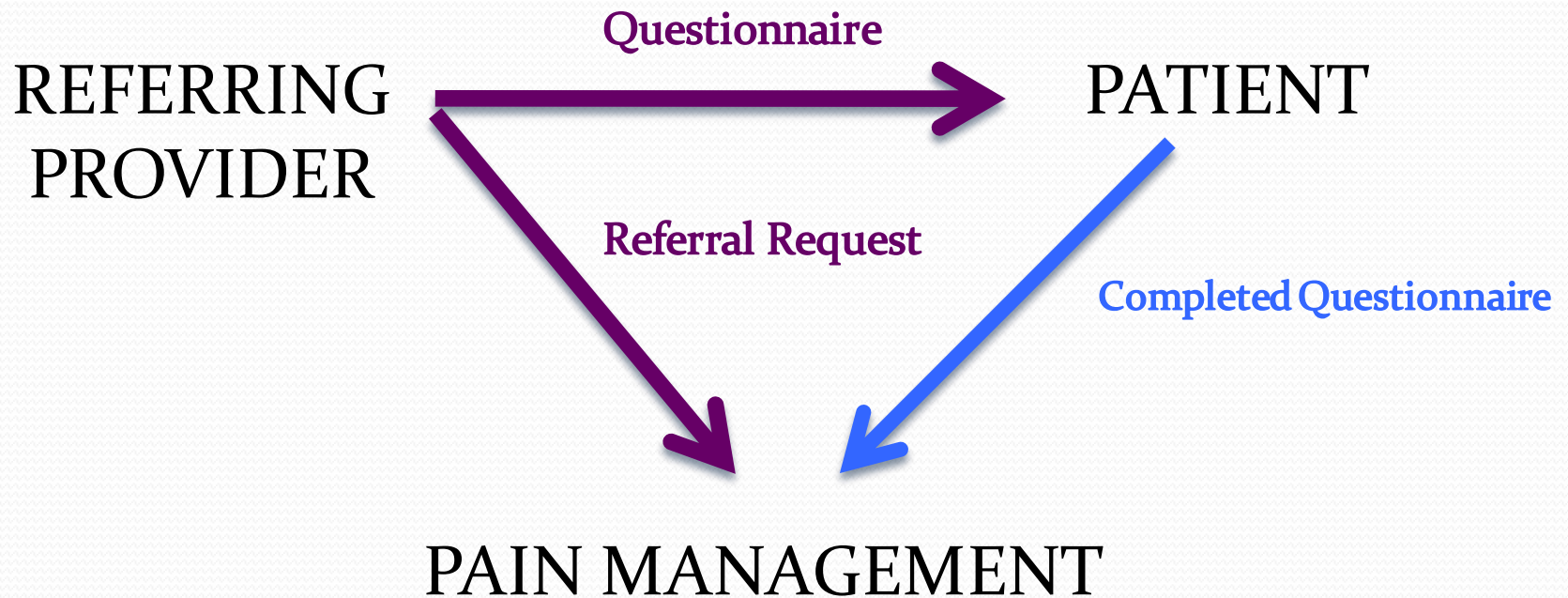
How to refer?



In general...

- Same basic principles of other referrals...
 - Reliable, reasonable, follows instructions
- Specific to pain referrals, best case scenario
 - Patients with localized pain
 - Pain provoked with reproducible exam
 - Decision about whether a patient is more appropriate for *addiction medicine, rheumatology, neurology, orthopedics*

Referring Patients to the Pain Management Center

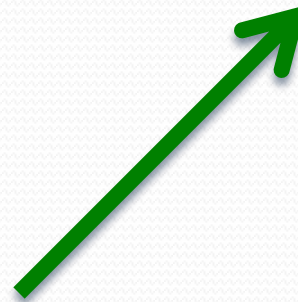
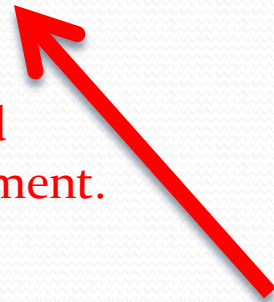


Referring Patients to the Pain Management Center

REFERRING
PROVIDER

PATIENT

Patient not felt to be a good
candidate for pain management.



Patient is a good
candidate, called
to schedule. Recs
made.

PAIN MANAGEMENT

After the questionnaire and the referral request have been received, either the provider will be contacted, or the patient will be called to schedule an appointment.

Tips for referring to pain management

- Outside surgeries or procedures with referral
- Illicit drug use
 - Clean for 6 weeks with clean UA (THC ok)
- Steroids
 - Case by case
 - 6 weeks from a dose pack
 - Diabetics (A1c <10)
- Imaging-must have an MRI for cervical or lumbar radicular
 - <4 years old
 - Plain films for non-radicular pain

(cont) Tips for referring

- Surgeries
 - 6-8 week delay after a non bony uncomplicated surgery
 - If bony surgery, dependent on complexity, surgeon approval
- Blood thinners
 - Pain Procedures per ASRA guidelines
 - <https://www.asra.com/asra-news/article/199/updates-to-the-asra-guidelines-for-inter>, 2018
 - Discontinued blood thinner must be approved by team who recommended them



QUESTIONS?