Beyond the Pill: Interventional Pain Options Every PCP Should Know

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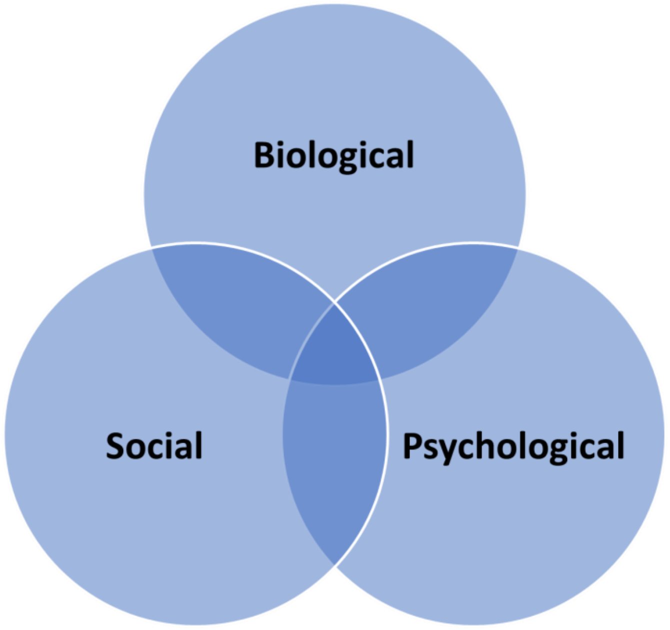
Learning Objectives

- Expand awareness of evidence-based non-pharmacologic and interventional options
- Recognizing when medication management is less ideal and what to do next
- Understanding the main interventional pain techniques available
- Improving referrals and communication with pain specialists
- Appreciating YOUR role in multimodal care

Pain Pyramid

- <u>Acute pain</u>: quick, due to injury/illness, lasts <3-6 months
- <u>Chronic pain</u>: long, persistent, duration outlasts expected healing
    - Serves no physiologic purpose
- My job: Pain <u>*Management*</u>

1. Education/Movement/CBT [active]
2. Pharmacology [passive]
3. Interventional [passive]
4. Surgery [passive]



A problem: Overreliance on Pills

Who here enjoys prescribing pain medications?

Opioids

LTOT, disability, QoL. 2022.

We learned:

- Short term analgesia does not mean long term benefit
- Tolerance led to dose escalation, which led to tolerance
  - Dependence and side effects with dose escalation
- Higher doses led to increased pain intensity, and diminished function

The Evidence:

- Worse pain and disability scores in LTOT (vs matched non-users)
- Higher rates of depression, anxiety, and catastrophizing
- Reduced sleep quality and immune fuction
- Higher risk of overdose, hormonal suppression, and falls
- No functional advantage over non-opioid regimens

Opioid induced adverse effects. 2021.

Takeaway:

- LTOT likely sensitizes pain pathways and reduces resilience

Chronic “Pain Meds”

Tylenol/NSAIDs/Steroids

Gabapentinoids

Antidepressants

Anticonvulsants

Muscle relaxers

All have a place, but none are built for the complexity of chronic pain.

- CDC, VA, & NIH all advocate for multimodal care, yet most systems will default to pharmacology

When meds are less ideal…

- Stable pain score, but function is stalled
- Needs dose escalation or juggling multiple meds without clear benefit
- Side effects limiting the efficacy of the medications
- Severe, focal pain less suited for systemic therapy

Categorization of Pain

- Nociceptive: tissue damage, inflammation → arthritis or strain
- Neuropathic: nerve injury → postherpetic neuralgia
- Nociplastic pain: central sensitization → fibromyalgia

- Interventional pain is most well suited for nociceptive and neuropathic pain types
- Nociplastic pain will always do better with education, sleep, movement, cognitive-behavioral work
    - Less benefit from needles, more from the hard work of reprogramming the pain modulation system
- Nociplastic + Nociceptive pain is common


DISTRACTION TOOLBOX
Hospital MadLibs
Fill in the blanks or use the guide on the back.
DISTRACTION TOOLBOX
THIS TOOLBOX BELONGS TO:
PAMI
Pain Assessment and Management Initiative
Small Parts-Not for Children Under 3 Years Old
NON-TOXIC
WIKKI STIX
ONE VOICE
One voice should be heard during the procedure.
Need for parental involvement.
Educate the patient before the procedure about what is going to happen.
Validate a child with your words.
Offer the patient the most comfortable, non-threatening position.
Individualize your game plan.
Choose appropriate distraction/coping techniques to be used.
Eliminate unnecessary staff who are not actively involved with the procedure.
Doctor
Sweet-Ease
Natural
Preservative-Free Sucrose Solution

My Toolbox

Broad Injection Categories

- Diagnostic and Therapeutic
- Radiofrequency Neurotomy
- Neuromodulation
- Vertebral and Disc Interventions
- Joint and Peripheral nerve procedures
- Sympathetic chain blocks
- Regenerative and Emerging Therapies

Trigger Point Injections

- Local anesthetic +/- steroid into myofascial "trigger points"
  - Interrupt the spasm and nociceptive output
- For myofascial pain, headache, regional muscle pain
- This is a safe, office based procedure and can improve PT tolerance
- Efficacy: better **short term** relief than medications alone
  - Both lidocaine and dry needling work
- Reassess and pair with PT/active rehabilitation plan
- No clear evidence that adding steroid improves durability or pain vs LA alone
- "trigger point injections were effective in reducing pain scores compared to medical treatment (SMD = -2.09)"

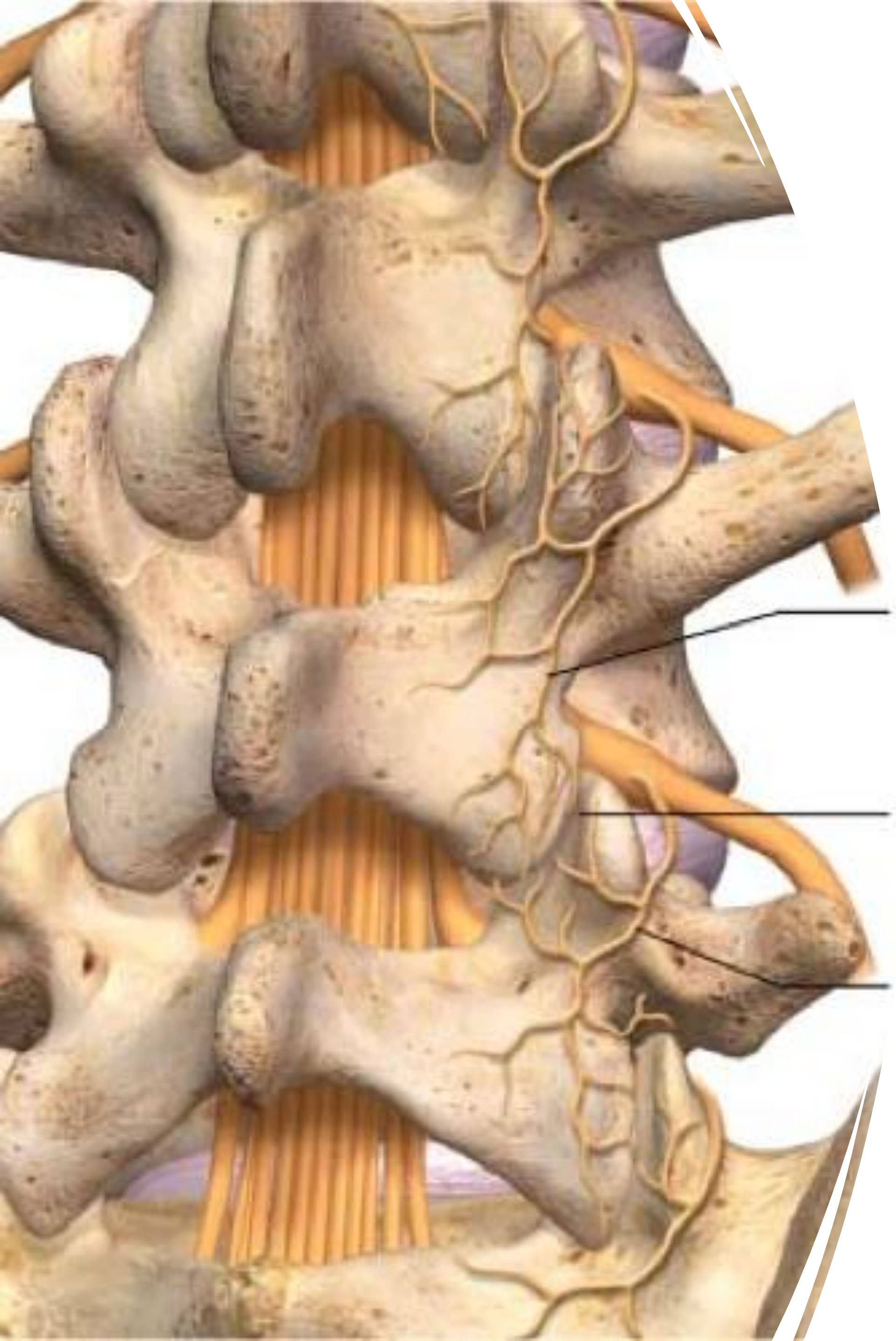
Warning

Chronic steroid administration:

- Accelerated cartilage loss
- Tendon degeneration and increased risk of rupture
- Local skin atrophy, soft tissue thinning
- Systemic absorption = hyperglycemia, adrenal suppression, bone density loss
- Waning returns

40mg of triamcinolone = peak suppression of cortisol, ACTH 2-3 days after injection

- Full recovery took 4 weeks for ACTH, and cortisol took 5 weeks
- Epidural steroid injection 20mg vs 40mg showed:
  - 40mg had longer HPA suppression 19.7+/- 3.1 days vs 8 +/- 2.4 days
- Complications for physiological stress (surgery/infection)

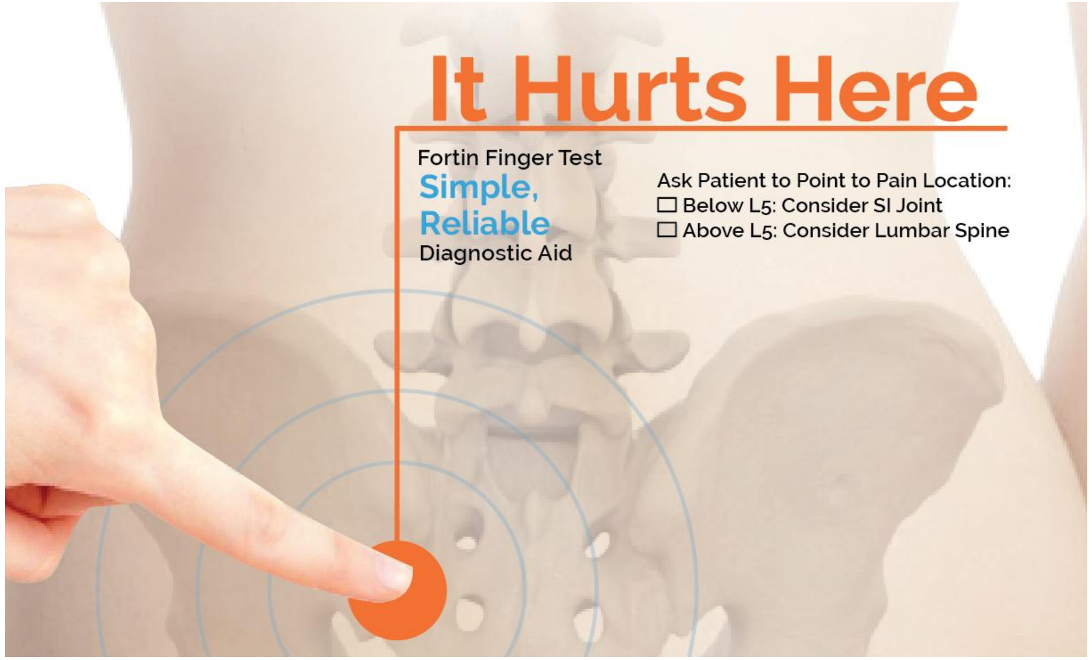


Facet Joint/Medial Branch Blocks

- Localized “axial” back or neck pain worse with extension
  - Sequelae of lumbar spondylosis
- Very frequent cause of back “ache”
  - More pain with extension, rotation – but not truly radicular symptoms
  - Predictable referral patterns
    - Minimal pain below the knee
- Gold standard for diagnosis: Medial Branch Blocks
- Medial branch block #1 → 80% minimum improvement
  - TEMPORARY
- Medial branch block #2 → 80% minimum improvement
  - TEMPORARY
- Medial branch radiofrequency ablation
  - Goal of 6-12 months improvement

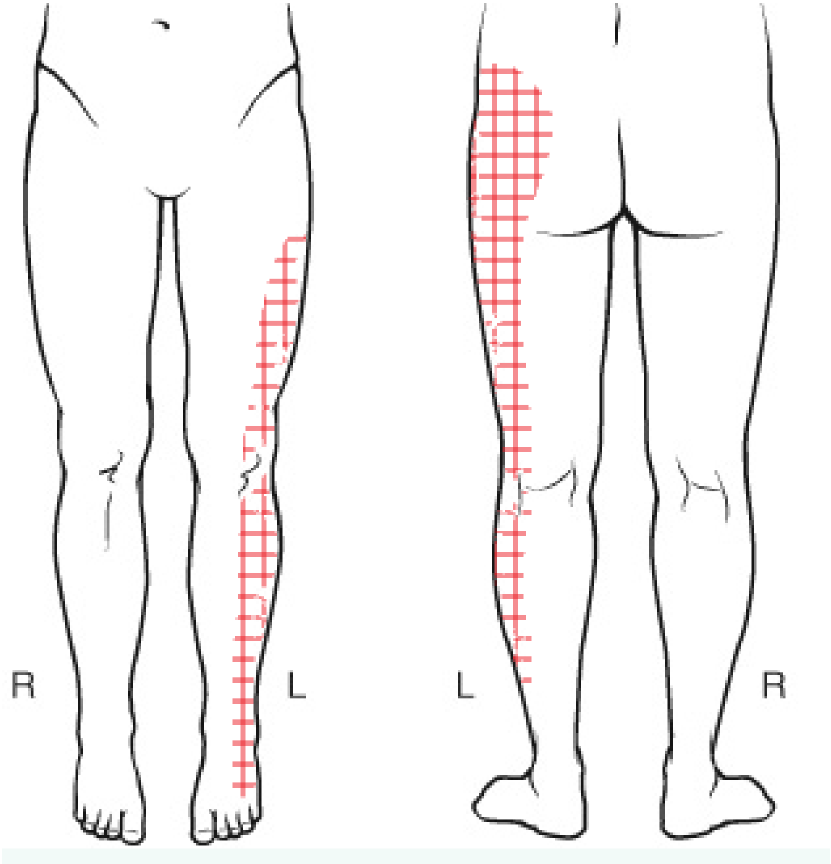
Sacroiliac Joint Injections

- 15-25% of LBP (getting out of car, rolling over in bed)
  - Common after spine surgery, pregnancy, trauma, hip replacement
  - More “lateralized” than facet pain
- Pain into buttocks or posterior thigh
- Provocative tests aid diagnosis
  - Close proximity of SI joint to L5-S1 facet joint
- PT can often fail if not focused on SI
  - Flexion exercises vs stabilization of pelvic ring
- Confirm with diagnosis SI joint injection
- Long term responses vary
- Typical reduction is around 3 points on NRS (0-10)



Epidural Steroid Injection

- Radicular pain from disc or stenosis
- Best in acute/subacute situations (<6 months)
  - Function focused outcomes >>> NRS
- Steroid in epidural space → reduces nerve root inflammation
- Better evidence to reduce leg pain (radiating pain)
- Beyond 3-6 months, much less conclusive
- Expectation: buy time and improve function
  - NOT a "cure"
- Legitimate diagnostic doubt regarding SNRB



- Reviewed RCTs of epidural and facet injections for chronic LBP
  - 34 pain and interventional societies called for retraction
- Conclusion: for mechanical LBP – without radiculopathy – injections did not produce sustained improvement beyond 3 months
  - ~~"Injections don't work"~~
- Criticisms:
  - Pooled diverse patient populations, without consistent diagnostic work up
- Injections work best as a multimodal plan, not a blanket therapy
  - Guided framework with coordinated follow up
  - This is a model PCPs can help build!
  - PCP ↔ Pain Specialist ↔ PT/Behavioral Health → Improved Function & Lower Medication Utilization
    - When PT, Pain Management, PCP communicate there is 20-40% improvement in functional gains

PRACTICE

Check for updates

For numbered affiliations see end of article.

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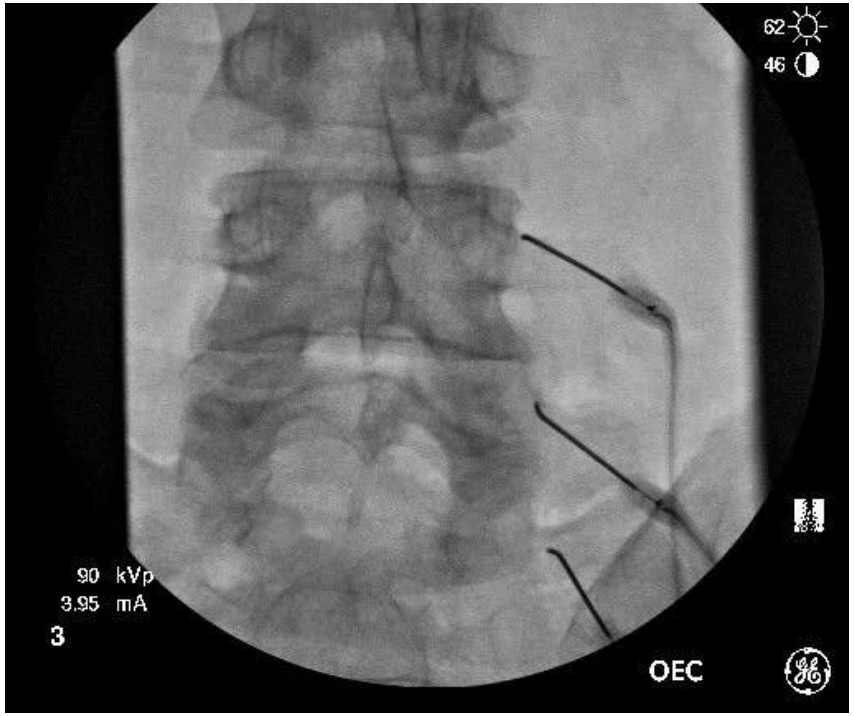
RAPID RECOMMENDATIONS

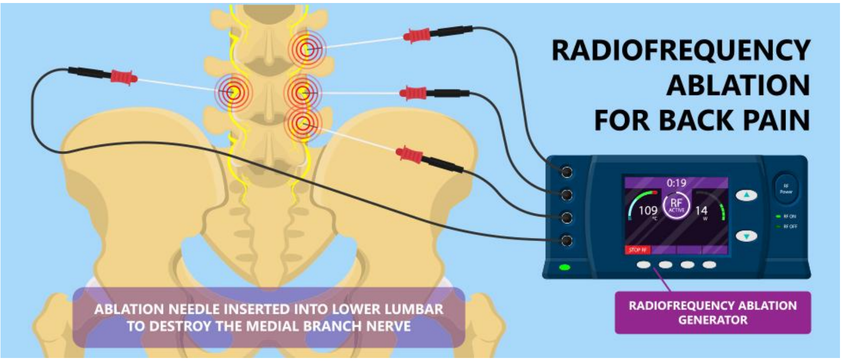
Commonly used interventional procedures for non-cancer chronic spine pain: a clinical practice guideline

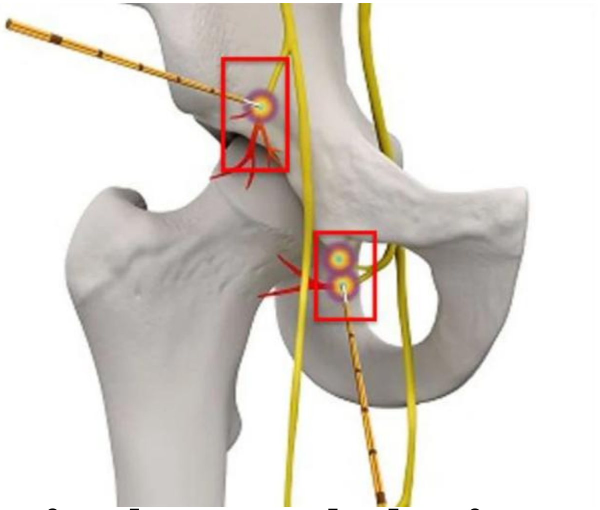
Jason W Busse,[1,2,3] Stéphane Genevay,[4] Arnav Agarwal,[2] Christopher J Standaert,[5] Kevin Carneiro,[6] Jason Friedrich,[7] Manuela Ferreira,[8] Hilde Verbeke,[9] Jens Ivar Brox,[10,11] Hong Xiao,[12] Jasmeer Singh Virdee,[13] Janet Gunderson,[14] Gary Foster,[15] Conrad Heegsma,[15] Caroline F Samer,[16,17] Matteo Coen,[18,19] Gordon H Guyatt,[2] Xiaoqin Wang,[2] Behnam Sadeghirad,[2,3] Faheem Malam,[20] Dena Zeraatkar,[2,3] Per O Vandvik,[21] Ting Zhou,[22] Feng Xie,[2] Reed A C Siemieniuk,[2] Thomas Agoritsas[2,18,23]

Medial Branch Radiofrequency Ablation

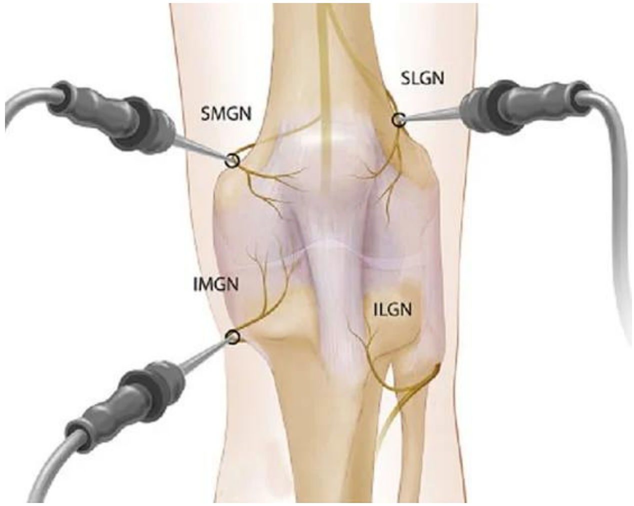
- Nerve blocks only last as long as it takes to metabolize
- Radiofrequency ablation offers a relatively long term solution via protein denaturation
- Requires "proof of concept" via diagnostic block
- Repeat every 6-12 months
- Cervical – Thoracic – Lumbar







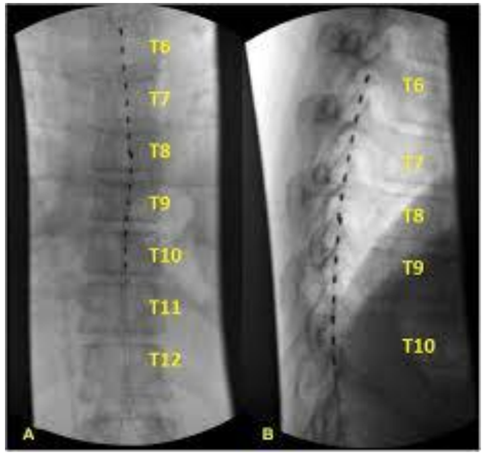
Peripheral Joint Radiofrequency Ablation



- Genicular RFA = the knee
  - 6-12 months improvement, low complication rate
  - Chronic knee pain refractory to IA steroid, post-TKA pain
  - 2023 meta analysis showed VAS -4.0
- Hip RFA = femoral and obturator branches to anterior joint capsule
  - 6-12 months of improvement
  - Post-THA, OA refractory to conservative care, osteonecrosis
  - 2022 meta analysis showed Mean NRS -3.4, 60% were 50% better at 12 months
- Shoulder RFA = suprascapular, axillary, and lateral pectoral nerves
  - 6-12 months of improvement
  - 2022 meta analysis showed moderate quality evidence for reduced pain and functional benefit (average -4-5pts on NRS)

Spinal Cord Stimulation

- Neuropathic pain only = CRPS, Failed back, diabetic neuropathy, chronic radiculopathy
- 50-70% report > 50% reduction, improves QoL, functional outcomes
- Failed conservative care + Appropriate anatomy + Psych Eval
- This is an implanted system to modulate, not block pain signaling
- Gate Control Theory – active Abeta fibers, inhibit C fibers (1965)
  - More complex alteration of neurotransmitter balance such as increased GABA, serotonin, norepinephrine and decreasing glutamate + substance P to shift towards pain inhibition
  - Stimulation of periaqueductal grey, RVM to enhance endogenous analgesia
- Leads in epidural space C2-4 for cervical, T8-10 for low back and leg pain
  - IPG in flank or buttock + patient controller
- Trial followed by implantation

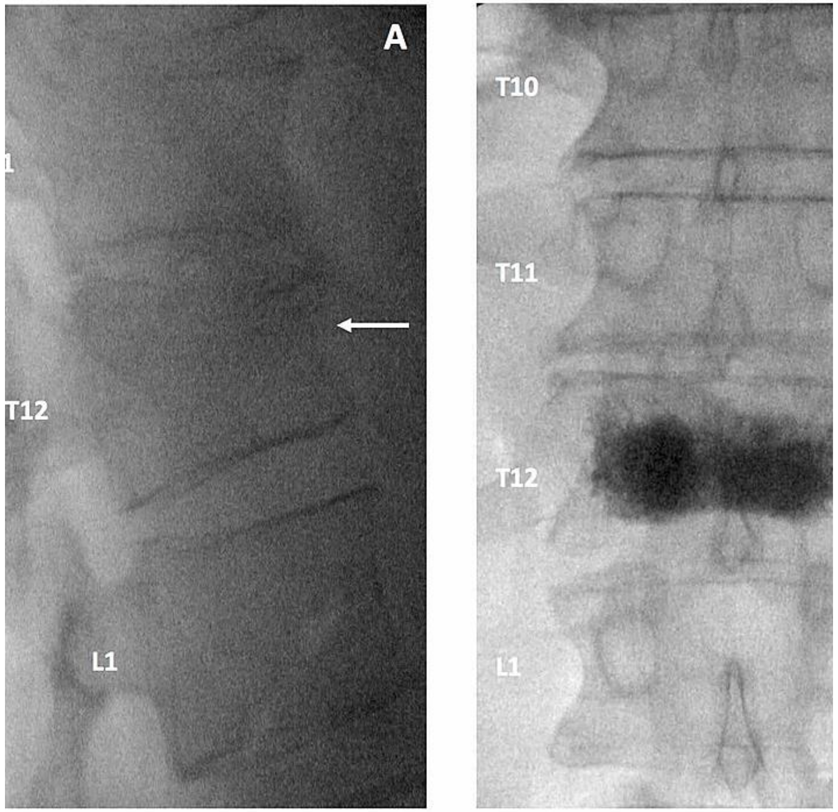


Dorsal Root Ganglion Stimulation

- Similar concept to spinal cord stimulation, except the target is the dorsal root ganglion
- Focal neuropathic pain such as CRPS
  - High precision targeting
  - Low voltage stimulation with less paresthesia
- Complicated, difficult placement
- Specificity makes it difficult to use broadly

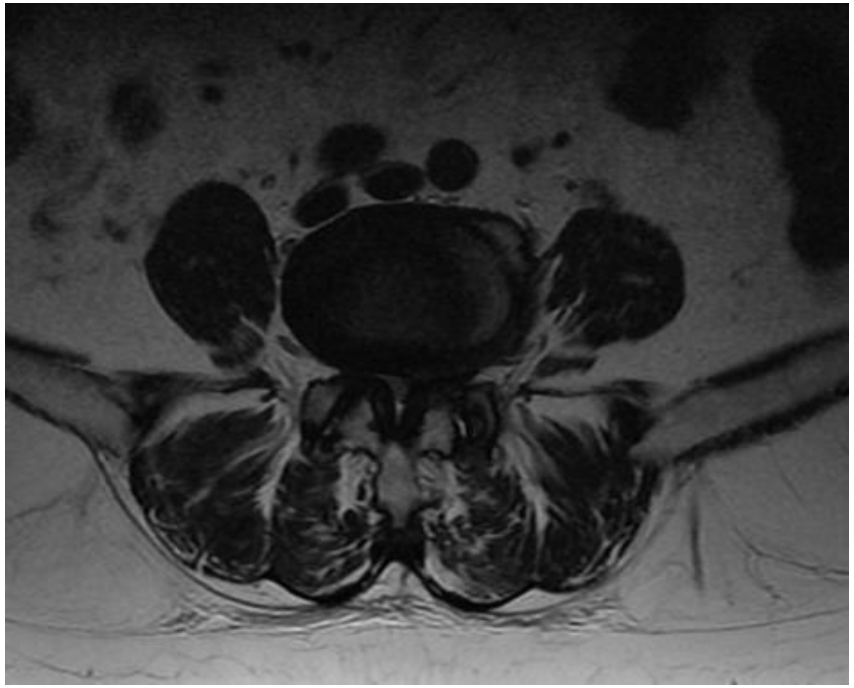
Kyphoplasty

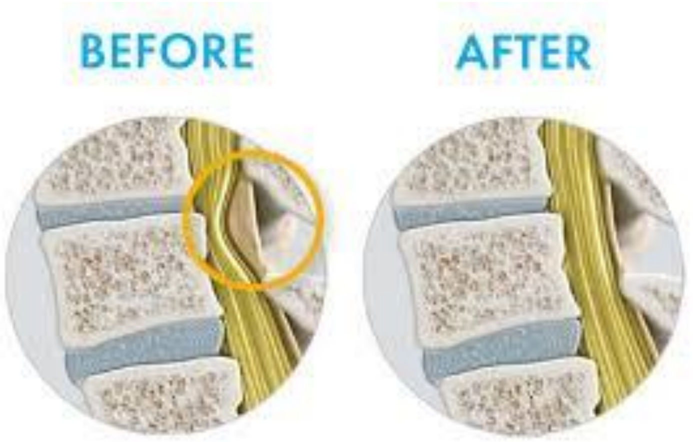
- Osteoporotic compression fractures
- Rapid relief, to promote functional outcomes
  - Generally not to restore vertebral height, but to improve pain faster
  - Should be done within the first 4-6 weeks of a fracture
- Shows improved disability, QoL, fewer adjacent level fractures, decreased M&M
- Requires advanced imaging and failure of conservative care
  - Unless admitted to the hospital
- Focus on early treatment of osteoporosis



MILD

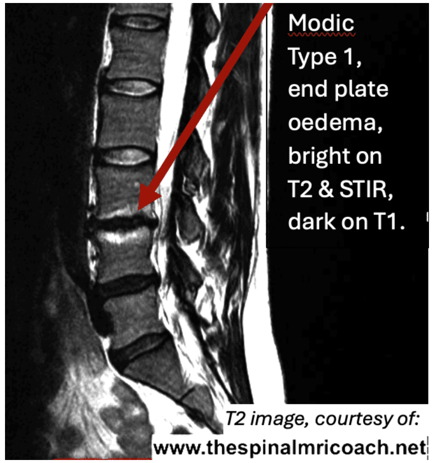
- Minimally invasive lumbar decompression
- Remove hypertrophic ligamentum flavum
- Improves walking distance, standing tolerance
- 88% avoided subsequent spine surgery at 5 years
- Outpatient





Basivertebral Nerve Ablation

- Discogenic pain / Vertebrogenic pain
- Pain with flexion with or without radiculopathy
- Modic changes on MRI, damaged vertebral endplates
  - Radiofrequency ablation of the basivertebral nerve via a transpedicular approach
- Treatment of disc related pain remains elusive
- Avg NRS reduction = 4, improved ODI



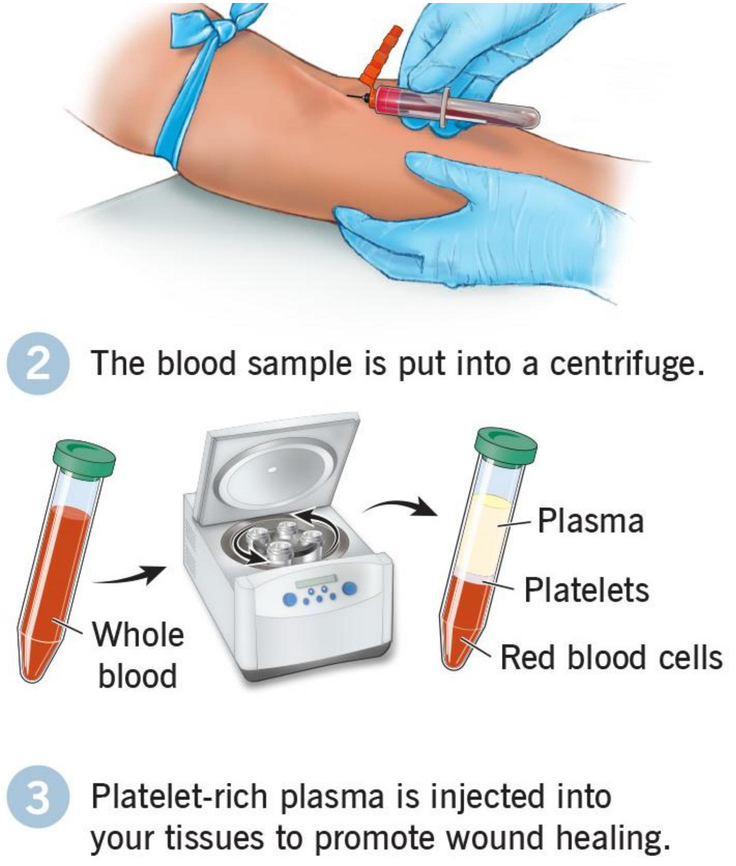
T2 image, courtesy of:
www.thespinalmricoach.net

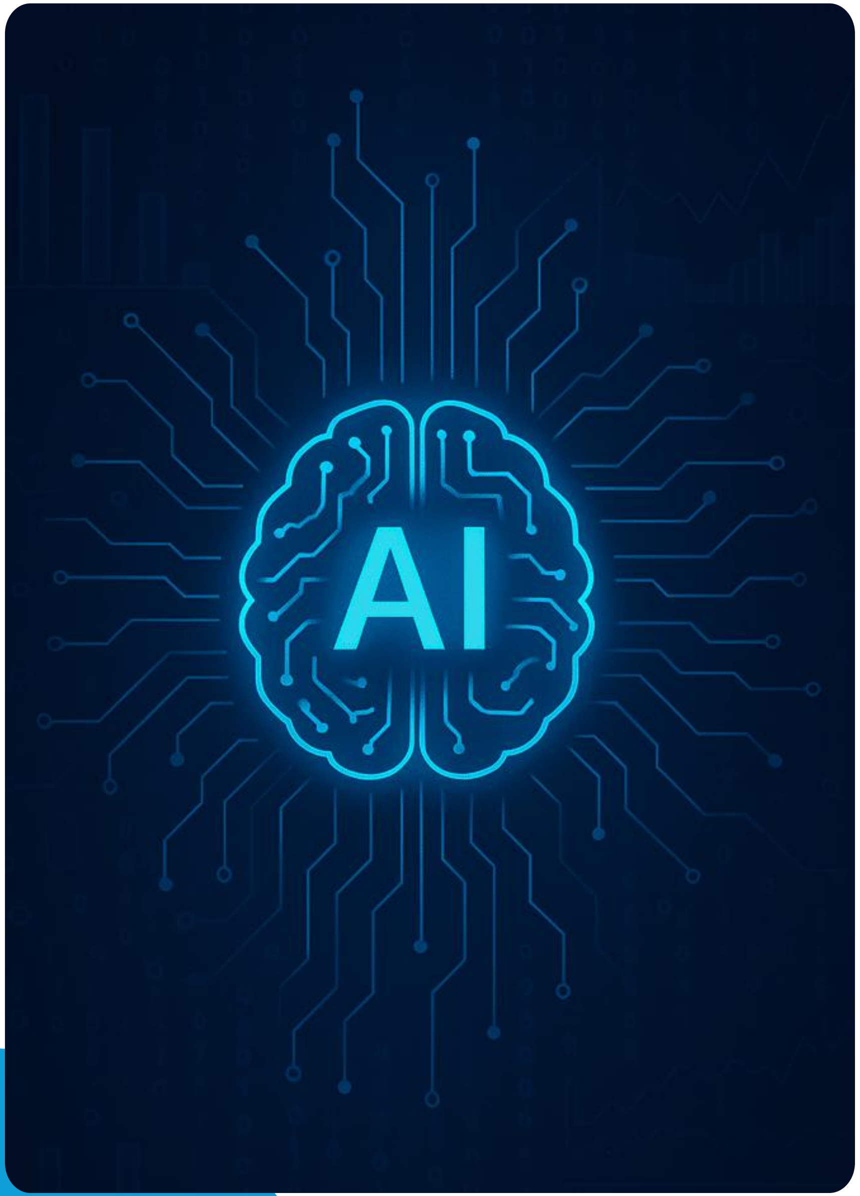
Sympathetic Blocks

- Focal blockade of autonomic pain circuits
- Stellate Ganglion = CRPS, hot flashes, long-COVID, PTSD, GAD, migratory pain, cardiac arrhythmia, *a bad golf game*
- Lumbar Sympathetic = CRPS, ischemic pain
- Celiac/Sup Hypogastric Plexus = visceral pain
- Targeting dysregulated sympathetic nervous system discharge
- Not guaranteed cures, often adjuncts

Regenerative Medicine

- PRP – tendons, joints, discs
  - Limited evidence for spine, moderate for tendinopathy
- Stem Cell – joints, discs?
  - Limited data





WISeR

- "oversight of interventional procedures"
- Goal to analyze documentation with AI and compare against LCD
- High volume specialties – for pain, this includes ESI, MBB/RFA, SCS
- Increasing burden to document duration and failure of conservative care
- Objective findings
- Functional limitation
- Denials and delays likely to increase in the short term

Take Home

- Chronic pain is complex
- Early identification → better outcomes
  - Biologic – Psychologic – Social
- Procedures complement, not replace, holistic care
- The best referrals include thoughtful trial of conservative care