

OREGON  
HEALTH  
& SCIENCE  
UNIVERSITY



# Aches and Pains: Some Simple Interventions

Presented by: Kim Mauer MD, MBA

# Agenda

Procedures  
(new and  
old)

Tricks of the  
trade

Review of  
some  
essentials

# What is Pain?

- An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage



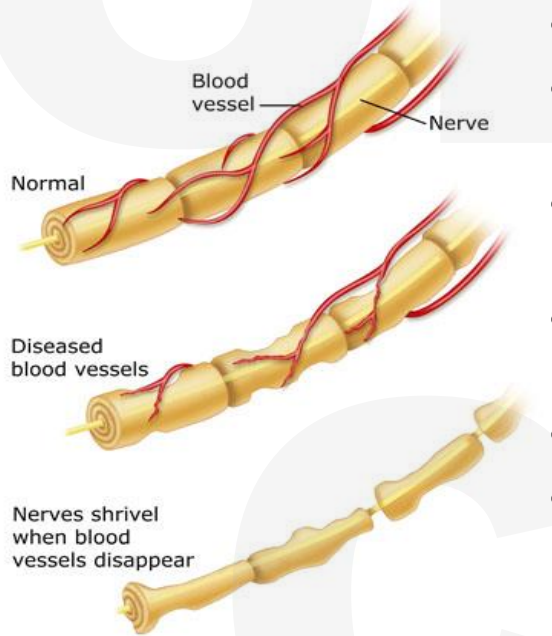
Merskey H, Bogduk N (eds). *Classification of Chronic Pain*, 2nd ed. IASP Press, Seattle, 1979.

**\$560-635 Billion**  
**\$100 million**  
**9% increase**



# Some concepts

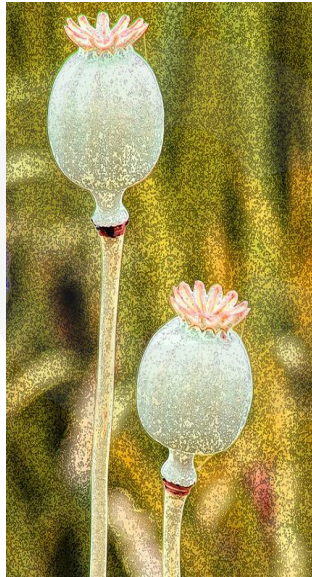
Diabetes Affects the Nerves



- The pain is caused by physiology gone awry
- Most nerve damage does not lead to ongoing pain
- Severity of the damage does not correlate well with severity of pain
- No test tells us if a person has pain or how bad it is
- The entire nervous system can be involved
- Pain can change everything in a person's life

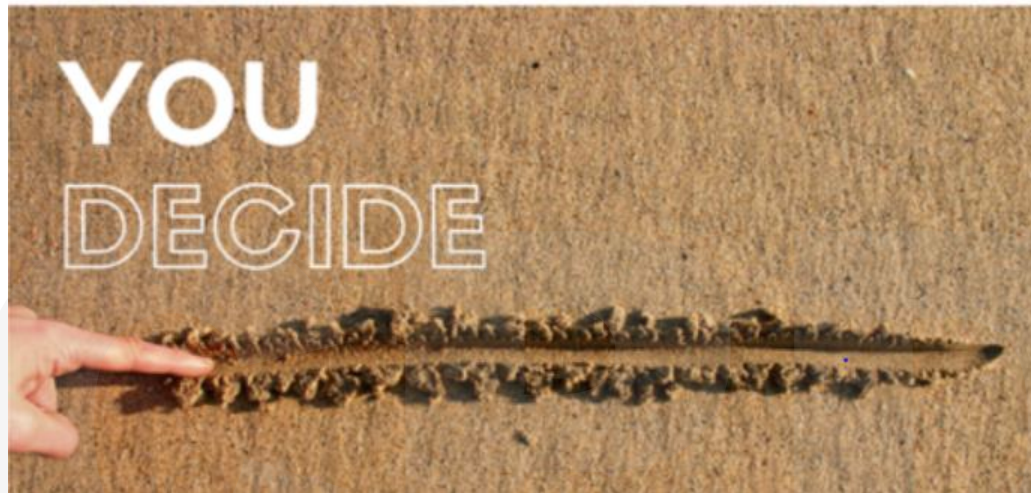
“Among the remedies which it has pleased Almighty God to give to man to relieve his sufferings, none is so universal and so efficacious as opium.”

—*Sir Thomas Sydenham, 1680*



# CDC 2022 Guidelines

“Removing the Line in the Sand”



# Why do we taper opioids?

CDC guidelines are 50% of why we taper

The second most prevalent reason was patient misuse at 32%.

Patient request and insurance is 29%

# Oregon Opioid Taper Guidelines

January 2020

## >> Oregon Opioid Tapering Guidelines

Recommendations for individualized care to  
reduce harm from **opioid use**

# Opioid Trends

- We used to do long-acting opioids
- Now only short-acting and limited
- Moving towards buprenorphine not just for medication-assisted treatment but pain in general.

# Cannabinoids

- Cannabinoid receptors
- Two cannabinoid receptors
- CB<sub>1</sub> - identified in 1988
- Located in central nervous system and peripheral nerves
- Activation produces classic marijuana-like effects on psyche and circulation
  
- CB<sub>2</sub> - identified in 1993
- Located on B lymphocytes and natural killer cells
- Possible role in immunity

# Low Dose Naltrexone

Naltrexone has been  
FDA approved since  
1984

Opiate antagonist

Used in treatment of  
opiod misuse and  
alcohol use

A standard dose was  
between 50-300  
mg/day

Typically, naltrexone  
is free of side effects

At 4.5 mg per day  
(taken before bed)  
we avoid substantial  
blockade of anything  
by mu receptors.

# Low Dose Naltrexone

Chronic pain is thought to be an abnormal inflammatory immune response

This paradoxical effect has not been seen with higher dosages (50mg)

Adaptive increase in endorphins and enkephalins

Increase in endorphins normalizes immune response

We think that it is a balance of mu and delta opioid receptor stimulation that affect immune systems

Just blocking mu can help restore some balance to delta

- 1984
- 50-300 mg/day
- 4.5 mg/day
- 2.5 mg/day



LOW DOSE  
NALTREXONE

Mu

Delta

OHSU



CPD

# What do we treat a lot?

- Arthritis
- Spondylosis
- Spinal stenosis
- Facet arthropathy
- Osteoarthritis
- Facet degeneration



# Types of Musculoskeletal Procedures

Rhizotomy

Radiofrequency lesioning

Ablation

Thermal Ablation

Coolief

Standard radiofrequency

Denervation

# Standard Radiofrequency (Heat-generated “radio” waves)

**1950s**

Electrical currents used in medicine to create predictable thermal lesions.

**Today**

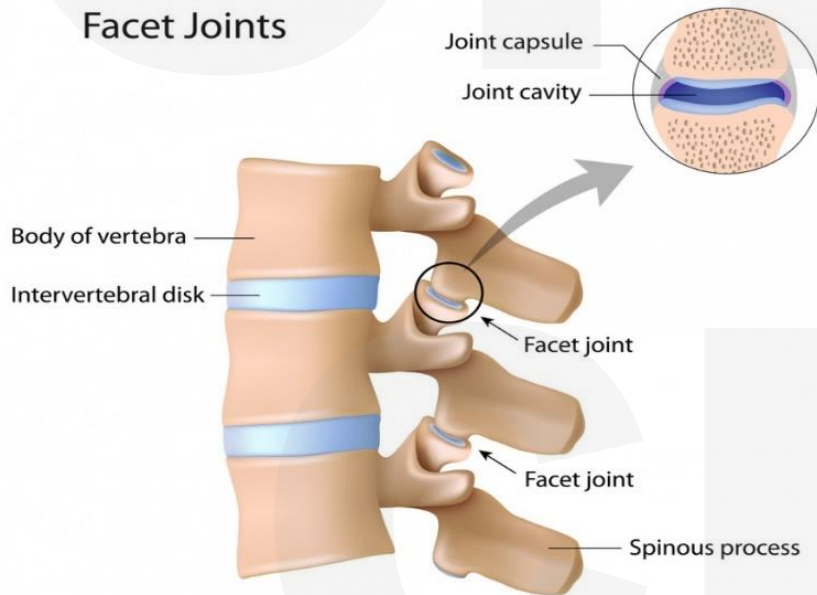
We can predictably destroy tissue targeted around our nerves- i.e. “burn” the nerve tissue

Started using radiofrequency for pain

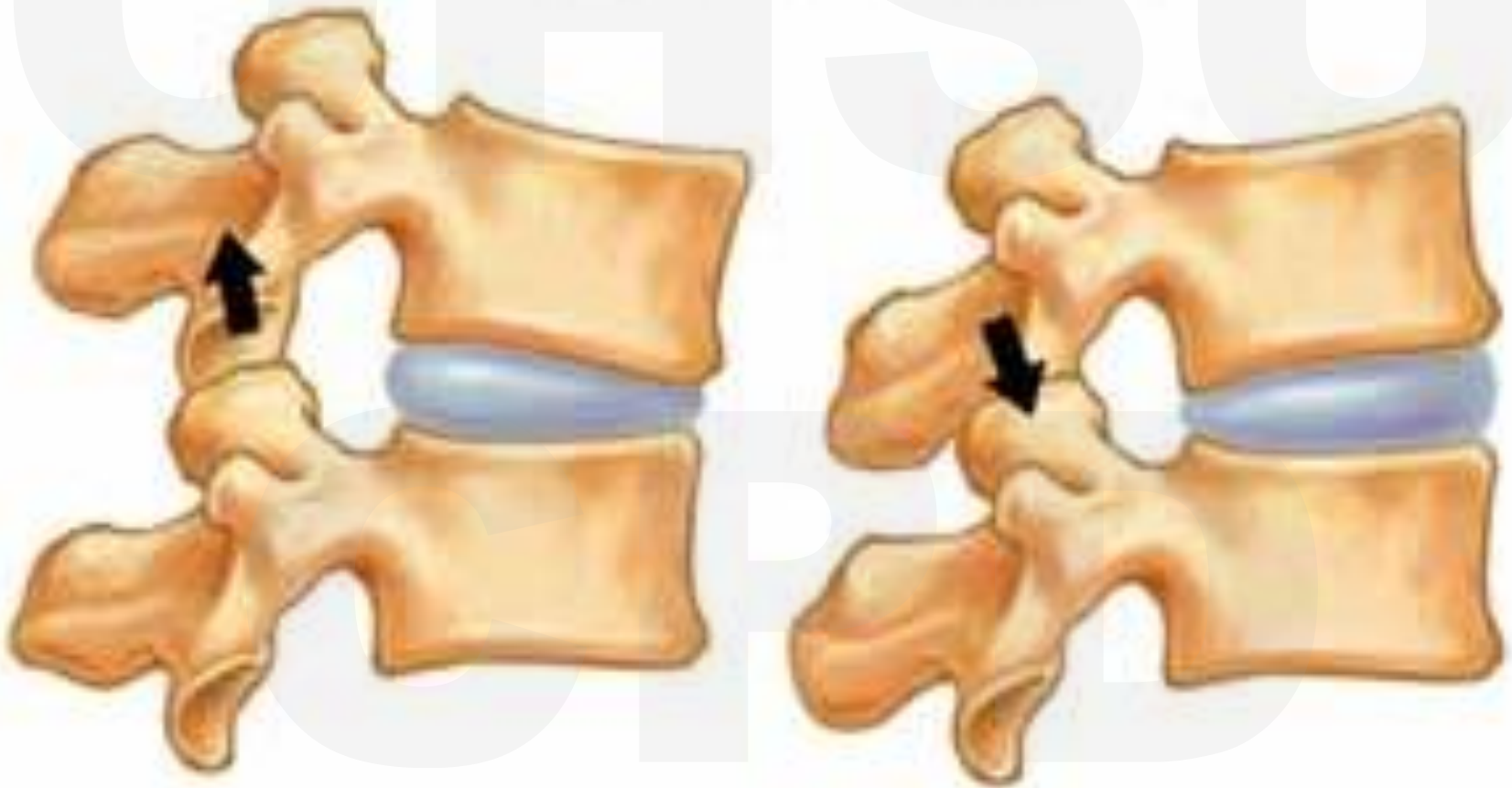
**1970s**

# The Facet Joints

- They have synovial fluid and a fibrous capsule.
- Their innervation is the medial branch .



# Facet Joint Motion

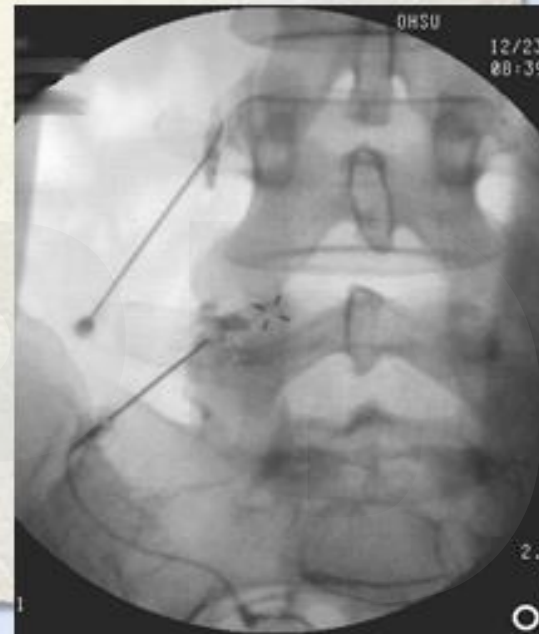


# The Facet Joint

## Facet Joint

- A common source of axial pain
- Possibly more likely if pain ↑s with extension
- Studies of denervation show positive results in cervical and lumbar area
- Medial branch vs facet joint injection

Dreyfuss P et al. *Spine* 2002; Sapir DA et al. *Spine* 2001; Lord S et al. *NEJM* 1996



# Radiofrequency Facet Denervation for Axial Spinal Pain

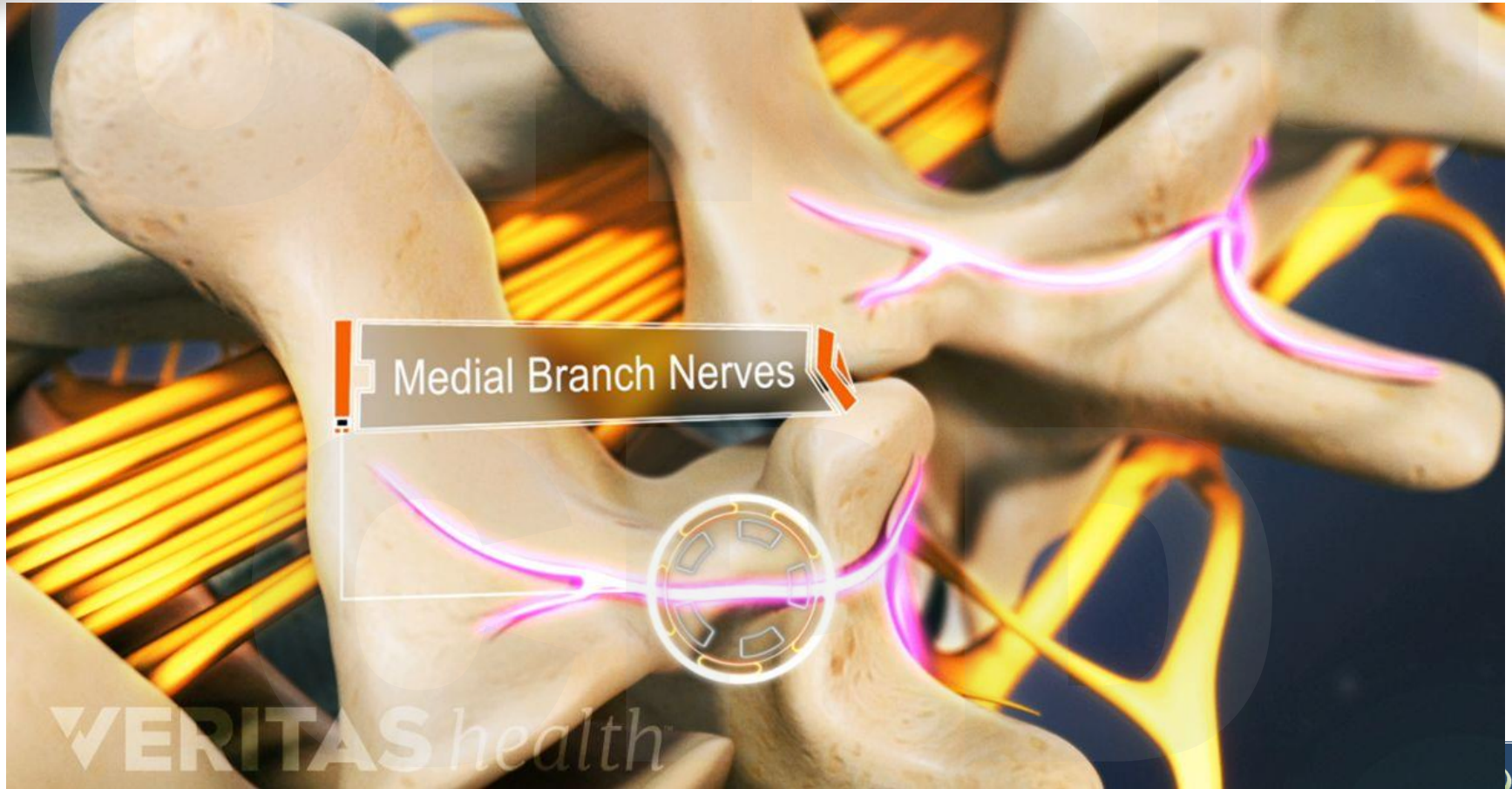


Cervical Medial Branch  
Denervation

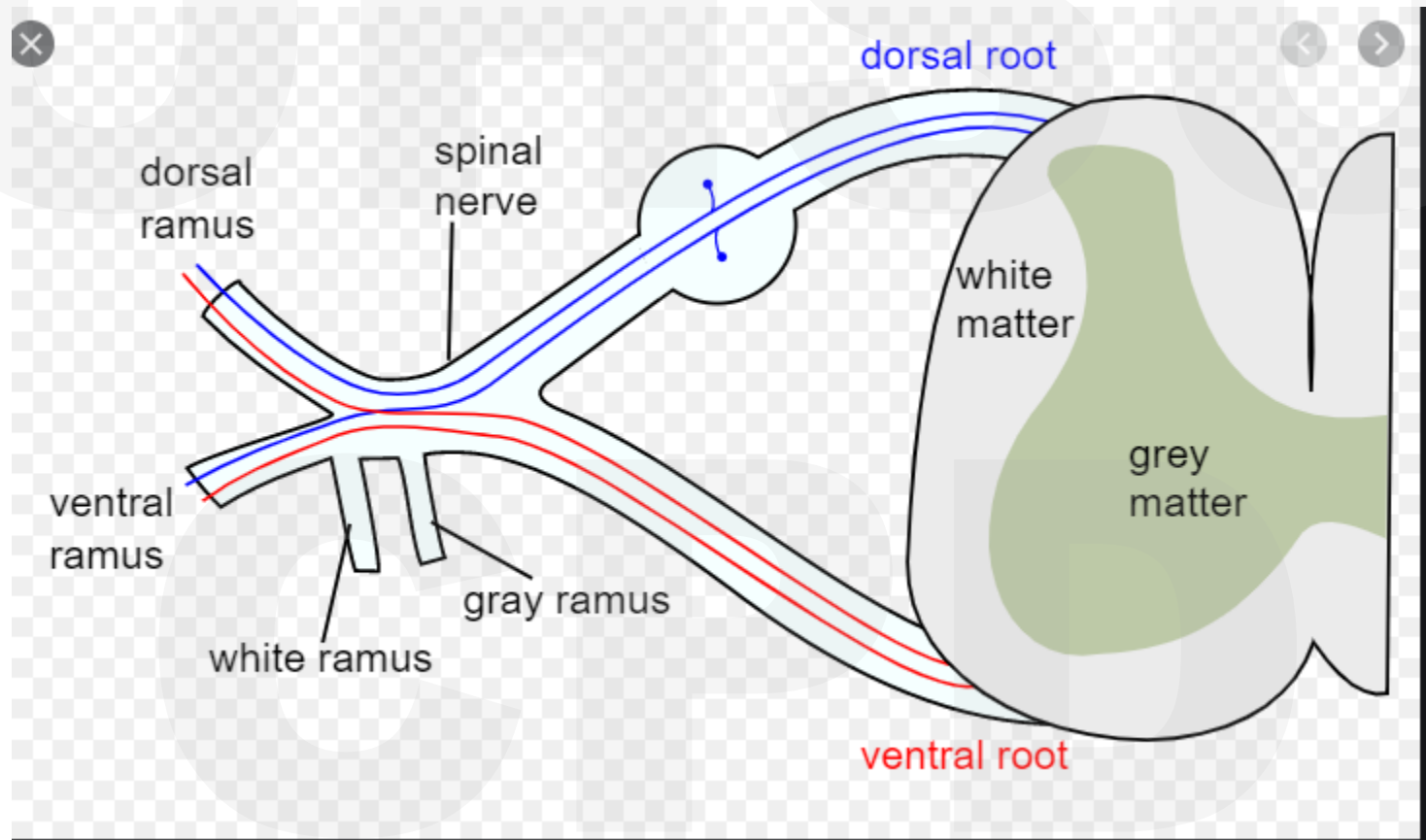


Lumbar Medial Branch  
Blocks

# The Medial Branch Anatomy



# An Anatomy Review



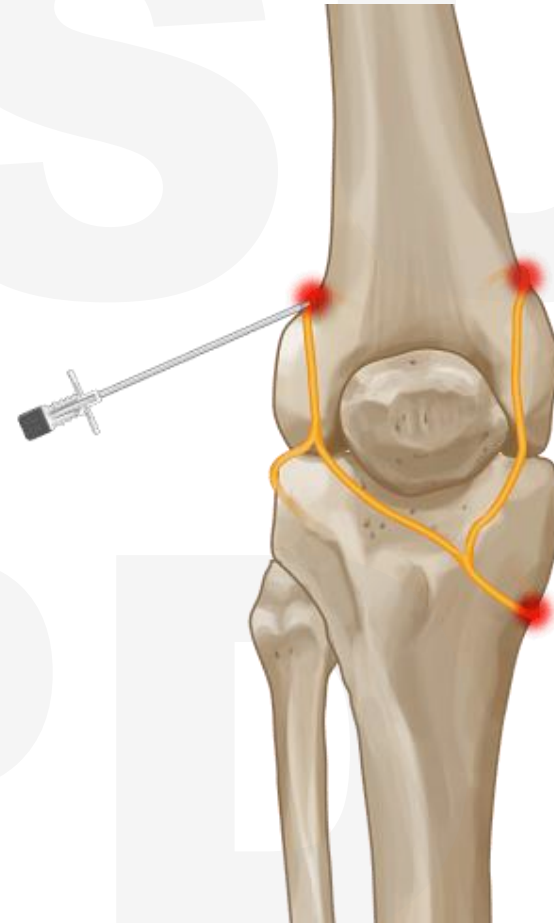
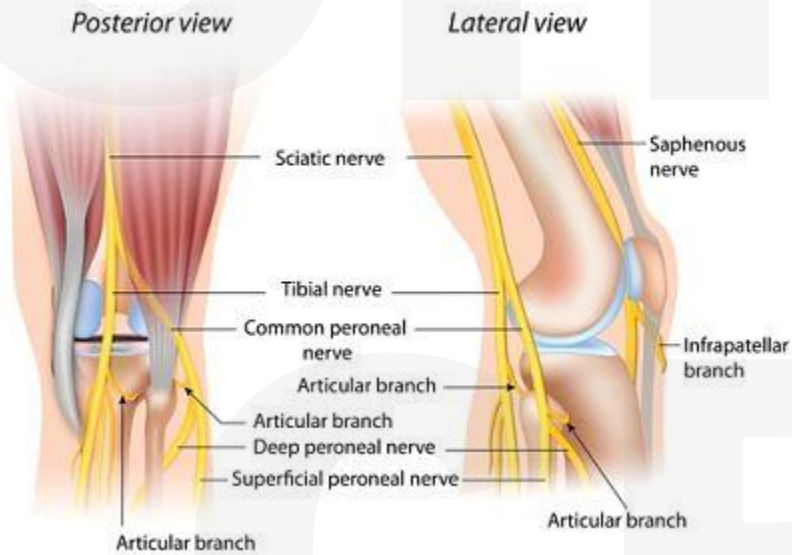
# Knee Anatomy

The knee is innervated by the articular branches of various nerves, including the femoral, common peroneal, saphenous, tibial and obturator.



We call these articular branches genicular nerves.

# Knee Anatomy Imaging



# Knee Anatomy

Genicular nerve blocks can be performed under fluoroscopic or ultrasound guidance

Nerves are targeted adjacent to the periosteum on the medial aspect of the tibia

Nerves also targeted, medial and lateral aspects of femur at junction of shaft and epicondyle

# Coolief: What is It?



# Suggested advantages of Coolief



LARGE VOLUME, SPHERICALLY SHAPED LESIONS.



THE POSSIBILITY OF PERPENDICULAR, OBLIQUE OR PARALLEL APPROACHES TOWARD THE TARGET STRUCTURE.



INCREASED PROBABILITY THAT TARGET NERVES WITH KNOWN NERVE PATH COMPLEXITY AND VARIABILITY WILL BE SUCCESSFULLY CAPTURED AND ABLATED.

# Coolief Technology



Elliptically-shaped lesions immediately adjacent to the active tip

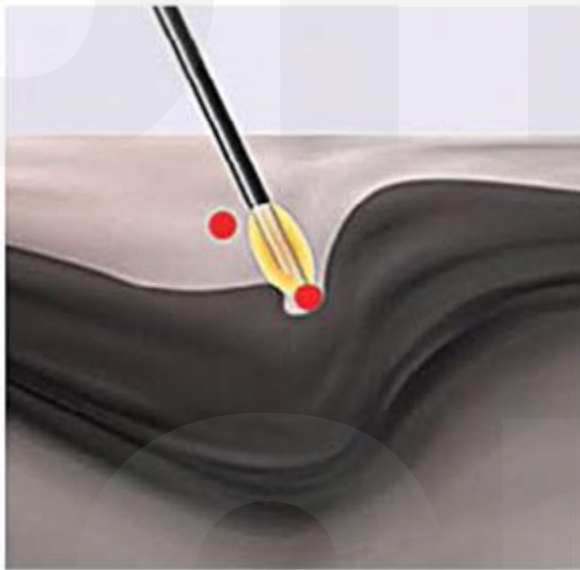


Transmit a current of radiofrequency energy through the electrode.

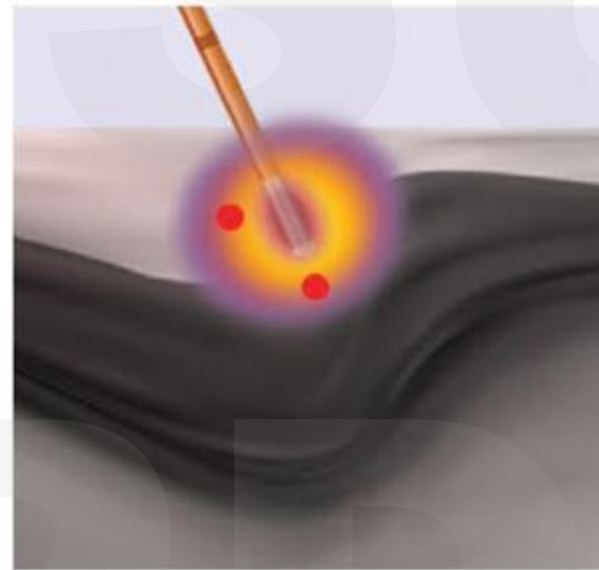


With a water-cooled electrode, you can transmit greater radiofrequency energy.

# Compliments of Coolief

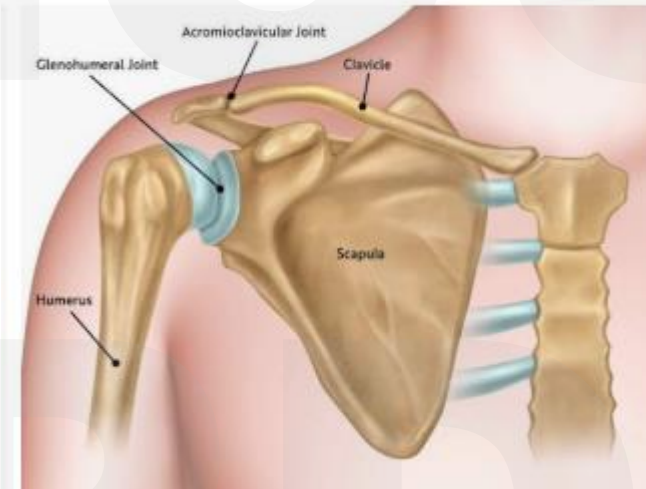


Standard RF



Cooled RF

# Coolief- What Else?



# Myofascial Pain vs. Fibromyalgia vs. Myofascial Pain Syndrome

- Myofascial pain
- Fibromyalgia-**DX is ONLY HPI**
- Myofascial Pain Syndrome
- Dystonia- **NEW CRITERIA**



# Minimally Invasive Lumbar Decompression (MILD)



- Minimally Invasive Lumbar Decompression
- “Mild” removes excess ligament tissue to restore space in the spinal canal.

# Minimally Invasive Lumbar Decompression (MILD)

- The MILD procedure for lumbar spinal stenosis helps open the spinal canal to relieve pressure on the spinal cord or other nerves. The procedure is also referred to as percutaneous image-guided lumbar decompression (PILD).



# ”Vertiflex”

- Vertiflex stands for a specialized approach to treating spinal stenosis using the Superior® Indirect Decompression System.



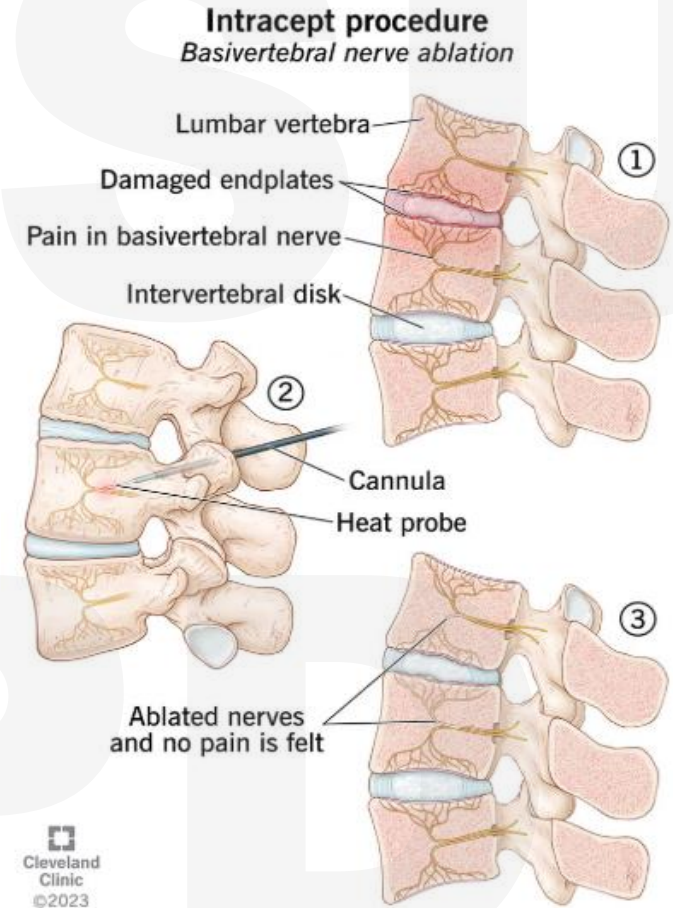
# “Vertiflex”

The implant works by spreading the compressed vertebrae apart and holding them in the proper position. Because the Vertiflex procedure restores the space between the vertebrae and where the nerves exit the spine, the pressure on the spinal cord and surrounding nerves can be relieved.



# Basivertebral Nerve Ablation “Intracept”

- It is treated by basivertebral nerve ablation minimally invasive procedure that uses heat to disable the nerves causing the pain.
- Basivertebral nerve (BVN) ablation is a minimally invasive spinal procedure targeting the BVN, which is responsible for carrying nociceptive information from damaged vertebral endplates, an entity recently postulated as a source of chronic axial low back pain (LBP).
- Intracept procedure, uses radiofrequency energy to destroy this nerve to treat chronic, vertebrogenic lower back pain.



# Gabapentin Misuse

POLITICS

STAT+

## FDA officials warn about the 'next wave' of drug abuse: opioid substitutes



By [Lev Facher](#) May 30, 2018

[Reprints](#)

Evidence emerging for gabapentenooids as a primary agent of abuse  
Evolving area of new literature



Evey, KE, et al. "Abuse and misuse of pregabalin and gabapentin: a systematic review update" *Drugs* 91.1 (2021): 125-156.

# What Should I do with Pregabalin?



Photo taken from Getty Images

# Risk Factors

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The gabapentinoids pregabalin and gabapentin have a potential for being abused and misused, which could result in substance dependence and intoxications.

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Individuals with a history of psychiatric disorders or substance use disorder seem to be at high risk for misuse and abuse.

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Some evidence suggests that patients with opioid use disorders may be at an increased risk of abusing gabapentinoids.

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Available evidence suggests that abuse and misuse are more frequent in users of pregabalin compared with gabapentin.

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# What am I doing?

I am no longer writing very high doses of gabapentin

Top doses of 600 mg three times per day, especially if risk factors

For pregabalin, using the maximum dosing more often than the equivalent high dose of gabapentin

# What am I doing?

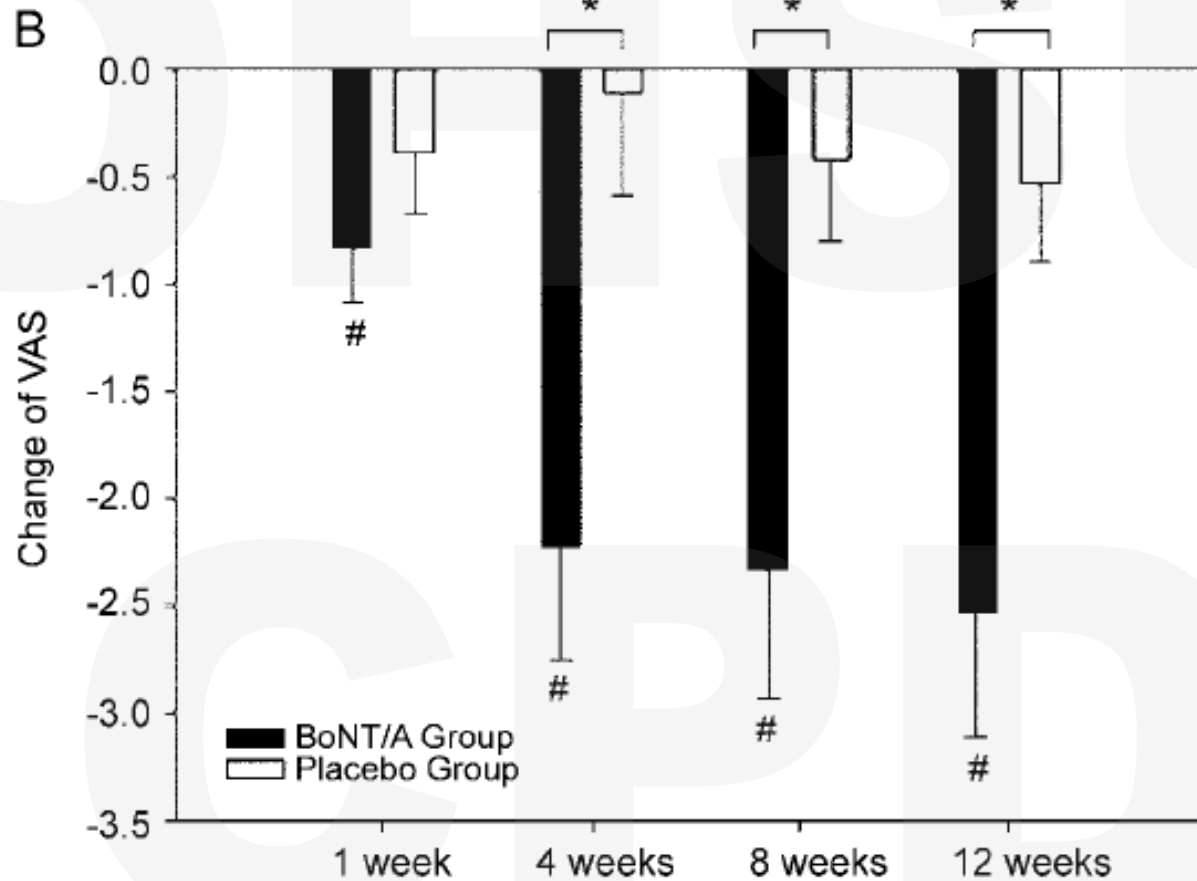
Adding in memantine

5 mg or 10 mg daily

Sometimes 5 mg twice daily

An oral NMDA antagonist

# Botulinum toxin DPN



Yuan R-Y, et al. Botulinum toxin for diabetic neuropathic pain: A randomized double-blind crossover trial. *Neurology* 2009;72:1473–1478

# Suzetrigine (Journavx)

- “Jur na vix”
- VX-548
- Targets Nav 1.9
- Indicated moderate to severe acute pain
- They are using the definition of acute pain as less than 3 months.

# Suzetrigine (Journavx)



Oral medication for moderate to severe acute pain in adults



Administered every 12 hours



Inhibitor of Nav1.8 (see next slide)



FDA approved on January 30th, 2025 (“Journavx®”)

# Voltage Gated Na Channels

We call  
these Nav

There are 9  
varieties

Nav 1.1 to  
Nav 1.9

Nav 1.8 is  
completely in  
the periphery

Why do we  
like that?

# Suzetrigine (Journavx)

2 Phase III Clinical Trials

Trials included over 2000 adults.

Acute pain from tummy tuck or bunion removal.

The efficacy and safety of tested against a placebo and a combination of hydrocodone

Received either JOURNAVX, placebo, or hydrocodone/acetaminophen for 48 hours following surgery.

# What are we seeing?

So far not much  
benefit

Statistically  
significant but  
not that clinically  
significant

# Suzetrigine Harms from Phase III Trials

Well tolerated •

Side effects similar to placebo •

Lower incidence of nausea and vomiting compared with hydrocodone/APAP

# Cost Comparison

| Costs   | Value    | Source                       |
|---|----------|------------------------------|
| <b>Suzetrigine, 7-day prescription (Journavx®)</b>        | \$232.50 | Vertex, Authors' calculation |
| <b>HB/APAP, 7-day prescription (Multiple Brand Names)</b> | \$10.64  | US Redbook                   |

HB/APAP: hydrocodone bitartrate/acetaminophen, US: United States

# Thank You!



[MAUER@OHSU.EDU](mailto:MAUER@OHSU.EDU)



503-720-1100