

Selection Criteria for Peripheral Nerve Stimulation

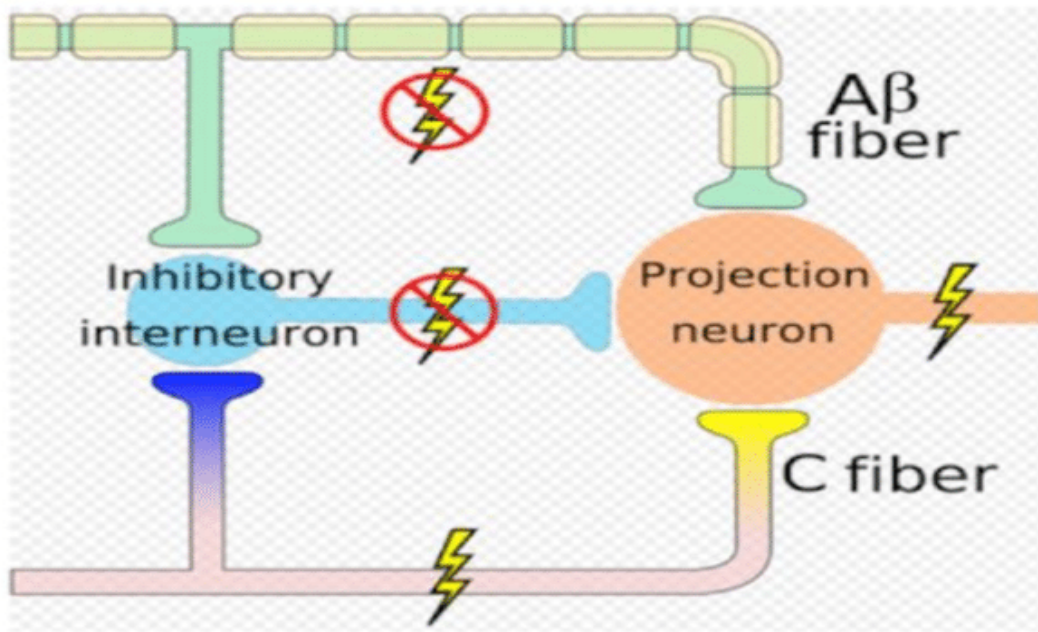
Allen Dennis MD MS DABA DABIPP

DISCLOSURES

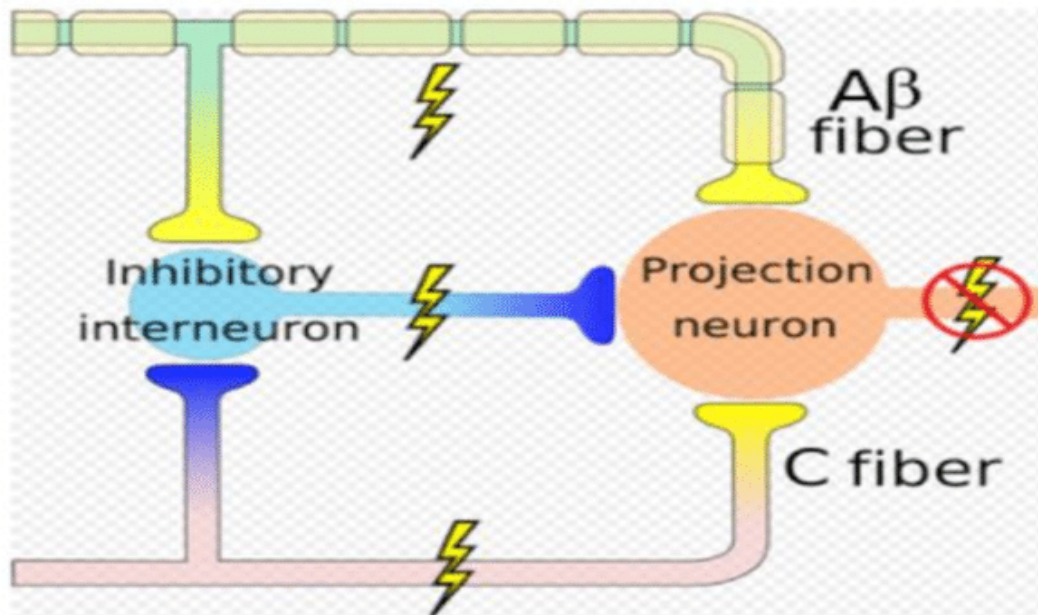
- Consultant for Abbott Medical
- Minority owner of Advanced Pain Care

SUMMARY

- Mechanism Neural Stimulation
- Indication for Peripheral Nerve Stimulation
- Contraindications
- Common Painful Conditions Responsive to PNS
 - Occipital Neuralgia/Trigeminal Neuralgia/Headaches
 - Chronic Shoulder Pain
 - CRPS
 - Chronic Knee Pain
 - Ilioinguinal/Genital Femoral Neuralgia
 - Phantom Limb Pain



A

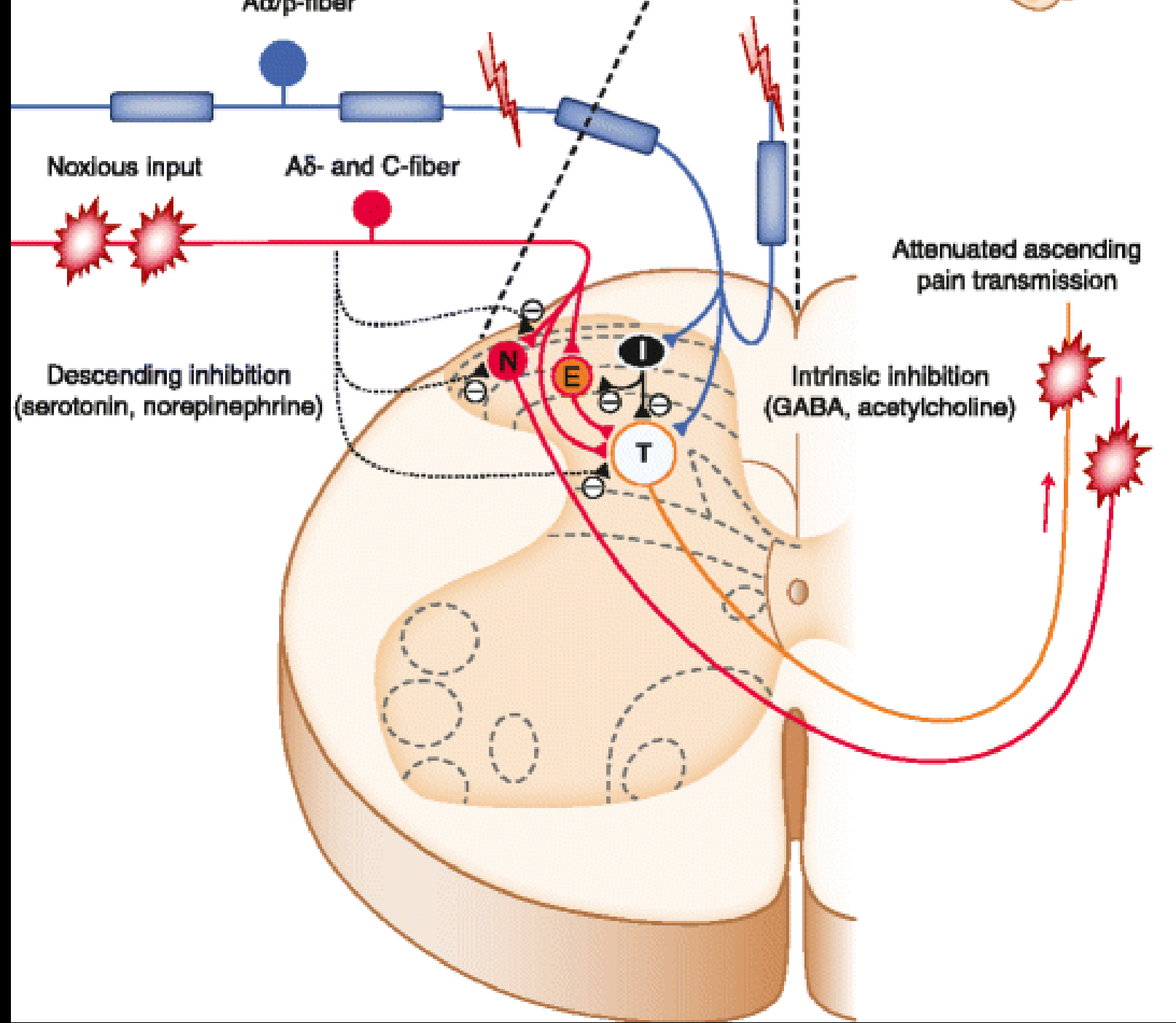


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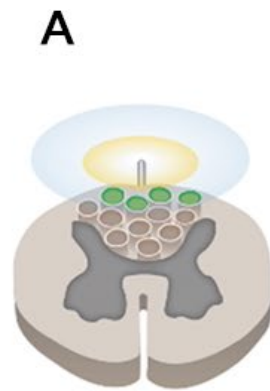
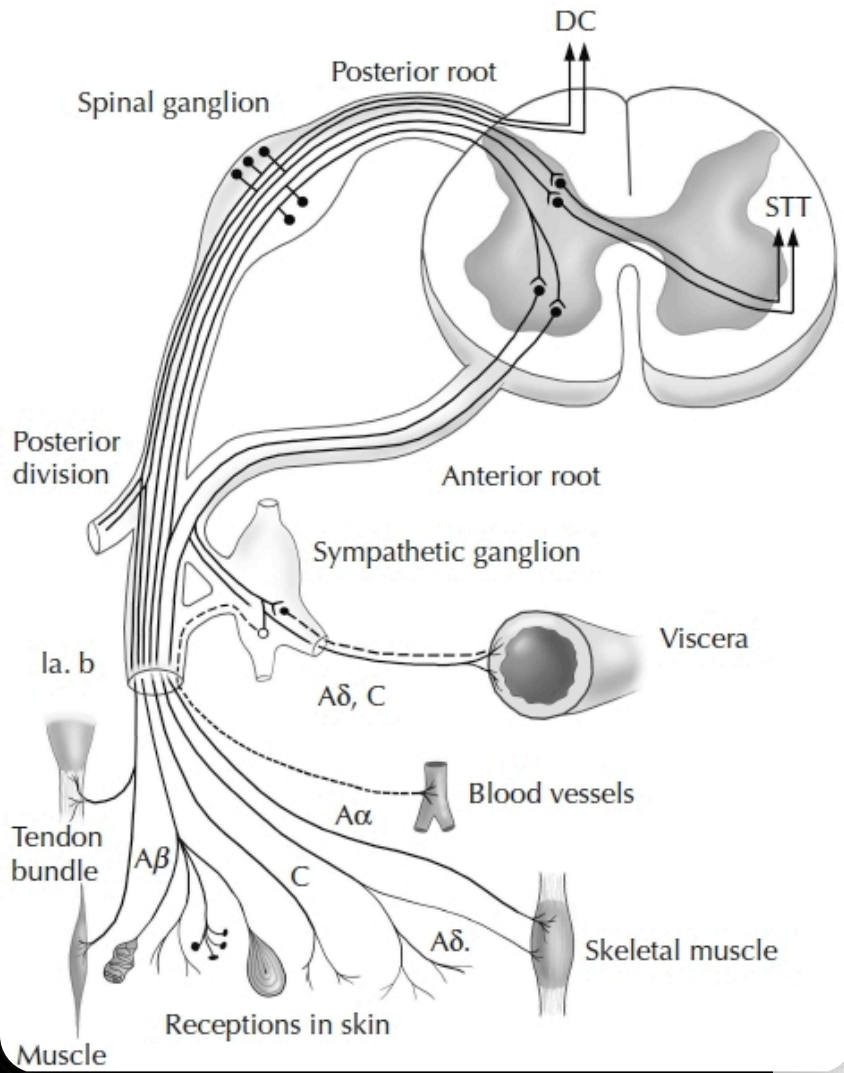
MECHANISM OF ACTION

Gate Control Theory

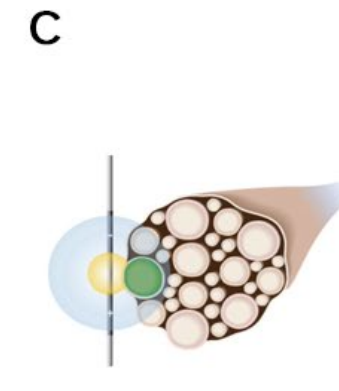
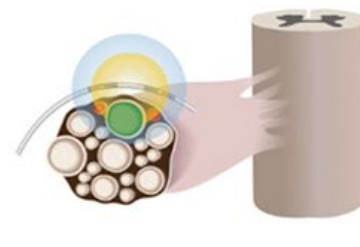
Stimulation of large A-beta fibers inhibit transmission of nociception from A-delta and C fibers



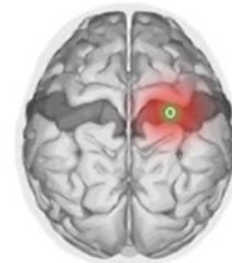
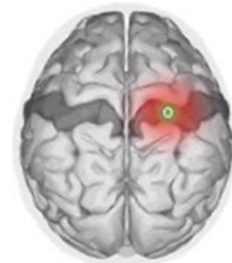
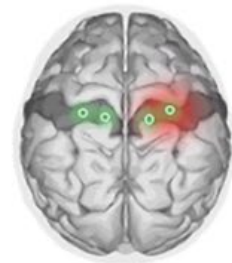
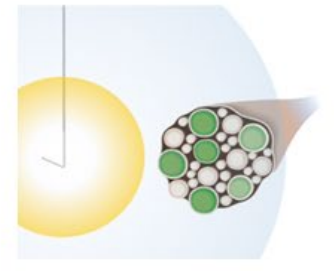
WHERE TO STIMULATE?



● Sensory fiber



● Cortical pain signal



INDICATIONS

ABSOLUTE INCLUSION CRITERIA

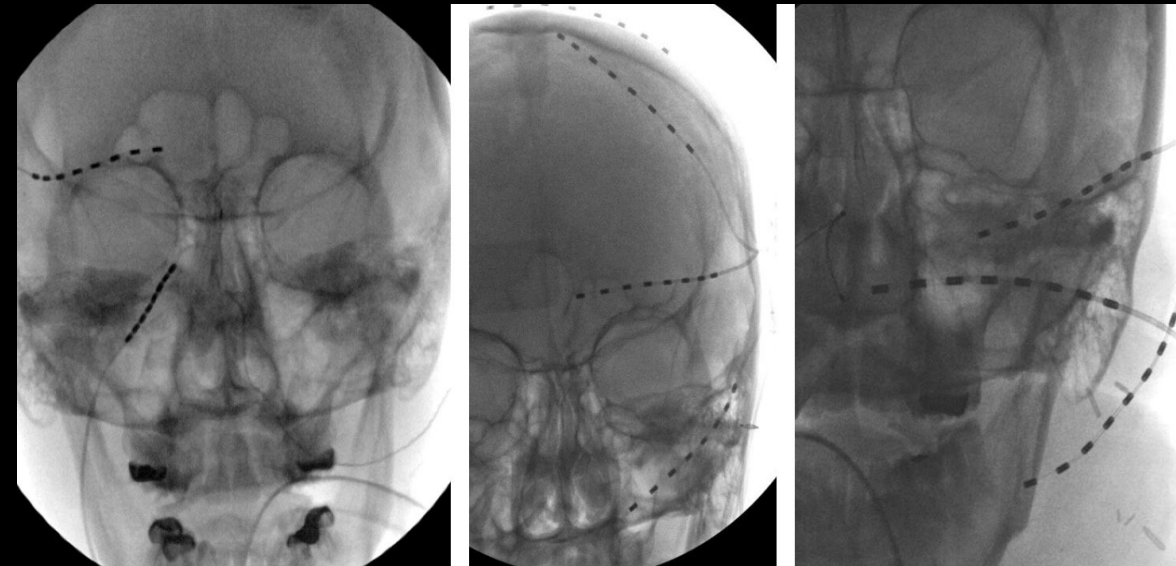
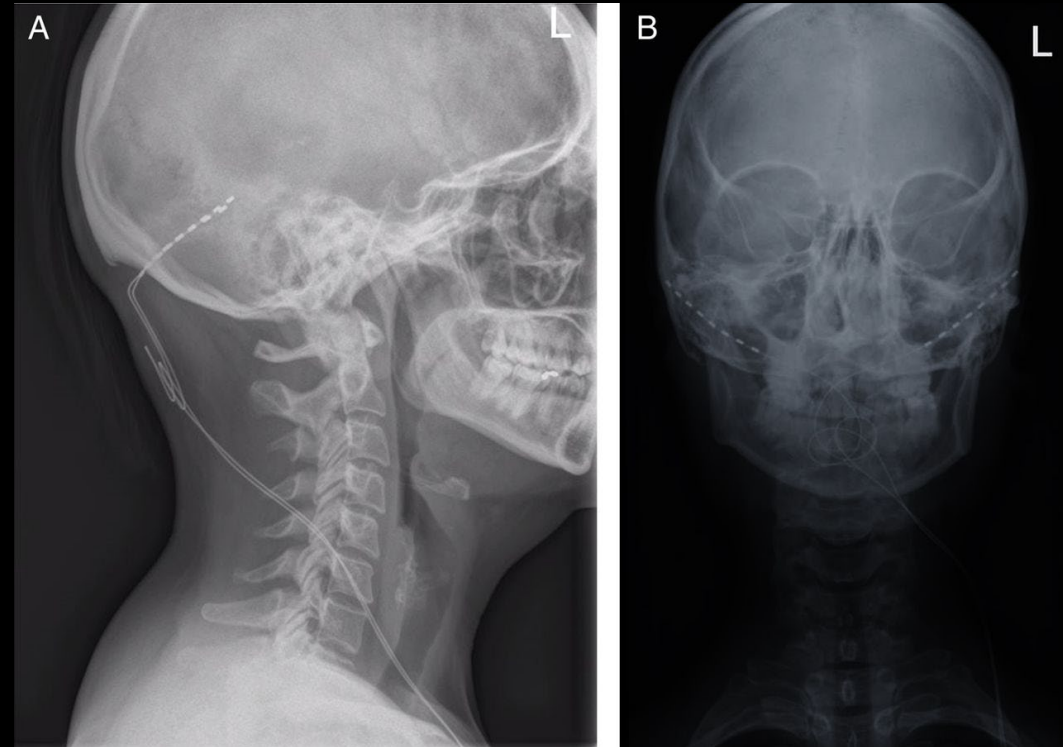
- Chronic pain lasting more than 3 months
- Documented failure of less invasive treatment options (medications, nerve blocks)
- Absence of surgical contraindications (comorbidities, infection)

RELATIVE INCLUSION CRITERIA

- No possible corrective surgical options
- Anatomy/Pain Pathology not conducive for Dorsal Column or Dorsal Root Stimulation

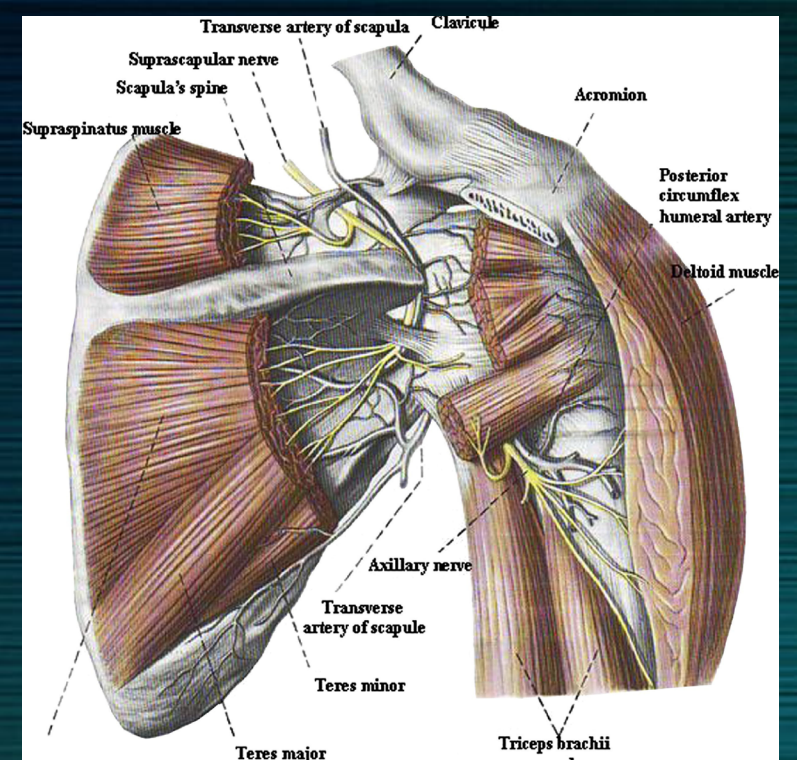
CRANIAL FACIAL PAIN

- OCCIPITAL PNS
 - Level III evidence with most observational studies showing most patients with >50% relief
- TRIGEMINAL PNS
 - Level III evidence with most observational studies showing most patients with >50% relief
- PNS FOR MIGRAINE
 - Level II evidence
 - Multiple Double-blinding RCT



SHOULDER PAIN

- Level II evidence
- Wilson et al Prospective RCT of 25 patients
 - Avg pain reduction from 7.5 to 3.2
- Oswald Prospective Study of 42 implants
 - 78% of patients noted significant improvement
 - Avg 71% reduction in pain scores
 - 72% improvement in activity
- Oswald J, Shahi V, Chakravarthy KV. Prospective case series on the use of peripheral nerve stimulation for focal mononeuropathy treatment. *Pain Manag.* 2019
- Deer TR, Naidu R, Strand N, et al. A review of the bioelectronic implications of stimulation of the peripheral nervous system for chronic pain conditions. *Bioelectron Med.* 2020;6:9. Published 2020 Apr 24. doi:10.1186/s42234-020-00045-5



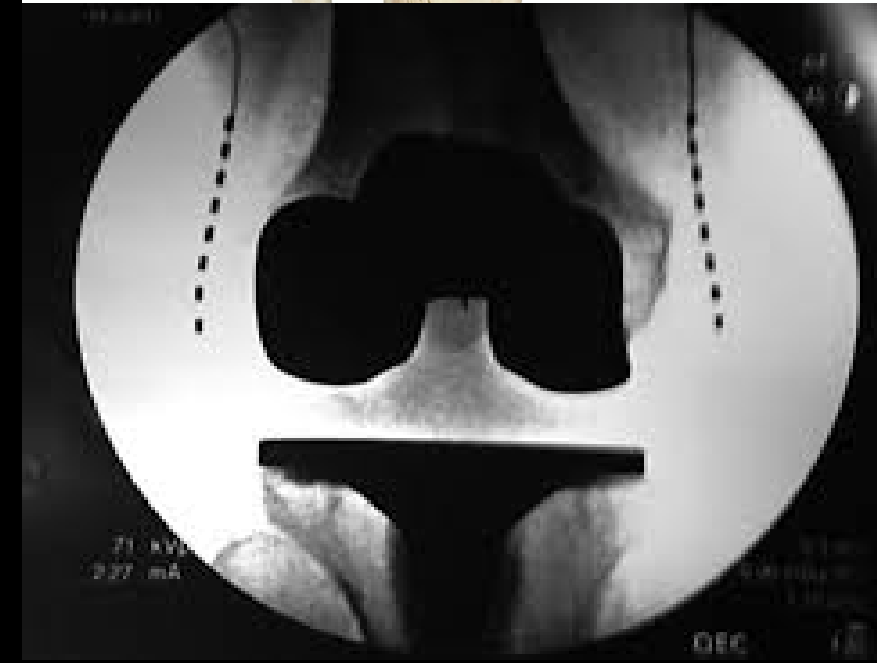
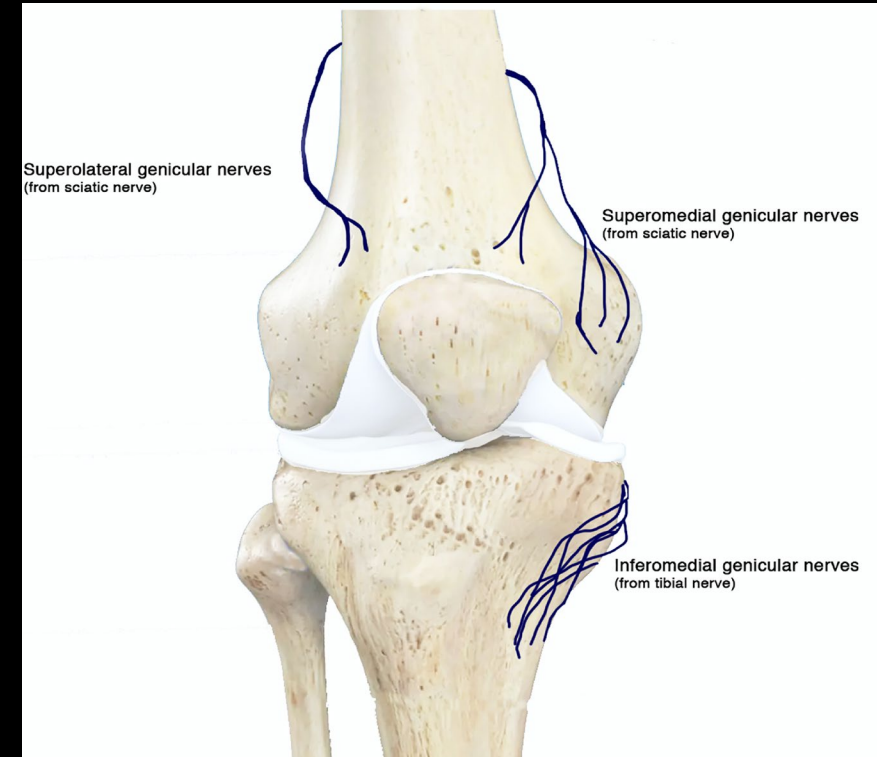
CRPS I/II

- Prospective study of 15 patients with CRPS.
 - 12 proceeded to implant after trial
 - Average NRS reduction for 8.56 prior to implant to 3.56 at 9 months post implant
- Reverberi C, Dario A, Barolat G, Zuccon G. Using peripheral nerve stimulation (PNS) to treat neuropathic pain: a clinical series. *Neuromodulation*. 2014;17(8):777–783.



KNEE PAIN

- Observation case studies with promising results
- Controlled studies needed
- Kaye AD, Ridgell S, Alpaugh ES, et al. Peripheral Nerve Stimulation: A Review of Techniques and Clinical Efficacy. *Pain Ther.* 2021;10(2):961-972



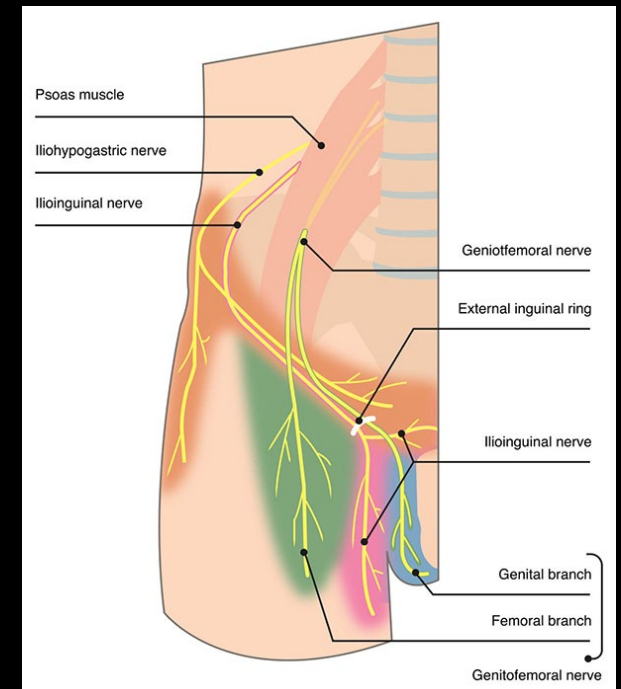
ILIOINGUINAL/GENITALFEMORAL NEURALGIA

- Shaw et al reported a case series of 6 patients with post surgical pelvic wall pain
 - All six patients reported pain relief with an average 62% reduction in pain scores
- Shaw A, Sharma M, Zibly Z, Ikeda D, Deogaonkar M. Sandwich technique, peripheral nerve stimulation, peripheral field stimulation and hybrid stimulation for inguinal region and genital pain. *Br J Neurosurg.* 2016;30(6):631–636.



C32767
W85535
Not for diagnostic use

GE HEALTHCARE



POSTAMPUTATION PAIN

- Multicenter RCT
 - 28 patients with peripheral nerve stimulation for 60 days or placebo with cross over
 - 68% reported >50% relief in treatment arm compared with 14% in placebo
 - Results held at 12 months after completion of 60 day stimulation
 - Gilmore CA, Ilfeld BM, Rosenow JM, Li S, Desai MJ, Hunter CW, Rauck RL, Nader A, Mak J, Cohen SP, Crosby ND, Boggs JW. Percutaneous 60-day peripheral nerve stimulation implant provides sustained relief of chronic pain following amputation: 12-month follow-up of a randomized, double-blind, placebo-controlled trial. Reg Anesth Pain Med. 2019 Nov 17:rapm-2019-100937.

THANK YOU