

Advanced Pain Management Institute

7309 N. Knoxville Ave
Peoria, IL 61614

Demaceo Howard, M.D., DABPM, FIPP, Medical Director

Keith Barnhill, Ph.D., CRNA, DAAPM

What is Radiofrequency Neurotomy?

Radiofrequency neurotomy is a procedure frequently used for the management of pain. There are two types of therapies available. The difference between the two is temperature. Pulsed (normothermic) radiofrequency involves the treatment of injured nerves with a current which does not exceed normal body temperature. Heated radiofrequency treatment uses temperature far above normal body temperature to lesion nerves to stop the transmission of pain signals.

Heated radiofrequency (RF) neurotomy is an office out-patient procedure performed with or without the use of sedation. Even without the sedation the procedure is not painful with the use of local anesthesia. The most common pathology treated with radiofrequency today is spinal facet arthropathy. Facet arthropathy pain is frequently a cause of non-radicular back and neck pain. Because pain may be referred from facet structures, patients may experience symptoms from headache to hip and thigh pain dependent on the spinal level of pathology.

After a series of diagnostic local anesthetic blocks to the facet nerves, a patient is considered a candidate for RF if 50% or more pain relief is experienced.

The RF procedure is very similar to the diagnostic procedure except the local anesthetic blocks to nerves are followed by heat treatment to nerves at 80-90 degrees centigrade for a few minutes. Since the lesion site has been anesthetized there is usually no discomfort experienced during this part of the procedure.

Several studies have addressed the use of RF in the treatment of facet arthropathy. Manchikanti et al. (1) concluded that there was strong evidence for short-term relief and moderate evidence for long term relief of facet joint pain. Lord et al. (2) evaluated radiofrequency neurotomy in patients with cervical facet arthropathy and found the median duration for 50% pain relief to be 263 days vs. 8 days for the control group. Van Kleef et al(3) have also noted efficacy using RF to treat lumbar facet arthropathy. The use of multiple diagnostic local anesthetic blocks prior to the RF procedure is common to

studies which demonstrate efficacy with this procedure.

Pulsed radiofrequency (pRF), although similar in name to RF is very distinct in its mechanism of pain relief than RF. The current used in pRF is applied in short bursts or pulses and the time between pulses allows for surrounding tissues to cool. The electrode tip does not exceed 42 degrees centigrade. Because of this, pRF is believed to regulate pain not through lesioning but by reducing the neuro-inflammatory response seen in many pain states.

Frequently in nerve injury, the cellular response which perpetuates pain lies in the dorsal root ganglion (Melzack and Wall, *Textbook of Pain*(4)). Both neurochemical and inflammatory mediators produce changes in the dorsal root ganglion. This leads to a chronic neuropathic pain state. The down regulation of this response is believed to be the action of pRF therapy.

Pain disorders treated with pRF include:

Trigeminal Neuralgia
Spinal radiculopathies
Post-thoracotomy pain
Sacroiliac dysfunction
Complex regional pain syndrome (CRPS) or RSD
Shingles
Peripheral neuropathies

References:

1. Manchikanti L, Singh V, Vilims B, Hansen HC, Schultz DM, Kloth DS. Medial branch neurotomy in the management chronic spinal pain: Systematic review of evidence. *Pain Physician* 2002; 5:405-418.
2. Lord SM, Barnsley L, Wallis BJ, McDonald GJ, Bogduk N. Percutaneous radiofrequency neurotomy for chronic cervical zygapophyseal joint pain. *N England J Med* 1996; 335: 1721-1726.
3. Van Kleef M, Barendse GA, Kessels A, Voets HM, Weber WE, de lange S. Randomized trial of radiofrequency lumbar facet de-nerivation for chronic low back pain. *Spine* 1999; 24: 1937-1942
4. Melzack R., and Wall P.D., *Textbook of Pain* p904-1074