Medical Policy Reference Manual
Medical Policy

2.01.067 Pulsed Radiofrequency Therapy for Chronic Pain

Original MPC Approval: 11/14/2012
Last Review: 06/01/2021
Last Revision: 06/01/2021

Description

Radiofrequency thermal energy is used in many surgical settings for ablation of tissue. The radiowave-induced heat can be used to create lesions in sensory nerves to relieve chronic pain by interrupting the path of transmission of the pain signal to the brain. This radiofrequency ablation (RFA) of nerve fibers has been used for a variety of chronic painful syndromes including whiplash injury, intercostal neuralgia, sacroiliac syndrome, trigeminal neuralgia, and others. Pulsed RF thermal treatment (PRF) is being proposed as a nonablative alternative to RFA. Whereas the RFA probe delivers energy continuously for 40 to 90 seconds with an electrode temperature of 60°C to 90°C, the PRF delivers short bursts of current with a probe not exceeding 42°C. The pulsed energy allows the tissue to cool between bursts. PRF therefore is actually nonablative; the reduced temperature does not destroy the target nerve or neighboring tissue. The mechanism of action is not well understood, but it is believed the electrical field disrupts the transmission of nerve impulses without tissue destruction.

Policy

The use of pulsed radiofrequency energy therapy in the treatment of chronic painful conditions is considered **experimental / investigational** as it does not meet TEC criteria #2-5.

Policy Guidelines

Rationale:

1. The technology must have final approval from the appropriate U.S. government regulatory bodies:

There have been numerous radiofrequency energy delivery devices cleared under the 510(k) process.

2. The scientific evidence must permit conclusions concerning the effect on health outcomes:

Evidence for PRF is generally regarded as low in quality. The earlier studies evaluating PRF for low back pain were mostly retrospective in nature with small study populations and lack of controls (Mikeladze et al, 2003; Lindner et al, 2006) In the Mikeladze study, 40% of the patients did not achieve at least a 50% reduction in pain. In the Lindner study PRF was successful in 72% of patients who had not had previous surgery but only 26% of those who had prior surgery. A small prospective series by Vallejo et al (2006) concluded that PRF may be effective for some patients with sacroiliac joint pain who were unresponsive to other treatments based on a 72.7% response. The relief was generally of short duration. Three randomized, controlled trials (RCT) were reviewed (Van Zundert et al, 2007; Kroll et al, 2008; Gofeld et al, 2012). These were all small studies, involving 22-50 patients, and using various control methods with short-term follow-up periods. Although the RCT is needed to properly assess pain relief methodologies, the small study size and short follow-up periods hinder the ability to form reliable conclusions

regarding patient outcomes. In comparative studies where the effects of PRF were compared with continuous RFA, the ablative procedure resulted in more complete pain relief with a longer duration (Tekin et al, 2007; Kroll et al, 2008).

3. The technology must improve the net health outcome:

Based on the limited studies, procedural complications appear to be infrequent and transient. Pain, numbness and burning sensations were reported, along with occasional sedation and dizziness. Overall the procedure appears to be safe, with fewer complications than observed with RFA. The evidence however is insufficient to assess the net health outcomes, and because PRF is not a cure but a palliative procedure its role as a pain treatment needs to be defined and patient selection criteria established.

4. The technology must be as effective as any established alternatives:

The continuous radiofrequency thermal procedure is well-established, and supported by a limited body of evidence. Comparison studies have been done on two occasions, the results suggesting that RFA provides improved pain relief and of a longer duration. It has therefore not been established that PRF is as effective as RFA based on very limited evidence.

5. The improvement must be attainable outside the investigational settings:

It has not been established that PRF improves net health outcomes within the investigational setting.

Update 2014:

A search of the peer-reviewed literature was performed from October 2012 through October 2014. Findings in the recent literature do not change the conclusions on pulsed radiofrequency for chronic pain. Therefore, the policy statement is unchanged.

Update 2017:

A search of the peer-reviewed literature was performed from November 2014 through January 2017. Findings in the recent literature do not change the conclusions on pulsed radiofrequency for chronic pain. Therefore, the policy statement is unchanged.

Update 2019:

A search of the peer-reviewed literature was performed from February 2017 through January 2019. Findings in the recent literature do not change the conclusions on pulsed radiofrequency for chronic pain. Therefore, the policy statement is unchanged.

Update 2021:

A search of the peer-reviewed literature was performed from February 2019 through February 2021. Findings in the recent literature do not change the conclusions on pulsed radiofrequency for chronic pain. Therefore, the policy statement is unchanged.

Provider Guidelines

PRF should be reported using an unlisted code until a code more specific to pulsed radiofrequency treatment is developed.

Cross References to Related Policies and Procedures

Peripheral Field Neurostimulation for Chronic Pain Medical Policy 7.01.120

References

The following were among the resources reviewed and considered in developing this policy. By reviewing and considering the resources, CareFirst does not in any way endorse the contents thereof nor assume any liability or responsibility in connection therewith. The opinions and conclusions of the authors of these resources are their own, and may or may not be in agreement with those of CareFirst.

BlueCross BlueShield Association.(2020, October). Ablation of Peripheral Nerves to Treat Pain. Medical Policy 7.01.154. Chicago: Author.

BlueCross BlueShield Association. Facet Joint Denervation. (2013, October; 2015, October; 2020, December). Medical Policy 7.01.116. Chicago: Author.

Boswell, M. V., Manchikanti, L., Kaye, A. D., Baklshi, S., Gharibo, C. G., et al (2015, August). A best-evidence systematic appraisal of the diagnostic accuracy and utility of facet (zygapophysial) joint injections in chronic spinal pain. *Pain Physician.* 18(4):E497-533.

Byrd, D., Mackey, S. (2008). Pulsed Radiofrequency for Chronic Pain. *Current Pain and Headache Reports* 12, 37-41.

Cetin and Yektas (2018) Evaluation of the short- and long-term effectiveness of pulsed radiofrequency and conventional radiofrequency performed for medial branch block in patients with lumbar facet joint pain, *Pain Res Manag,* doi: 10.1155/2018/7922753.

Choi, G.S., Ahn, S.H., Cho, Y.W., Lee, D.K. (2011). Short-Term Effects of Pulsed Radiofrequency on Chronic Refractory Cervical Radicular Pain. *Annals of Rehabilitation Medicine* 35, 826-32.

Colini-Baldeschi, G. (2012, Winter).http://www.ncbi.nlm.nih.gov/pubmed?term=Colini-Baldeschi%20G%5BAuthor%5D&cauthor=true&cauthor_uid=24904787 Evaluation of pulsed radiofrequency denervation in the treatment of chronic facet joint pain: an observational study. *Anesthesiology and Pain Medicine.* 1(3): 168-73 doi: 10.5812/kowsar.22287523.2584

Contreras Lopez, W. O., Navarro, P. A., Vargas, M. D., Alape, E., & Camacho Lopez, P. A. (2019). Pulsed Radiofrequency Versus Continuous Radiofrequency for Facet Joint Low Back Pain: A Systematic Review. *World neurosurgery*, 122, 390–396. https://doi.org/10.1016/j.wneu.2018.10.191

De, M., Mohan, V. K., Bhoi, D., Talawar, P., Kumar, A., Garg, B., Trikha, A., Dehran, M., Kashyap, L., & Shende, D. R. (2020). Transforaminal Epidural Injection of Local Anesthetic and Dorsal Root Ganglion Pulsed Radiofrequency Treatment in Lumbar Radicular Pain: A Randomized, Triple-Blind, Active-Control Trial. *Pain practice : the official journal of World Institute of Pain,* 20(2), 154–167. https://doi.org/10.1111/papr.12840

Gofeld, M., Restrepo-Garces, C.E., Theodore, B.R., Faclier, G. (2012). Pulsed radiofrequency of suprascapular nerve for chronic shoulder pain: A randomized double-blind active placebo-controlled study. *Pain Practice* 2012 May 4.

Guo, L., Kubat, N.J., Nelson, T.R., Isenberg, R.A. (2012). Meta-analysis of clinical efficacy of pulsed radiofrequency energy treatment. *Annals of Surgery* 255, 457-67.

Hansen, H., Manchikanti, L., Simopoulos, T.T. et al (2012). A systematic evaluation of the therapeutic effectiveness of sacroiliac joint interventions. *Pain Physician* 15, E247-78.

Hayes Evidence Analysis Research Brief. Oct 27, 2020. Pulsed Radiofrequency Treatment of Complex Regional Pain Syndrome of the Lumbar Region. Lansdale, PA: Hayes, Inc.

Hayes Health Technology Assessment. (2020, January). Percutaneous Radiofrequency Ablation For Cervical And Thoracic Spinal Indications. Lansdale, PA: Hayes, Inc.

Hayes Health Technology Assessment. (2019. May; 2020, August). Pulsed Radiofrequency Application To The Dorsal Root Ganglion For Treatment Of Cervical Radicular Pain. May 3, 2019. Lansdale, PA: Hayes, Inc.

Hayes Health Technology Assessment. (2019, May; 2020, September). Pulsed Radiofrequency Application To The Dorsal Root Ganglion For Treatment Of Lumbosacral Radicular Pain. May 16, 2019. Lansdale, PA: Hayes, Inc.

Hayes Medical Technology Directory (2007). Radiofrequency Ablation for Cervical and Thoracic Back Pain. March 15, 2007. Lansdale, PA: Hayes, Inc.

Hayes Medical Technology Directory (2007; 2011, July- updated; 2012, April- archived). Radiofrequency Ablation for Chronic Low Back Pain. March 28, 2007. Lansdale, PA: Hayes, Inc.

Hayes Medical Technology Directory (2012, updated 2014). Radiofrequency Ablation for Sacroiliac Joint Pain. August 21, 2012. Lansdale, PA: Hayes, Inc.

Hayes Search & Summary Directory. (2015). Radiofrequency ablation for cervical back pain. October 1, 2015. Lansdale, PA: Hayes, Inc.

Hayes Search & Summary Directory. (2015). Radiofrequency ablation for thoracic back pain. October 8, 2015. Lansdale, PA: Hayes, Inc.

Ke, M., Yinghui, F., Yi, J., Xeuhua, H., Xiaoming, L., Zhijun, C., . . . Yingwei, W. (2013). Efficacy of pulsed radiofrequency in the treatment of thoracic postherpetic neuralgia from the angulus costae: a randomized, double-blinded, controlled trial. *Pain Physician*. 16(1):15-25, 2013 Jan.

Kroll, H.R., Kim, D., Danic, M.J. et al (2008). A randomized, double-blind, prospective study comparing the efficacy of continuous versus pulsed radiofrequency in the treatment of lumbar facet syndrome. *Journal of Clinical Anesthesia* 20, 534-7.

Manchikanti,L., Abdi, S., Atluri, S., Benyamin, R.M., Boswell, M.V., Buenaventurea, R.M., ... Hirsch, J.A. (2013, April). An update of comprehensive evidence-based guidelines for interventional techniques in chronic spinal pain. Part II: guidance and recommendations. *Pain Physician.* 16(2 Suppl):S49-283.

Manolitsis, N., Elahi, F. (2014, December). Pulsed radiofrequency for occipital neuralgia. *Pain Physician.* 17(6):E709-17.

O'Gara, A., Leahy, A., McCrory, C., & Das, B. (2020). Dorsal root ganglion pulsed radiofrequency treatment for chronic cervical radicular pain: a retrospective review of outcomes in fifty-nine cases. *Irish journal of medical science*, 189(1), 299–303. https://doi.org/10.1007/s11845-019-02087-4

Park, J., Lee, Y.J., Kim, E.D. (2019) Clinical effects of pulsed radiofrequency to the thoracic sympathetic ganglion versus the cervical sympathetic chain in patients with upper-extremity complex regional pain syndrome: A retrospective analysis, *Medicine (Baltimore)*, 98(5): e14282.

Shabat, S., Leitner, J., Folman, Y. (2013, July). Pulsed radiofrequency for the suprascapular nerve for patients with chronic headache. *Journal of Neurosurgical Anesthesiology*. 25(3): 340-3 doi: 10.1097/ANA.0b013e3182905e89.

Tak, H.J., Chang, M.C. (2018) Effect of pulsed radiofrequency therapy on chronic refractory atlanto-occipital joint pain, *World Neurosurg*, 119: e638-e642.

Tekin, I., Mirzai, H., Ok, G. et al (2007). A comparison of conventional and pulsed radiofrequency denervation in the treatment of chronic facet joint pain. *Clinical Journal of Pain* 23, 524-9.
UptoDate: Anterior cutaneous nerve entrapment syndrome. Author: Meyer, G.W. Updated: Oct 05, 2020.

UptoDate: Cervicogenic headache. Author: Watson, J.C. Literature review current through Jan 2021. Updated: Dec 28, 2018.

UptoDate: Occipital neuralgia. Author: Garza, I. Updated: Feb 22, 2021

Van Zundert, J., Patijn, J., Kessels, A. et al (2007). Pulsed radiofrequency adjacent to the cervical dorsal root ganglion in chronic cervical radicular pain: a double blind sham controlled randomized clinical trial. *Pain*127, 173-82.

Vanneste, T., Van Lantschoot, A., Van Boxem, K., Van Zundert, J. (2017) Pulsed radiofrequency in chronic pain, *Curr Opin Anaesthesiol*, 30(5): 577-582.

This policy statement relates only to the services or supplies described herein. Coverage will vary from contract to contract and by line of business and should be verified before applying the terms of the policy.