

## MEDICAL POLICY – 7.01.564

# Pulsed Radiofrequency


Effective Date: Oct. 1, 2024  
Last Revised: Sept. 23, 2024  
Replaces: N/A

RELATED MEDICAL POLICIES:

- 7.01.147 Minimally Invasive Ablation Procedures for Morton and Other Peripheral Neuromas
- 7.01.555 Facet Joint Denervation
- 7.01.563 Ablative Treatments for Occipital Neuralgia, Chronic Headaches, and Atypical Facial Pain
- 7.01.565 Ablation of Peripheral Nerves to Treat Pain

Select a hyperlink below to be directed to that section.

[POLICY CRITERIA](#) | [CODING](#) | [RELATED INFORMATION](#)  
[EVIDENCE REVIEW](#) | [REFERENCES](#) | [HISTORY](#)

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## Introduction

Radiofrequency ablation is a way of destroying part of nerves to treat pain. An electrical current is produced by radio waves. The current is applied to a small area of nerve tissue, thus destroying (ablating) part of the nerve and interrupting pain signals. Pulsed radiofrequency is similar to radiofrequency ablation in that it is still being studied. Instead of a constant current being applied, pulsed radiofrequency calls for short bursts of energy. These intermittent bursts of energy allow more electrical current to be applied while keeping temperatures below the range that would ablate the nerve. Pulsed radiofrequency is investigational (unproven) to treat pain. More, larger, and longer studies are needed to see if this technique is safe and effective.

**Note:** The Introduction section is for your general knowledge and is not to be taken as policy coverage criteria. The rest of the policy uses specific words and concepts familiar to medical professionals. It is intended for providers. A provider can be a person, such as a doctor, nurse, psychologist, or dentist. A provider also can be a place where medical care is given, like a hospital, clinic, or lab. This policy informs them about when a service may be covered.

## Policy Coverage Criteria

Procedure	Investigational
<p><b>Pulsed radiofrequency</b></p>	<p><b>Pulsed radiofrequency for the treatment of various chronic pain syndromes is considered investigational including, but not limited to, the following:</b></p> <ul style="list-style-type: none"> <li>• Anterior cutaneous nerve entrapment syndrome (abdominal pain)</li> <li>• Carpal tunnel syndrome</li> <li>• Chronic facial and head pain (persistent idiopathic facial pain (PIFP)/spheno-palatine ganglion)</li> <li>• Coccydynia</li> <li>• Complex regional pain syndrome (reflex sympathetic dystrophy)</li> <li>• Diabetic peripheral neuropathy</li> <li>• Discogenic pain</li> <li>• Facet joint pain (cervical, lumbar, thoracic, sacro-iliac)/zygapophyseal joint pain</li> <li>• Frozen shoulder (adhesive capsulitis)</li> <li>• Headaches (e.g., cervicogenic, migraines, cluster, tension)</li> <li>• Inguinal neuralgia</li> <li>• Intercostal neuralgia (post-surgical thoracic pain)</li> <li>• Low back pain</li> <li>• Lumbo-sacral radicular pain (e.g., dorsal root ganglion)</li> <li>• Meralgia paresthetica (burning pain in the outer thigh related to lateral femoral cutaneous nerve entrapment)</li> <li>• Metacarpal or metatarsal joint pain of the hands and feet</li> <li>• Morton's neuroma</li> <li>• Myofascial pain syndrome (gastrocnemius/trapezius muscle)</li> <li>• Neck pain (cervical radicular pain)</li> <li>• Occipital neuralgia</li> <li>• Ophthalmic neuralgia</li> <li>• Orchialgia (testicular pain/spermatic cord)</li> <li>• Osteoarthritis pain of the knee (genicular nerve, saphenous nerve, intra-articular) or hip</li> </ul>



Procedure	Investigational
	<ul style="list-style-type: none"> <li>• Pelvic pain (e.g., superior hypogastric plexus treatment for interstitial cystitis)</li> <li>• Peripheral neuromas</li> <li>• Piriformis syndrome (buttock pain and/or pain in the back of the lower extremity related to sciatic nerve irritation)</li> <li>• Plantar fasciitis (medial calcaneal nerve)</li> <li>• Post herpetic neuralgia (ophthalmic neuralgia)</li> <li>• Pudendal neuralgia</li> <li>• Sacro-iliac joint pain</li> <li>• Shoulder pain (suprascapular nerve) (hemiplegic shoulder pain after stroke)</li> <li>• Tarsal tunnel syndrome (compression neuropathy from entrapment of the posterior tibial nerve)</li> <li>• Trigeminal neuralgia (Gasserian ganglion)</li> <li>• Vulvodynia</li> </ul>

## Coding

Code	Description
<b>CPT</b>	
64999	Unlisted procedure, nervous system

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## Related Information

N/A

## Evidence Review



## Description

Pulsed radiofrequency (PRF) is a non- or minimally neurodestructive technique, where short bursts of radiofrequency energy are applied to nervous tissue to treat various chronic pain syndromes. It is seen as an alternative to continuous (non-pulsed) radiofrequency ablation, as it is theorized to have significantly less complications or side effects. Its exact mechanism of action is unclear.

## Background

Pulsed radiofrequency was first used in 1996 as a less destructive alternative to continuous (non-pulsed) radiofrequency. Pulsed radiofrequency is delivered in short bursts, twice per second, followed by a quiet phase in which no current is applied. This allows for cooling of the electrode keeping it below the neurodestructive threshold of 42° C. Pulsing the radiofrequency current allows the power output of the generator to be greatly increased, allowing for far stronger electrical fields than in continuous radiofrequency. For example, the voltage output is usually 15-25 volts for the continuous mode radiofrequency. The pulsed radiofrequency output is 45 volts. As a result, higher voltages can be applied in pulsed radiofrequency. Because the average temperature near the pulsed radiofrequency electrode does not reach the neurodestructive range, the risk of destroying nearby tissue is reduced.

Pulsed radiofrequency has been used in the treatment of peripheral neuropathies, arthrogenic pain, painful trigger points, radiculopathy, and many other chronic pain syndromes. Unlike the known side effects of continuous radiofrequency such as, neuritis-like reactions, motor deficits, and the risk of deafferentation pain syndrome, pulsed radiofrequency seems to have few side effects and is seen as relatively safe. However, even though there is much anecdotal evidence which favors the use of pulsed radiofrequency for the use of pain relief without nervous tissue damage, especially in the treatment of neuropathic pain, there is a lack of randomized controlled trials (RCTs) substantiating its efficacy.

## Summary of Evidence

For individuals with various chronic pain syndromes, especially neuropathic pain who received pulsed radiofrequency, the evidence includes a small number of RCTs, non-randomized controlled trials, prospective uncontrolled trials, retrospective studies, case series, and case reports. The majority of the uncontrolled and observational studies reported clinical efficacy of



pulsed radiofrequency, however many of these studies had limitations. The controlled clinical data is limited and with inconsistent findings. Further research in the clinical and biological effects of pulsed radiofrequency is needed including well-designed, randomized controlled clinical trials with a large sample size and long-term follow-up to determine the therapeutic effect and safety of this treatment modality. There is also a lack of data comparing pulsed radiofrequency with conventional treatments. As such, it is unknown if pulsed radiofrequency offers any treatment advantage over other conventional treatments. The evidence is insufficient to determine the effects of the technology on health outcomes.

## Ongoing and Unpublished Clinical Trials

Some currently ongoing and unpublished trials that might influence this review are listed in [Table 1](#).

**Table 1. Summary of Key Clinical Trials**

NCT No.	Trial Name	Planned Enrollment	Completion Date
<b>Ongoing</b>			
<a href="#">NCT02915120</a>	Ultrasound-Guided Pulsed Radiofrequency in the Treatment of Patients with Osteoarthritis Knee	142	July 2024 (recruiting)
<b>Unpublished</b>			
<a href="#">NCT03567590</a>	The Efficacy and Safety of Sphenopalatine Ganglion Pulsed Radiofrequency Treatment for Cluster Headache	80	Jan 2021 Completed
<a href="#">NCT04238598</a>	Intra-articular Pulsed Radiofrequency Neuromodulation Versus Intra-articular Steroids for Painful Knee Osteoarthritis	30	Sept 2021 Completed

NCT: national clinical trial



## Practice Guidelines and Position Statements

### American Society of Interventional Pain Physicians

The American Society of Interventional Pain Physicians (ASIPP) published an updated guideline on interventional techniques in the management of chronic spinal pain Part II guidance and recommendation which states the following:

- Lumbar spine
  - The evidence for therapeutic facet joint interventions is good for conventional radiofrequency, limited for pulsed radiofrequency, fair to good for lumbar facet joint nerve blocks, and limited for intraarticular injections
  - For sacroiliac interventions, the evidence for cooled radiofrequency neurotomy is fair; limited for intraarticular injections and periarticular injections; and limited for both pulsed radiofrequency and conventional radiofrequency neurotomy
- Cervical Spine
  - Evidence for therapeutic facet joint intervention is fair for conventional cervical radiofrequency neurotomy
- Thoracic Spine
  - Evidence is limited for radiofrequency neurotomy

### Medicare National Coverage

There is no national coverage determination.

### Regulatory Status

A number of radiofrequency generators and probes have been cleared for marketing through the US Food and Drug Administration (FDA) 510(k) process.

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## History

Date	Comments
09/01/18	New policy, approved August 14, 2018, effective December 6, 2018. Add to Surgery section. Policy created with a literature review through July 2018. Pulsed radiofrequency for the treatment of various chronic pain syndromes is considered investigational.
10/01/19	Annual Review, approved September 5, 2019. Policy updated with literature review. References added. Policy statement unchanged.
08/01/20	Update Related Policies. 7.01.565 is now 7.01.154.



Date	Comments
10/01/20	Annual Review, approved September 1, 2020. Policy updated with literature review. References added. Policy statement unchanged.
06/01/21	Annual Review, approved May 4, 2021. Policy updated with literature review. References added. Policy statements unchanged.
09/01/22	Annual Review, approved August 8, 2022. Policy updated with literature review. References added. Policy statements unchanged.
05/01/23	Annual Review, approved April 24, 2023. Added clarifying language to some policy statements for ease of identification only, policy intent unchanged. References added.
03/01/24	Update to Related Policies. 7.01.154 is now 7.01.565.
10/01/24	Annual Review, approved September 23, 2024. Policy reviewed. References added and deleted. Added anterior cutaneous nerve entrapment syndrome (abdominal pain), carpal tunnel syndrome, and frozen shoulder (adhesive capsulitis) to the list of chronic pain syndromes for which pulsed radiofrequency is considered investigational.

**Disclaimer:** This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. The Company adopts policies after careful review of published peer-reviewed scientific literature, national guidelines and local standards of practice. Since medical technology is constantly changing, the Company reserves the right to review and update policies as appropriate. Member contracts differ in their benefits. Always consult the member benefit booklet or contact a member service representative to determine coverage for a specific medical service or supply. CPT codes, descriptions and materials are copyrighted by the American Medical Association (AMA). ©2024 Premera All Rights Reserved.

**Scope:** Medical policies are systematically developed guidelines that serve as a resource for Company staff when determining coverage for specific medical procedures, drugs or devices. Coverage for medical services is subject to the limits and conditions of the member benefit plan. Members and their providers should consult the member benefit booklet or contact a customer service representative to determine whether there are any benefit limitations applicable to this service or supply. This medical policy does not apply to Medicare Advantage.

