7.01.147	Minimally Invasive Ablation Procedures for Morton and Other Peripheral Neuromas		
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Section:	7.0 Surgery	**Page:**	Page 1 of 14

Policy Statement

I. Minimally invasive ablation procedures, including intralesional alcohol injection, radiofrequency ablation, and cryoablation, are considered **investigational** for the treatment of Morton and other peripheral neuromas.

NOTE: Refer to Appendix A to see the policy statement changes (if any) from the previous version.

Policy Guidelines

Coding
See the Codes table for details.

Description

Morton neuroma is a common and painful compression neuropathy of the dorsal foot that is also referred to as intermetatarsal neuroma, interdigital neuroma, interdigital neuritis, and Morton metatarsalgia. Morton neuroma has been treated with conservative measures (pads, orthotics, drugs) or surgery. Minimally invasive procedures, including intralesional alcohol injection, radiofrequency ablation (RFA) and cryoablation, have been investigated as alternatives to open surgery. These methods have also been used to treat other peripheral neuromas.

Related Policies

- N/A

Benefit Application

Benefit determinations should be based in all cases on the applicable contract language. To the extent there are any conflicts between these guidelines and the contract language, the contract language will control. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

Some state or federal mandates (e.g., Federal Employee Program [FEP]) prohibits plans from denying Food and Drug Administration (FDA)-approved technologies as investigational. In these instances, plans may have to consider the coverage eligibility of FDA-approved technologies on the basis of medical necessity alone.

Regulatory Status

Alcohol injection for Morton neuroma is a surgical procedure and, as such, is not subject to regulation by the U.S. Food and Drug Administration (FDA).

Although RFA probes and generators and cryoablation equipment have been cleared for marketing by the FDA through the 510(k) process, none appear to be specifically indicated for the treatment of Morton neuroma or any other specific peripheral neuroma.

Rationale

Background

Neuroma

A neuroma is a pathology of a peripheral nerve that develops as part of a normal reparative process. Neuromas may develop after nerve injury or result from chronic irritation, pressure, stretch, poor repair of nerve lesions or previous neuromas, laceration, crush injury, or blunt trauma.[1,] Neuromas typically appear 6 to 10 weeks after trauma, with most presenting within 1 to 12 months after injury or surgery. They may gradually enlarge over 2 to 3 years and may or may not be painful. Pain from a neuroma may be secondary to traction on the nerve by scar tissue, compression of the sensitive nerve endings by adjacent soft tissues, ischemia of the nervous tissue, or ectopic foci of ion channels that elicit neuropathic pain. Patients may describe the pain as low-intensity dull pain or intense paroxysmal burning pain, often triggered by external stimuli such as touch or temperature. Neuroma formation has been implicated as a contributor of neuropathic pain in residual limb pain, postthoracotomy, postmastectomy, and postherniorrhaphy pain syndromes. Neuromas may coexist with phantom pain or can predispose to it.

Morton Neuroma

Morton neuroma is a common and painful compression neuropathy of the common digital nerve of the foot that may also be referred to as interdigital neuroma, interdigital neuritis, and interdigital or Morton metatarsalgia.[1,2,3,] It is histologically characterized by perineural fibrosis, endoneurial edema, axonal degeneration, and local vascular proliferation. Thus, some investigators do not consider Morton neuroma to be a true neuroma; instead, they consider it to be an entrapment neuropathy occurring secondary to compression of the common digital nerve under the overlying transverse metatarsal ligament. Morton neuroma appears 10-fold more often in women than in men, with an average age at presentation of around 50 years.[4,] The pain associated with Morton neuroma is usually throbbing, burning, or shooting, and localized to the plantar aspect of the foot. It is typically located between the 3rd and 4th metatarsal heads, although it may appear in other proximal locations.[1,2,] The pain may radiate to the toes and can be associated with paresthesia. The pain can be severe, and the condition may become debilitating to the extent that patients are apprehensive about walking or touching their foot to the ground. It is aggravated by walking in shoes with a narrow toe box or high heels that cause excessive pronation and excessive forefoot pressure; removal of tight shoes typically relieves the pain.

Diagnosis

Although a host of imaging methods are used to diagnosis Morton neuroma, including plain radiographs, magnetic resonance imaging, and ultrasonography, objective findings are unique to this condition and are primarily used to establish a clinical diagnosis.[1,] Thus, a patient's toes often show splaying or divergence. Patients may describe the feeling of a "lump" on the foot bottom or a feeling of walking on a rolled-up or wrinkled sock. Clinical examination with medial and lateral compression may reproduce the painful symptoms with a palpable "click" on interspace compression (Mulder sign).[5,]

Treatment

Management of patients diagnosed with Morton neuroma typically starts with conservative approaches, such as the use of metatarsal pads in shoes and orthotic devices that alter supination and pronation of the affected foot.[3,] These approaches try to reduce pressure and irritation of the affected nerve. They may provide relief, but do not alter the underlying pathology. There is scant evidence to support the effectiveness or comparative effectiveness of these practices. [2,6,7,] In a case series, Bennett et al (1995) evaluated a 3-stage protocol of "stepped care" through which private practice patients (N=115) advanced from stage I (education plus footwear modifications, and a metatarsal pad) to stage II (steroid injections with local anesthetic or local anesthetic alone), and into stage III (surgical resection) if stages I and II were not relieved within 3 months.[8,] Overall, 97 (85%) of

115 patients believed that pain had been reduced with the treatment program. However, 24 (21%) patients eventually required surgical excision of the nerve, and 23 (96%) of them had satisfactory results.

Minimally Invasive Ablation Procedures

Several minimally invasive procedures to treat refractory Morton and other peripheral neuromas are aimed at in situ destruction of the pathology , including intralesional alcohol injection, radiofrequency ablation (RFA) and cryoablation (also known as cryoneurolysis, cryolysis, and cryoanalgesia).[2,]

Dehydrated ethanol has been shown to inhibit nerve function in vitro, has high affinity for nerve tissue, and causes direct damage to nerve cells via dehydration, cell necrosis, and precipitation of protoplasm, leading to neuritis and a pattern of Wallerian degeneration.[2,] Technically, ethanol is a sclerosant that causes chemical neurolysis of the nerve pathology but is considered an ablative procedure for this evidence review. The use of ultrasound guidance during this procedure has been shown to increase surgical accuracy, improve outcomes, and shorten procedure duration. RFA uses heat generated by an electrode that conducts electromagnetic energy into a tissue or lesion to denature proteins and destroy cells. RFA is used to ablate a wide range of tissues or lesions, including osteoid osteoma; cardiovascular system pathologies; cervical pain syndromes; liver, lung, and other cancers; and varicosities.[9,-20,] Cryoablation uses coolant to chill a cryoprobe to temperatures below -75°C, which when inserted into a lesion, freezes and kills the tissue. It has been used to treat Morton neuroma, other chronic nerve pain syndromes, and conditions for which RFA has been used.[21,-,28,]

This review primarily focuses on evidence for the use of intralesional alcohol injection, RFA, and cryoablation on painful neuromas, with emphasis on Morton neuroma and the comparative effectiveness of these less invasive therapies with open surgical resection of the nerve pathology.

Literature Review

Evidence reviews assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.
To assess whether the evidence is sufficient to draw conclusions about the net health outcome of technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent 1 or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. Randomized controlled trials are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

Promotion of greater diversity and inclusion in clinical research of historically marginalized groups (e.g., People of Color [African-American, Asian, Black, Latino and Native American]; LGBTQIA (Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual); Women; and People with Disabilities [Physical and Invisible]) allows policy populations to be more reflective of and findings more applicable to our diverse members. While we also strive to use inclusive language related to these groups in our policies, use of gender-specific nouns (e.g., women, men, sisters, etc.) will continue when reflective of language used in publications describing study populations.

Minimally Invasive Ablation Procedures for Morton and Other Peripheral Neuromas

Clinical Context and Therapy Purpose

The purpose of minimally invasive ablation procedures in individuals who have Morton or other peripheral neuromas is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The following PICO was used to select literature to inform this review.

Populations

The relevant population of interest is individuals with peripheral neuromas, with emphasis on Morton neuroma.

Interventions

The therapies being considered are: intralesional alcohol injection, radiofrequency ablation (RFA), and cryoablation for painful neuromas.

Comparators

The following practices are currently being used to make decisions about the treatment of peripheral neuromas: conservative therapy and open surgical resection of the nerve pathology.

Outcomes

The general outcomes of interest are pain, typically measured with a visual analog score (VAS), ability to walk, and adverse events related to ablation procedures. The timing ranges from hours for the immediate effect of treatment, to months to assess recurrence of pain.

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies;
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought;
- Studies with duplicative or overlapping populations were excluded.

Intralesional Alcohol Injection for Morton Neuroma

Review of Evidence

Case Series

No RCTs or nonrandomized interventional trials were identified. Several published case series have used alcohol injections to treat Morton neuroma. Summaries of these series appear in Table 1. Treatment in all the case series consisted of injections of alcohol combined with an anesthetic (e.g., lidocaine or bupivacaine). Injections were repeated at 2-week intervals, if symptoms persisted. On average, across studies, each patient received approximately 4 injections. Ultrasound guidance was used in all of the series described in Table 1. Outcomes were patient-reported and consisted of various measures of pain and satisfaction.

The largest series identified was reported by Pasquali et al (2015), who described a retrospective 2-center case series of 508 patients who received ultrasound-guided alcohol injection from 2001 to 2012 for Morton neuroma.[29,] Eligible patients presented with 2nd or 3rd web space symptoms and had failed 3 months of conservative treatment with insoles and nonsteroidal anti-inflammatory drugs. Patients were injected with a 50% alcohol plus mepivacaine solution, with a mean of 3 injections (range, 1 to 4 injections) per neuroma. Pain at the Morton neuroma site was assessed on a VAS ranging from 0 to 10, by local adverse reactions at 1 week post-procedure (0 = no reaction; 1 =

minimal swelling, pain, redness; 2 = significant swelling, pain redness), and patient-reported satisfaction. Pain scores improved from a mean preinjection VAS score of 8.7 to a mean postinjection score of 3.6 at 1 year (change in VAS score, p<.001). At 1 year postinjection, 74.5% of patients were completely satisfied with the procedure. Fifty (9.3%) feet eventually required operative excision.

Table 1. Case Series of Intralesional Alcohol Injection for Morton Neuroma

Study	N	Treatment	Mean follow-up, mo	Results	Surgical follow-up, n (%)
Perini et al (2016)[30,]	220	Alcohol, lidocaine	19	• Median NRS pain score improved from 9 to 3 • 88.6% reported reductions in limitations of everyday activities • Reduction in neuropathic pain (100% to 45%) • No change in nociceptive pain (47% to 53%)	14 (6)
Pasquali et al (2015)[29,]	508	Alcohol, mepivacaine	12	• Mean VAS pain score improved from 8.7 to 3.6 • 74.5% completely satisfied	50 (9)
Musson et al (2012) [31,]	75	Alcohol, bupivacaine	14	• Mean VAS pain score improved from 8.5 to 4.2 • 32% complete symptom relief; 33% partial relief; 35% no relief	17 (20)
Hughes et al (2007)[32,]	101	Alcohol, bupivacaine	12	• Mean VAS pain score improved from 8 to 0 • 84% "essentially pain free"; 8% "mild/moderate pain"; 8% "no difference"	3 (3)
Fanucci et al (2004)[33,]	40	Alcohol, carbocaine	10	• 21 completely satisfied; 9 satisfied with minor complications; 6 satisfied with major complications; 4 dissatisfied	4 (10)

NRS: numeric rating scale; VAS: visual analog scale.

Morgan et al (2014)[34,] reported on a systematic review that included the studies above published through February 2012 plus another by Dockery (1999)[35,] and compared the need for subsequent surgery after alcohol injections for Morton neuroma with or without ultrasound guidance. Reviewers concluded that use of ultrasound guidance for alcohol injections to treat Morton neuroma could reduce the need for subsequent surgery better than unguided treatments.

Section Summary: Intralesional Alcohol Injection for Morton Neuroma

Case series of intralesional alcohol injection for Morton neuroma have generally found that many patients experience pain relief and express satisfaction with the procedure. Some evidence has suggested that surgery after failed cases of alcohol injections is more complex and challenging than in untreated patients due to the presence of fibrosis. There is a lack of controlled trials comparing alcohol injections with alternative therapies, and there are no controlled studies comparing outcomes for alcohol injections with those for surgery in surgical candidates.

Radiofrequency Ablation for Morton Neuroma

Review of Evidence

Case Series

Four case series reporting outcomes of RFA for treating Morton neuroma are summarized in Table 2 and Table 3.

Genon et al (2010) reported on a retrospective review of a single center's experience with RFA to treat Morton neuroma according to a clinical algorithm that proceeds from nonoperative interventions to RFA and to open neurectomy if initial approaches failed.[36,] Thirty-seven patients who had failed conservative management (not described) and had symptoms for at least 12 months in duration were treated with RFA using a NeuroTherm NT1000 (NeuroTherm) radiofrequency generator. At an average follow-up of 11 months (range, 3 to 21 months), among the 37 patients (38 neuromas) treated, 7 (18%) reported complete relief of symptoms, 21 (55%) reported partial relief, and 10 (26%) reported no relief. Mean numeric rating scale (NRS) decreased from 9.0 (interquartile range [IQR], 8.0 to 9.0) pre-intervention to 5.0 (IQR 3.0 to 8.0) post-intervention. Of 38 neuromas, 11 (28.9%) required open surgical revision following RFA.

Moore et al (2012) reported on a second retrospective series of RFA management of Morton neuroma.[37,] This series included 29 patients (22 women; age range, 23 to 73 years) who had not responded to conservative management (primarily steroid and alcohol injections) over 1 to 2 months. Patients were treated with RFA (Smith & Nephew) under monitored anesthesia using an electrode inserted dorsally with fluoroscopic guidance. Among the 29 patients, 24 (83%) expressed complete relief of symptoms 1 month after RFA; none reported more pain. The remaining 5 (17%) had minimal to no relief. Of them, one had an open revision , and the others had no additional treatment or were lost to follow-up. One patient reported recurrence 9 months following RFA, and another had superficial cellulitis that responded to antibiotic therapy. All patients returned to normal shoe gear and activities within 2 days of RFA.

Chuter et al (2013) reported on a third retrospective series of RFA to treat Morton neuroma.[38,] This series included 25 patients (21 women) with a mean age of 55 years (range, 33 to 73 years) who had a mean symptom duration of 3.8 years (range, 6 months to 15 years). All failed conservative management. Before RFA, patients had an average pain score of 6.0 (range, 3.0 to 9.0) on a 10-point VAS. Four weeks after RFA, the average VAS pain score was 1.7 (range, 0 to 8.0; p<.001), an average symptom improvement of 76%. The only complication reported involved a patient who experienced irritation of the posterior tibial nerve following the procedure. Three (9%) patients proceeded to open surgical excision within 6 months of RFA due to incomplete pain relief or recurrence.

The most recent case series retrospectively reviewed the records of 32 (25 women; mean age 46 years) patients who underwent RFA for treatment of Morton neuroma following failure of conservative management that included orthotic treatments, alcohol injection, and corticosteroid injection.[39,] Compared with pre-intervention, significant reductions in pain scores (p=.001) were found after a single treatment in 21 patients (65%). The remaining 11 patients (35%) underwent a second ablation procedure, of whom 10 reported significant pain reduction following the second procedure. No patients were reported to have undergone open surgical revision, although 6 patients (19%) required a corticosteroid injection within 6 weeks of RFA due to the return of pain. No harms of treatment were reported.

Table 2. Summary of Case Series Characteristics of Radiofrequency Ablation for Morton Neuroma

Study	Country	Participants	Follow-Up
Genon et al (2010)[36,]	Australia	n=37 (38 neuromas) with previously failed conservative management	11 months
Moore et al (2012)[37,]	United States	n=29 (32 neuromas) with previously failed conservative management	13 months
Chuter et al (2013)[38,]	United Kingdom	n=25 (30 neuromas) with previously failed conservative management	6 months
Connors et al (2020)[39,]	United States	n=32 (33 neuromas) with previously failed conservative management	34 to 35 months

Table 3. Summary of Case Series Results of Radiofrequency Ablation for Morton Neuroma

Study	Treatment	Symptom Relief	Pain	Need for Surgical Revision
Genon et al (2010)[36,]	RFA	Proportion with: Complete symptom resolution: 18% (7/38 neuromas) Partial symptom resolution: 55% (21/38 neuromas) No symptom resolution: 26% (10/38 neuromas)	Mean pain pre-intervention: NRS 9.0 (IQR, 8.0 to 9.0) Mean pain post-intervention: NRS 5.0 (IQR, 3.0 to 8.0)	28.9% (11/38 neuromas)
Moore et al (2012)[37,]	Fluoroscopically-guided RFA	Proportion with: Complete symptom resolution: 83% (24/29 patients) No or minimal resolution: 17% (5/29 patients)	Pain scores not reported	3.4% (1/29 patients)
Chuter et al (2013)[38,]	Ultrasound-guided RFA	Proportion with a "satisfactory outcome": 86.7% (26/30 neuromas)	Mean pain pre-intervention: VAS 6.0 (range, 3.0 to 9.0) Mean pain post-intervention: VAS 1.7 (range, 0 to 8.0); p<.001	9.4% (3/32 patients)
Connors et al (2020)[39,]	RFA	Median success score (scale 0 to 100; higher score=greater subjective success): 92.5 (IQR, 50 to 100)	Mean pain pre-intervention: VAS 7.0 (IQR, 4.75 to 8.0); Mean pain post-intervention: VAS 1.0 (IQR, 0 to 5.0); p=.001	None reported

IQR: interquartile range; NRS: numeric rating scale; RFA: radiofrequency ablation; VAS: visual analog scale.

Section Summary: Radiofrequency Ablation for Morton Neuroma

Four case series have reported outcomes of RFA to treat Morton neuroma. The body of evidence is highly heterogeneous regarding RFA protocols used, prior conservative management, patient characteristics, follow-up durations, outcome measures, and the reporting of outcomes (e.g., using denominators of "feet," "neuromas," or "patients"). Although favorable outcomes were achieved in substantial proportions in each study, the outcome measures were unclear as to their clinical meaning, except the VAS used in the Chuter report. Furthermore, in all case series, a highly variable proportion of patients required further surgical excision, making the value of prior RFA uncertain.

Cryoablation for Morton Neuroma

Review of Evidence

Case Series

Two retrospective case series on the use of cryoablation to treat peripheral nerve pain have been identified.

One case series by Friedman et al (2012) reported on a series of patients who had undergone sonographically guided cryoneurolysis.[40,] Among a cohort of 20 patients, 5 had Morton neuroma (all women; mean age, 55 years). Cryotherapy was administered with a Frigitronics CE 2000 (Cooper Surgical) device using nitrous oxide coolant. A cryoprobe was inserted into the Morton neuroma; the probe temperature was decreased to -75°C and left in place until a continuous series of ice balls was created (one or two 3-minute cycles of cooling). Patients were scheduled for follow-up at 4 to 6 weeks. However, actual follow-up varied due to patient discretion. Among the 5 Morton neuroma patients, 3 had "marked relief," 1 had "moderate relief," and 1 had no relief, at a mean follow-up of 14 weeks (range, 6 weeks to 14 months). Complications of cryoablation were not reported.

The second case series, by Cazzato et al (2016), retrospectively described 20 patients (24 lesions) with Morton neuroma who underwent magnetic resonance-guided cryoablation.[41,] All patients were previously treated with ultrasound-guided corticosteroid injections and had not reported relief. While positioned in the magnetic resonance unit, a cryoprobe (Ice-Seed; Galil Medical) was inserted into the center of the lesion. A single freezing cycle of 150 seconds was performed. Mean procedural time was 41 minutes (range, 35 to 60 minutes). Patients were followed with a telephone survey. The number of months between procedure and last follow-up ranged from 1 to 50 months. Results were reported by lesion, with data available for 18 of the 24 lesions treated. Patients with 14 (78%) of the 18 lesions were "completely satisfied," 17% were "satisfied with minor reservations," and 6% were "satisfied with major reservations." Mean local pain score was 3.0 on a 0-to-10 VAS. Post-VAS scores were not available.

Section Summary: Cryoablation for Morton Neuroma

Two retrospective case series have investigated cryoablation to treat Morton neuroma. The body of evidence is heterogeneous regarding cryoablation protocols used, prior conservative management, and length of follow-up. Although large proportions of patients reported satisfaction with the procedure in both studies, daily functioning did not clearly improve after the procedure. The weaknesses in the body of evidence preclude conclusions on the efficacy of cryoablation for Morton neuroma.

Other Painful Neuromas

Review of Evidence

The literature review for this update did not identify any controlled studies on the use of ablative techniques to treat painful peripheral neuromas other than Morton neuroma. Two recent review articles reported little evidence for any other sites.[1,40,]

Section Summary: Other Painful Neuromas

The current literature base on the use of ablative techniques for peripheral neuromas other than Morton neuroma provides insufficient data on which to form conclusions about treatment efficacy.

Supplemental Information

The purpose of the following information is to provide reference material. Inclusion does not imply endorsement or alignment with the evidence review conclusions.

Clinical Input From Physician Specialty Societies and Academic Medical Centers

While the various physician specialty societies and academic medical centers may collaborate with and make recommendations during this process, through the provision of appropriate reviewers, input received does not represent an endorsement or position statement by the physician specialty societies or academic medical centers, unless otherwise noted.

2015 Input

In response to requests, input was received from 2 specialty societies and 5 academic medical centers while this policy was under review in 2015. Input was consistent that the use of alcohol injections to treat Morton neuroma is investigational.

Practice Guidelines and Position Statements

Guidelines or position statements will be considered for inclusion in ‘Supplemental Information' if they were issued by, or jointly by, a US professional society, an international society with US representation, or National Institute for Health and Care Excellence (NICE). Priority will be given to guidelines that are informed by a systematic review, include strength of evidence ratings, and include a description of management of conflict of interest.

Association of Extremity Nerve Surgeons

The Association of Extremity Nerve Surgeons issued practice guidelines (2020)[42,] which drew the following conclusions:

- We do not recommend ablation in the primary treatment of Intermetatarsal Nerve Entrapment ("Morton's Neuroma").
  - Alcohol injections: The literature regarding alcohol injections is equivocal. There may be some short-term positive effect, but long-term effect is poor for this therapy. Some of the literature recommends using 30% alcohol solution to get effective results. However, new research has shown the use of 30% alcohol does not create any measurable change in the histology of nerve tissue. There is also a moderate risk of necrosis of surrounding tissues. As a general rule, we do not advocate the use of alcohol injections.
  - Radiofrequency ablation: Radiofrequency ablation has use in the lower extremity, but must be done with caution as this procedure has the potential for thermal necrosis of the adjacent tissues. Judicious use of fluoroscopy and other visualization techniques is advised while utilizing radiofrequency ablation…further research in this technique is needed.
  - Cryoablation: Cryoablation (cryotherapy) should be used with extreme caution, as the amount of literature in the lower extremity is limited. If cryotherapy is used, it should ideally be performed with an open technique rather than percutaneously for optimal results.

U.S. Preventive Services Task Force Recommendations
Not applicable.

Medicare National Coverage
There is no national coverage determination. In the absence of a national coverage determination, coverage decisions are left to the discretion of local Medicare carriers.

Ongoing and Unpublished Clinical Trials
Some currently ongoing and unpublished trials that might influence this review are listed in Table 4.

Table 4. Summary of Key Trials

NCT No.	Trial Name	Planned Enrollment	Completion Date
Ongoing			
NCT05501262	Comparative Effectiveness of Cryoablation Using the ICE-Seed Cryoablation Needle With Steroid and Lidocaine Versus Steroid and Lidocaine Alone for Treatment of Morton's Neuroma	32	Dec 2023
Unpublished			
NCT02838758	A 3-Arm Randomized Controlled Study Comparing Ultrasound-Guided Cryoablation, Ultrasound-Guided Perineural Lidocaine, and Ultrasound-Guided Perineural Saline to Treat Intrametatarsal Neuroma	66 (actual enrollment: 10)	Jun 2018*

NCT: national clinical trial.
*As of May 2021, no results posted.

References

1. Rajput K, Reddy S, Shankar H. Painful neuromas. Clin J Pain. Sep 2012; 28(7): 639-45. PMID 22699131
2. Jain S, Mannan K. The diagnosis and management of Morton's neuroma: a literature review. Foot Ankle Spec. Aug 2013; 6(4): 307-17. PMID 23811947
3. Thomas JL, Blitch EL, Chaney DM, et al. Diagnosis and treatment of forefoot disorders. Section 3. Morton's intermetatarsal neuroma. J Foot Ankle Surg. 2009; 48(2): 251-6. PMID 19232980
4. Wu KK. Morton's interdigital neuroma: a clinical review of its etiology, treatment, and results. J Foot Ankle Surg. 1996; 35(2): 112-9; discussion 187-8. PMID 8722878

5. MULDER JD. The causative mechanism in morton's metatarsalgia. J Bone Joint Surg Br. Feb 1951; 33-B(1): 94-5. PMID 14814167
6. Adams WR. Morton's neuroma. Clin Podiatr Med Surg. Oct 2010; 27(4): 535-45. PMID 20934103
7. Thomson CE, Gibson JN, Martin D. Interventions for the treatment of Morton's neuroma. Cochrane Database Syst Rev. 2004; 2004(3): CD003118. PMID 15266472
8. Bennett GL, Graham CE, Mauldin DM. Morton's interdigital neuroma: a comprehensive treatment protocol. Foot Ankle Int. Dec 1995; 16(12): 760-3. PMID 8749346
9. Dierselhuis EF, van den Eerden PJ, Hoekstra HJ, et al. Radiofrequency ablation in the treatment of cartilaginous lesions in the long bones: results of a pilot study. Bone Joint J. Nov 2014; 96-B(11): 1540-5. PMID 25371471
10. Boersma D, van Eekeren RR, Kelder HJ, et al. Mechanochemical endovenous ablation versus radiofrequency ablation in the treatment of primary small saphenous vein insufficiency (MESSI trial): study protocol for a randomized controlled trial. Trials. Oct 29 2014; 15: 421. PMID 25354769
11. Di Costanzo GG, Tortora R, D'Adamo G, et al. Radiofrequency ablation versus laser ablation for the treatment of small hepatocellular carcinoma in cirrhosis: a randomized trial. J Gastroenterol Hepatol. Mar 2015; 30(3): 559-65. PMID 25251043
12. Anchala PR, Irving WD, Hillen TJ, et al. Treatment of metastatic spinal lesions with a navigational bipolar radiofrequency ablation device: a multicenter retrospective study. Pain Physician. 2014; 17(4): 317-27. PMID 25054391
13. Hillen TJ, Anchala P, Friedman MV, et al. Treatment of metastatic posterior vertebral body osseous tumors by using a targeted bipolar radiofrequency ablation device: technical note. Radiology. Oct 2014; 273(1): 261-7. PMID 24927327
14. Wang X, Wang X, Song Y, et al. Efficiency of radiofrequency ablation for surgical treatment of chronic atrial fibrillation in rheumatic valvular disease. Int J Cardiol. Jul 01 2014; 174(3): 497-502. PMID 24820759
15. Huang WZ, Wu YM, Ye HY, et al. Comparison of the outcomes of monopolar and bipolar radiofrequency ablation in surgical treatment of atrial fibrillation. Chin Med Sci J. Mar 2014; 29(1): 28-32. PMID 24698675
16. Avery J, Kumar K, Thakur V, et al. Radiofrequency ablation as first-line treatment of varicose veins. Am Surg. Mar 2014; 80(3): 231-5. PMID 24666862
17. Hiraki T, Gobara H, Iguchi T, et al. Radiofrequency ablation as treatment for pulmonary metastasis of colorectal cancer. World J Gastroenterol. Jan 28 2014; 20(4): 988-96. PMID 24574771
18. Morillo CA, Verma A, Connolly SJ, et al. Radiofrequency ablation vs antiarrhythmic drugs as first-line treatment of paroxysmal atrial fibrillation (RAAFT-2): a randomized trial. JAMA. Feb 19 2014; 311(7): 692-700. PMID 24549549
19. Fuller CW, Nguyen SA, Lohia S, et al. Radiofrequency ablation for treatment of benign thyroid nodules: systematic review. Laryngoscope. Jan 2014; 124(1): 346-53. PMID 24122763
20. Huang XM, Hu JQ, Li ZF, et al. Symptomatic sinus tachycardia with perpetuating slow pathway: successful treatment with radiofrequency ablation. Pacing Clin Electrophysiol. Oct 2014; 37(10): e1-4. PMID 21077914
21. Prologo JD, Passalacqua M, Patel I, et al. Image-guided cryoablation for the treatment of painful musculoskeletal metastatic disease: a single-center experience. Skeletal Radiol. Nov 2014; 43(11): 1551-9. PMID 24972918
22. Kim EH, Tanagho YS, Saad NE, et al. Comparison of laparoscopic and percutaneous cryoablation for treatment of renal masses. Urology. May 2014; 83(5): 1081-7. PMID 24560975
23. Durand M, Barret E, Galiano M, et al. Focal cryoablation: a treatment option for unilateral low-risk prostate cancer. BJU Int. Jan 2014; 113(1): 56-64. PMID 24053685
24. Duarte R, Pereira T, Pinto P, et al. [Percutaneous Image-guided cryoablation for localized bone plasmacytoma treatment]. Radiologia. 2014; 56(5): e1-4. PMID 22621822
25. Rodriguez-Entem FJ, Expósito V, Gonzalez-Enriquez S, et al. Cryoablation versus radiofrequency ablation for the treatment of atrioventricular nodal reentrant tachycardia:

results of a prospective randomized study. J Interv Card Electrophysiol. Jan 2013; 36(1): 41-5; discussion 45. PMID 23080326
26. Yamauchi Y, Izumi Y, Hashimoto K, et al. Percutaneous cryoablation for the treatment of medically inoperable stage I non-small cell lung cancer. PLoS One. 2012; 7(3): e33223. PMID 22413004
27. Collins KK, Schaffer MS. Use of cryoablation for treatment of tachyarrhythmias in 2010: survey of current practices of pediatric electrophysiologists. Pacing Clin Electrophysiol. Mar 2011; 34(3): 304-8. PMID 21077912
28. Kaufman CS, Bachman B, Littrup PJ, et al. Cryoablation treatment of benign breast lesions with 12-month follow-up. Am J Surg. Oct 2004; 188(4): 340-8. PMID 15474424
29. Pasquali C, Vulcano E, Novario R, et al. Ultrasound-guided alcohol injection for Morton's neuroma. Foot Ankle Int. Jan 2015; 36(1): 55-9. PMID 25367249
30. Perini L, Perini C, Tagliapietra M, et al. Percutaneous alcohol injection under sonographic guidance in Morton's neuroma: follow-up in 220 treated lesions. Radiol Med. Jul 2016; 121(7): 597-604. PMID 26883232
31. Musson RE, Sawhney JS, Lamb L, et al. Ultrasound guided alcohol ablation of Morton's neuroma. Foot Ankle Int. Mar 2012; 33(3): 196-201. PMID 22734280
32. Hughes RJ, Ali K, Jones H, et al. Treatment of Morton's neuroma with alcohol injection under sonographic guidance: follow-up of 101 cases. AJR Am J Roentgenol. Jun 2007; 188(6): 1535-9. PMID 17515373
33. Fanucci E, Masala S, Fabiano S, et al. Treatment of intermetatarsal Morton's neuroma with alcohol injection under US guide: 10-month follow-up. Eur Radiol. Mar 2004; 14(3): 514-8. PMID 14531002
34. Morgan P, Monaghan W, Richards S. A systematic review of ultrasound-guided and non-ultrasound-guided therapeutic injections to treat Morton's neuroma. J Am Podiatr Med Assoc. Jul 2014; 104(4): 337-48. PMID 25076076
35. Dockery GL. The treatment of intermetatarsal neuromas with 4% alcohol sclerosing injections. J Foot Ankle Surg. 1999; 38(6): 403-8. PMID 10614611
36. Genon MP, Chin TY, Bedi HS, et al. Radio-frequency ablation for the treatment of Morton's neuroma. ANZ J Surg. Sep 2010; 80(9): 583-5. PMID 20857612
37. Moore JL, Rosen R, Cohen J, et al. Radiofrequency thermoneurolysis for the treatment of Morton's neuroma. J Foot Ankle Surg. 2012; 51(1): 20-2. PMID 22055491
38. Chuter GS, Chua YP, Connell DA, et al. Ultrasound-guided radiofrequency ablation in the management of interdigital (Morton's) neuroma. Skeletal Radiol. Jan 2013; 42(1): 107-11. PMID 23073898
39. Connors JC, Boike AM, Rao N, et al. Radiofrequency Ablation for the Treatment of Painful Neuroma. J Foot Ankle Surg. 2020; 59(3): 457-461. PMID 32354501
40. Friedman T, Richman D, Adler R. Sonographically guided cryoneurolysis: preliminary experience and clinical outcomes. J Ultrasound Med. Dec 2012; 31(12): 2025-34. PMID 23197557
41. Cazzato RL, Garnon J, Ramamurthy N, et al. Percutaneous MR-Guided Cryoablation of Morton's Neuroma: Rationale and Technical Details After the First 20 Patients. Cardiovasc Intervent Radiol. Oct 2016; 39(10): 1491-8. PMID 27189181
42. The Association of Extremity Nerve Surgeons Clinical Practice Guidelines v. 2.0. 2020. Accessed May 8, 2023.

Documentation for Clinical Review

- No records required

Coding

This Policy relates only to the services or supplies described herein. Benefits may vary according to product design; therefore, contract language should be reviewed before applying the terms of the Policy.

The following codes are included below for informational purposes. Inclusion or exclusion of a code(s) does not constitute or imply member coverage or provider reimbursement policy. Policy Statements are intended to provide member coverage information and may include the use of some codes for clarity. The Policy Guidelines section may also provide additional information for how to interpret the Policy Statements and to provide coding guidance in some cases.

Type	Code	Description
CPT®	64632	Destruction by neurolytic agent; plantar common digital nerve
	64640	Destruction by neurolytic agent; other peripheral nerve or branch
	0441T	Ablation, percutaneous, cryoablation, includes imaging guidance; lower extremity distal/peripheral nerve
HCPCS	None	

Policy History

This section provides a chronological history of the activities, updates and changes that have occurred with this Medical Policy.

Effective Date	Action
08/01/2016	BCBSA Medical Policy Adoption
08/01/2017	Policy revision without position change
08/01/2018	Policy revision without position change
09/01/2019	Policy revision without position change
09/01/2022	Policy reactivated. Previously archived from 7/1/2020 to 8/31/2022. Annual review. Policy statement, guidelines and literature review updated. Coding update.
08/01/2023	Annual review. No change to policy statement. Literature review updated.
08/01/2024	Annual review. No change to policy statement. Policy guidelines updated.

Definitions of Decision Determinations

Medically Necessary: Services that are Medically Necessary include only those which have been established as safe and effective, are furnished under generally accepted professional standards to treat illness, injury or medical condition, and which, as determined by Blue Shield, are: (a) consistent with Blue Shield medical policy; (b) consistent with the symptoms or diagnosis; (c) not furnished primarily for the convenience of the patient, the attending Physician or other provider; (d) furnished at the most appropriate level which can be provided safely and effectively to the patient; and (e) not more costly than an alternative service or sequence of services at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of the Member's illness, injury, or disease.

Investigational/Experimental: A treatment, procedure, or drug is investigational when it has not been recognized as safe and effective for use in treating the particular condition in accordance with generally accepted professional medical standards. This includes services where approval by the federal or state governmental is required prior to use, but has not yet been granted.

Split Evaluation: Blue Shield of California/Blue Shield of California Life & Health Insurance Company (Blue Shield) policy review can result in a split evaluation, where a treatment, procedure, or drug will be considered to be investigational for certain indications or conditions, but will be deemed safe and effective for other indications or conditions, and therefore potentially medically necessary in those instances.

Prior Authorization Requirements and Feedback (as applicable to your plan)

Within five days before the actual date of service, the provider must confirm with Blue Shield that the member's health plan coverage is still in effect. Blue Shield reserves the right to revoke an authorization prior to services being rendered based on cancellation of the member's eligibility. Final determination of benefits will be made after review of the claim for limitations or exclusions.

Questions regarding the applicability of this policy should be directed to the Prior Authorization Department at (800) 541-6652, or the Transplant Case Management Department at (800) 637-2066 ext. 3507708 or visit the provider portal at www.blueshieldca.com/provider.

We are interested in receiving feedback relative to developing, adopting, and reviewing criteria for medical policy. Any licensed practitioner who is contracted with Blue Shield of California or Blue Shield of California Promise Health Plan is welcome to provide comments, suggestions, or concerns. Our internal policy committees will receive and take your comments into consideration.

For utilization and medical policy feedback, please send comments to: MedPolicy@blueshieldca.com

Disclaimer: This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. Blue Shield of California may consider published peer-reviewed scientific literature, national guidelines, and local standards of practice in developing its medical policy. Federal and state law, as well as contract language, including definitions and specific contract provisions/exclusions, take precedence over medical policy and must be considered first in determining covered services. Member contracts may differ in their benefits. Blue Shield reserves the right to review and update policies as appropriate.

Appendix A

POLICY STATEMENT (No changes)	
BEFORE	**AFTER**
Minimally Invasive Ablation Procedures for Morton and Other Peripheral Neuromas 7.01.147 **Policy Statement:** I. Minimally invasive ablation procedures, including intralesional alcohol injection, radiofrequency ablation, and cryoablation, are considered **investigational** for the treatment of Morton and other peripheral neuromas.	**Minimally Invasive Ablation Procedures for Morton and Other Peripheral Neuromas 7.01.147** **Policy Statement:** I. Minimally invasive ablation procedures, including intralesional alcohol injection, radiofrequency ablation, and cryoablation, are considered **investigational** for the treatment of Morton and other peripheral neuromas.