No review or update is scheduled on this Medical Policy. Blue Cross and Blue Shield of Kansas will continue to monitor published literature for any updated information. If there are questions about coverage of this service, please contact Blue Cross and Blue Shield of Kansas customer service, or your professional / institutional relations representative.

Medical Policy

BlueCross BlueShield Kansas
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Title: Alcohol Injection Therapy for Morton's Neuroma

Professional / Institutional
Original Effective Date: June 3, 2011
Latest Review Date: September 21, 2023
Current Effective Date: September 21, 2023

Archived Date: October 24, 2023

State and Federal mandates and health plan member contract language, including specific provisions/exclusions, take precedence over Medical Policy and must be considered first in determining eligibility for coverage. To verify a member's benefits, contact Blue Cross and Blue Shield of Kansas Customer Service.

The BCBSKS Medical Policies contained herein are for informational purposes and apply only to members who have health insurance through BCBSKS or who are covered by a self-insured group plan administered by BCBSKS. Medical Policy for FEP members is subject to FEP medical policy which may differ from BCBSKS Medical Policy.

The medical policies do not constitute medical advice or medical care. Treating health care providers are independent contractors and are neither employees nor agents of Blue Cross and Blue Shield of Kansas and are solely responsible for diagnosis, treatment and medical advice.

If your patient is covered under a different Blue Cross and Blue Shield plan, please refer to the Medical Policies of that plan.

Populations	Interventions	Comparators	Outcomes
Individuals: • With Morton's neuroma	Interventions of interest are: • Intralesional alcohol injection(s)	Comparators of interest are: • Conservative therapy (e.g., rest, metatarsal supports) • Surgical excision	Relevant outcomes include: • Symptoms • Resource utilization • Treatment-related morbidity

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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 is usually treated with conservative measures, surgery, or minimally invasive procedures. Alcohol injection is a minimally invasive alternative to open surgery to treat Morton neuroma. Alcohol causes chemical neurolysis through dehydration, necrosis, and precipitation of the treated area, ultimately destroying the lesion after multiple injections.

OBJECTIVE

The objective of this policy is to determine whether the use of alcohol injections improves the net health outcome in individuals with Morton's neuroma compared with surgery or other conservative therapy.

BACKGROUND

Neuroma

A neuroma is a growth or tumor consisting of nerve tissue that develops as part of a normal reparative process following nerve injury. The injury may be due to 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, post thoracotomy, postmastectomy, and post herniorrhaphy pain syndromes. They 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, 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. The incidence and prevalence of Morton neuroma are not clear, but it 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, 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 are aimed at reducing pressure and irritation of the affected nerve. They may provide relief, but they do not alter the underlying pathology. There is little evidence supporting 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 private practice patients (N=115) who 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 treated while in stages I and II did not bring relief within 3 months.6, Overall, 97 (85%) of 115 patients believed that pain had been reduced with the treatment program. However, twenty-four (21%) patients eventually required surgical excision of the nerve and 23 (96%) of those had satisfactory results.

Ablation Techniques
Alternative approaches to treat refractory Morton neuroma include minimally invasive procedures aimed at in situ destruction, including intralesional alcohol injections.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. 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.

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

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POLICY

Alcohol injections are considered **experimental / investigational** for treatment of Morton neuroma.

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.

RATIONALE

This evidence review has been updated regularly with searches of the PubMed database. The most recent literature update was performed through April 1, 2020.

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 a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent one 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 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.

INTRALESIONAL ALCOHOL INJECTIONS FOR MORTON NEUROMA

Clinical Context and Therapy Purpose

The purpose of intralesional alcohol injection therapy for patients who have Morton neuroma is to provide a treatment option that is an alternative to or an improvement on existing therapies.

The question addressed in this evidence review is: Does use of alcohol injections improve health outcomes for patients with Morton neuroma compared with conservative therapy or surgery?

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

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Patients
The relevant population of interest is individuals with Morton neuroma.

Interventions
The therapy being considered is an intralesional injection of alcohol.

Comparators
The following therapies are currently being used: conservative therapy (e.g., rest, metatarsal supports) and surgical excision.

Outcomes
The general outcomes of interest are reduction in pain, improvement in function, and patient satisfaction.

Patients are followed within 1 to 2 weeks after an injection to determine pain reduction and patient satisfaction. Additional injections may occur in subsequent 1 to 2 months to achieve the level of desired pain reduction for the patient.

REVIEW OF EVIDENCE

Case Series
No randomized controlled trials 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.[7,] 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, 1-4 injections) per neuroma. Pain at the Morton neuroma site was assessed on a visual analog scale (VAS) ranging from 0 to 10, by local adverse reactions at 1 week postprocedure (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, $p<0.001$). At 1 year postinjection, 74.5% of patients were completely satisfied with the procedure. Fifty (9.3%) feet eventually required operative excision.

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

Study	N	Treatment	Mean FU, mo	Results	Surgical FU, n (%)
Perini et al(2016)[8,]	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)[7,]	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)[9,]	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)[10,]	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)
TFanucci et al(2004)[11,]	40	Alcohol, carbocaine	10	• 21 completely satisfied; 9 satisfied with minor complications; 6 satisfied with major complications; 4 dissatisfied	4 (10)

FU: follow-up; NRS: numeric rating scale; VAS: visual analog scale.

Morgan et al (2014)[12,] reported on a systematic review that included the studies above published through February 2012 plus another by Dockery (1999)[13,] 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.

Summary of Evidence

For individuals who have Morton neuroma who receive intralesional alcohol injection(s), the evidence includes retrospective case series. Relevant outcomes are symptoms, resource utilization, and treatment-related morbidity. The body of evidence is limited, consisting of case series reporting on the treatment response of patients with refractory Morton neuroma. The available series have generally reported that some 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. The evidence is insufficient to determine the effects of the technology on health outcomes.

CLINICAL INPUT RECEIVED 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

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reviewers, input received does not represent an endorsement or position statement by the physician specialty societies or academic medical centers, unless otherwise noted.

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

PRACTICE GUIDELINES AND POSITION STATEMENTS

American College of Foot and Ankle Surgeons

The American College of Foot and Ankle Surgeons released a clinical practice guideline (now referred to as a clinical consensus statement) in 2009 on the diagnosis and treatment of forefoot disorders.[3] The consensus statement reports that 3 to 7 dilute alcohol injections of 4% alcohol injected at 5 to 10 day intervals has been associated with an 89% success rate with 82% of patients achieving complete relief of symptoms. The statement's pathway for treatment of intermetatarsal space neuroma lists decompression, excision, and cryogenic neuroablation under surgical management options.

Association of Extremity Nerve Surgeons

The Association of Extremity Nerve Surgeons issued practice guidelines (2014) which drew the following conclusions about alcohol injections[14,]:
"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, there is not enough data to support the use of alcohol. As a general rule, we do not advocate the use of alcohol injections."

U.S. Preventive Services Task Force Recommendations

Not applicable.

Ongoing And Unpublished Clinical Trials

A search of ClinicalTrials.gov in May 2019 did not identify any ongoing or unpublished trials that would likely influence this policy.

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CODING

The following codes for treatment and procedures applicable to this policy are included below for informational purposes. This may not be a comprehensive list of procedure codes applicable to this policy.

Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement. 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.

The code(s) listed below are medically necessary ONLY if the procedure is performed according to the "Policy" section of this document.

CPT/HCPCS	
For Percutaneous Alcohol Nerve Sclerosing (PANS) injections:	
64455	Injection(s), anesthetic agent and/or steroid, plantar common digital nerve(s) (e.g., Morton's neuroma)
For Percutaneous Alcohol Nerve Destruction (PAND) injections (Morton's neuroma):	
64632	Destruction by neurolytic agent; plantar common digital nerve

REVISIONS	
06-03-2011	Policy added to the bcbsks.com web site.
04-26-2013	Policy reviewed.
	In Coding section: ▪ Added ICD-10 diagnoses codes. *(Effective October 1, 2014)*
	Updated Reference section.
05-26-2015	In Coding section: ▪ Updated effective date of ICD-10 diagnosis codes to October 1, 2015.
08-04-2016	Updated Description section.
	Updated Rationale section.
	Updated References section.
10-01-2016	In Coding section: ▪ Added ICD-10 code effective 10-01-2016: G57.63
07-11-2017	Updated Description section.
	Updated Rationale section.
	Updated References section.
08-15-2018	Updated Description section.
	Updated Rationale section.
	In Coding section: ▪ Removed ICD-9 codes.
	Updated References section.
07-17-2019	Updated Description section.

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REVISIONS	
	Updated Rationale section.
	Updated References section.
03-11-2021	Medical policy was reviewed with no revision.
Posted 08-22-2023 Effective 09-21-2023	Updated Policy Section ▪ Policy statement changed to: "Alcohol injections are considered experimental / investigational for treatment of Morton neuroma." ▪ Removed previous statement: A. "Clinical Indications for Percutaneous Alcohol (4-29% solution) Nerve Sclerosing (PANS) Injections PANS injections may be considered medically necessary for treatment of Morton's neuroma when all of the following conservative therapies, performed within 6 months of the initiation of PANS, have been attempted and have been documented as having failed: 1. Change in shoe types that are reported to result in neuroma-like symptoms 2. Change or limitation in activities that are reported to result in neuroma-like symptoms 3. Use of metatarsal pads (placed proximal to the metatarsal heads) to reduce pressure on the nerve by "spreading the metatarsals" 4. Cortisone injections administered 2 (minimum) to 3 times in a 6 week period (unless documented to be otherwise contraindicated) PANS injections are expected to be performed according to the following protocol: 1. Two injections (CPT 64455 administered at 5-10 day intervals) Note: If the patient is unable to tolerate a second injection, PANS treatment would be terminated. 2. If there is a clinically significant positive response - symptoms reduced - reported and documented after 2 injections, up to 5 additional (or less if the patient reports elimination of neuroma symptoms) injections at 5-10 day intervals may be administered if symptoms persist. 3. If, however, two consecutive PANS injections fail to achieve continued and clinically significant symptom improvement, subsequent PANS injections would be considered not medically necessary and not reimbursed. Documentation failing to report interval status improvements prior to the administration of the next injection will be considered to be evidence of a lack of symptom improvement. B. Clinical Indications for Percutaneous Alcohol (30-100% solution) Nerve Destruction (PAND) Injections PAND injections (CPT 64632) may be considered medically necessary for treatment of Morton's neuroma when all of the following conservative therapies, performed within 6 months of the initiation of PAND, have been attempted and have been documented as having failed: 1. Change in shoe types that are reported to result in neuroma-like symptoms 2. Change or limitation in activities that are reported to result in neuroma-like symptoms 3. Use of metatarsal pads (placed proximal to the metatarsal heads) to reduce pressure on the nerve by "spreading the metatarsals" 4. Cortisone injections administered 2 (minimum) to 3 times in a 6 week period (unless documented to be otherwise contraindicated) 5. A minimum of 2 percutaneous alcohol nerve sclerosing injections with no significant clinical improvement documented. Initiation of PAND injections would not be appropriate if PANS injections are not tolerated PAND injections are expected to be performed according to the following protocol: 1. Ultrasonic or fluoroscopic imaging guidance (hard copy clear images must be recorded and available, upon request, for review)

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REVISIONS	
	NOTE: The imaging guidance needle placement is considered part of the injection global fee and not separately reimbursed. 2. If there is a clinically significant positive response - symptoms reduced - reported and documented after 2 injections, up to 3 additional (or less if the patient reports elimination of neuroma symptoms) injections at 14 day intervals may be administered. 3. If, however, two consecutive PAND injections fail to achieve continued and clinically significant symptom improvement, subsequent PAND injections would be considered not medically necessary and not reimbursed. Documentation failing to report interval status improvements prior to the administration of the next injection will be considered to be evidence of a lack of symptom improvement. C. PANS injections and PAND injections are considered not medically necessary when the above indications are not met."
	Updated Policy Guidelines ▪ Removed Policy Guidelines "A. The medical record must adequately describe the patient's clinical state (history. physical findings, laboratory and other tests), e.g., identification of the problem including diagnosis, precipitating events, quantity and quality of pain, test results, response to previous conservative treatment, as well as any other pertinent evaluation and management elements of the history, examination, and medical decision making. B. The medical record must contain documentation indicating the reason for the procedure, the concentration of the alcohol solution injected, and a description of the procedure performed – including whether imaging guidance was used. C. When a specific neuroma is injected, it will be considered one injection service regardless of the number of injections administered at that specific anatomical location on a single date of service. D. The medical necessity for injections of more than two sites at one session is considered uncommon. Performance and submitting claims for such injections are likely to result in a request for medical records that must clearly document the medical necessity of these additional injections. E. Failure of percutaneous alcohol nerve sclerosing (PANS) injections to achieve long term elimination or clinically significant reduction in symptoms precludes the medical necessity for repeated or continued PANS injections. F. Failure of percutaneous alcohol nerve destruction (PAND) injections to achieve long term elimination or clinically significant reduction in symptoms precludes the medical necessity for repeated or continued PAND injections. G. Payment for all substances injected is included in the amount paid for the injection and not separately reimbursable."
	Updated Coding Section ▪ Removed ICD-10 Codes
10-24-2023	Archived

REFERENCES

1. Rajput K, Reddy S, Shankar H. Painful neuromas. Clin J Pain. Sep 2012;28(7):639-645. 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):307-317. PMID 23811947

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3. Clinical Practice Guideline Forefoot Disorders Panel, Thomas JL, Blitch EL, et al. Diagnosis and treatment of forefoot disorders. Section 3. Morton's intermetatarsal neuroma. J Foot Ankle Surg. Mar-Apr 2009;48(2):251-256. PMID 19232980
4. Wu KK. Morton's interdigital neuroma: a clinical review of its etiology, treatment, and results. J Foot Ankle Surg. Mar-Apr 1996;35(2):112-119; discussion 187-118. PMID 8722878
5. Mulder JD. The causative mechanism in Morton's metatarsalgia. J Bone Joint Surg Br. Feb 1951;33-B(1):94-95. PMID 14814167
6. Bennett GL, Graham CE, Mauldin DM. Morton's interdigital neuroma: a comprehensive treatment protocol. Foot Ankle Int. Dec 1995;16(12):760-763. PMID 8749346
7. Pasquali C, Vulcano E, Novario R, et al. Ultrasound-guided alcohol injection for Morton's neuroma. Foot Ankle Int. Jan 2015;36(1):55-59. PMID 25367249
8. 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
9. 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
10. 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):1535-1539. PMID 17515373
11. 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. Oct 2004;14(3):514-518. PMID 14531002
12. 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):337-348. PMID 25076076
13. Dockery GL. The treatment of intermetatarsal neuromas with 4% alcohol sclerosing injections. J Foot Ankle Surg. Nov-Dec 1999;38(6):403-408. PMID 10614611
14. Barrett SL, Nickerson DS, Elison P, et al. Clinical Practice Guidelines 2014, Edition 1. Wimberley, TX: Association of Extremity Nerve Surgeons; 2014.

Other References

1. Considine Podiatry Consultant 3/14/2011; January, 2021.
2. Blue Cross and Blue Shield of Kansas Podiatry Liaison Committee, February 2012, January 2013, January 2018, January 2021, July 2023.