

02.01.52 Injection Therapy for Headache Management

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Related Policies

- [02.01.72 Biofeedback as a Treatment of Headache](#)
- [07.01.66 Treatments for Occipital Neuralgia, Chronic Headaches and Persistent Idiopathic Facial Pain](#)

Summary

Description

A headache including migraine and non-migraine types are common conditions, and the available treatments are not universally effective. Proposed treatment options is injecting/blocking the sphenopalatine ganglion (SPG), stellate ganglion, supraorbital nerve, occipital nerve, or trigeminal nerve nerve(s).

Summary of Evidence

For individuals who have chronic migraine who receive sphenopalatine ganglion (SPG) block(s), the evidence includes a randomized controlled trial (RCT) and a case report. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. The randomized trial evaluated a regimen of 12 SPG blocks over 6 weeks and was double-blind and placebo controlled. The trial found significantly greater short-term (up to 24 hours) benefits from active treatment than from placebo. There were no significant long-term effects (i.e., 1 and 6 months after 12 treatments), although the trial was underpowered to detect longer term efficacy. Given that SPG blocks are being proposed as a preventive therapy for chronic migraines, evidence demonstrating reduced migraine frequency, severity, or other objective outcomes from robust trials is still needed. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have cluster headaches who receive sphenopalatine ganglion (SPG) block(s), the evidence includes case series. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. Two small case series, both of which evaluated an approach for intranasal sphenopalatine ganglion (SPG) blocks that differs from the intervention currently available in the United States, were identified. In these series, 40% to 50% of patients experienced complete symptom relief for a variable length of time and about 20% had treatment-related complications. However, it is not clear from these series the degree to which the procedures evaluated differ in safety and efficacy from an intranasal SPG block using a device cleared by the U.S. Food and Drug Administration. Additional studies, preferably RCTs, are needed to evaluate SPG blocks for treating cluster headaches. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have postdural puncture headache (PDPH) who receive sphenopalatine ganglion (SPG) block(s), the evidence includes a systematic review of 9 RCTs. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. The systematic review included 9 RCTs (N=381) comparing SPG blocks to various PDPH treatments or sham. The SPG blocks consisted of various lidocaine concentrations (2% to 10%) with some studies combining lidocaine with ropivacaine, dexamethasone, or epinephrine. The primary outcome was the pooled assessment of the pain at various intervals. SPG blocks significantly improved pain compared with controls at 30 minutes, 1 hour, and 4 hours, but not at 2 hours, 6 hours, 8 hours, 12 hours, or 24 hours. The use of rescue treatment was similar between groups. Limitations of the analysis include the variety of anesthetic strengths and combinations used for SPG, the open-label design of the majority of the studies, and the small sample size of the studies. Additional studies, preferably RCTs with larger sample sizes, are needed to evaluate SPG blocks for treating PDPH. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have headaches the evidence regarding peripheral nerve injections/nerve blocks used at various locations around the face and neck (occipital nerve, trigeminal nerve, supraorbital nerve, and stellate ganglion) to reduce pain and inflammation using injectable anesthetic, steroids, or other agents to all headache indications, including but not limited to the treatment of migraines and non-migraine headaches consists of systematic reviews, RCTs, and observations studies. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. The majority of the evidence on using peripheral nerve injections/nerve blocks used at various locations around the face and neck relates to peripheral nerve injections/nerve blocks of the occipital nerve. There is considerable variability and heterogeneity among patient population, injection site(s), and medication selection. Studies had small sample sizes, lacked a sham treatment, alternative therapy, and long-term outcomes. No studies were identified that were adequately powered that have directly evaluated whether using injection therapy/nerve blocks to the supraorbital nerve for headache management improves the health outcomes

such as a reduction in in headache frequency, intensity, and medication use. The evidence is insufficient to support a conclusion concerning the net health outcomes or benefits associated with this procedure.

Additional Information

Not applicable

OBJECTIVE

The objective of this evidence review is to determine injection therapy improves the net health outcome in individuals with headaches compared with other accepted headache treatments.

PRIOR APPROVAL

Not applicable.

POLICY

Nerve Block(s)/Injection Therapy

Nerve block(s)/injection therapy of local anesthetics, steroids, or other agents to the stellate ganglion, supraorbital nerve, occipital nerve, or trigeminal nerve is considered **investigational** for the treatment of all headache indications, including but not limited to the treatment of migraines and non-migraine headaches because the evidence is insufficient to determine the technology results in an improvement in the net health outcomes.

Sphenopalatine Ganglion (SPG) Block(s)

Sphenopalatine ganglion (SPG) block(s) are considered **investigational** for all headache indications, including but not limited to the treatment of migraines and non-migraine headaches because the evidence is insufficient to determine the technology results in an improvement in the net health outcomes.

Note: For botulinum toxin type A injections, please see Pharmacy Policy, [05.01.02 Neuromuscular Blocking Agents](#).

POLICY GUIDELINES

International Headache Society classification criteria (3rd edition, 2018) are listed in Table PG1.

Table PG1. International Headache Society Classification Criteria for Migraines

Classification Criteria
Migraine without aura
Description
Recurrent headache disorder characterized by attacks lasting 4 to 72 hours.
Diagnostic criteria
A. At least 5 attacks fulfilling criteria B through D

Classification Criteria
B. Headache attacks lasting 4 to 72 hours (untreated or successfully treated)
C. At least 2 of the following 4 characteristics: 1. unilateral location; 2. pulsating quality; 3. moderate or severe pain intensity; 4. aggravation by or causing avoidance of routine physical activity (e.g., walking or climbing stairs)
D. During headache, at least 1 of the following: 1. nausea and/or vomiting; 2. photophobia and phonophobia
E. Not better accounted for by another ICHD-3 diagnosis
Migraine with aura
Description
Recurrent attacks, lasting minutes, of unilateral fully reversible visual, sensory or other central nervous system symptoms that usually develop gradually and are usually followed by headache and associated migraine symptoms.
Diagnostic criteria
A. At least 2 attacks fulfilling criteria B and C
B. One or more of the following fully reversible aura symptoms: 1. visual; 2. sensory; 3. speech and/or language; 4. motor; 5. brainstem; 6. retinal
C. At least 3 of the following 6 characteristics: 1. at least 1 aura symptom spreads gradually over ≥ 5 minutes; 2. 2 or more aura symptoms occur in succession; 3. each individual aura symptom lasts 5 to 60 minutes; 4. at least 1 aura symptom is unilateral; 5. at least 1 aura symptom is positive; 6. the aura is accompanied, or followed within 60 minutes, by headache
D. Not better accounted for by another ICHD-3 diagnosis, and transient ischemic attack has been excluded.

Adapted from Headache Classification Committee of the International Headache Society (2018; available at <http://www.ihs-headache.org/ichd-guidelines>). ICHD-3: International Classification of Headache Disorders, 3rd edition.

Coding

See the [Codes table](#) for details.

BACKGROUND

Headaches and Headache Treatments

Headaches are common neurologic disorders and are among the top reasons why patients seek medical care. Headaches affect approximately 40% of the general population in a given year and are more common in men than women. The 2 most common types of headaches are migraines and tension-type headaches.

Migraines are the second-most common headache disorder, with a 1-year migraine prevalence of approximately 12% in the United States. Migraines can be categorized by headache frequency, and by

the presence or absence of aura. Chronic migraine is defined as attacks on at least 15 days per month for more than 3 months, with features of migraine on at least 8 days per month.

Tension-type headaches have a prevalence of approximately 40%. Diagnostic criteria include the presence of at least 2 of the following 4 characteristics: bilateral headache location, non-pulsating pain, mild-to-moderate intensity, and headache not aggravated by physical activity; lasting between 30 minutes and 7 days; and not accompanied by nausea, vomiting, photophobia, or phonophobia.

Cluster headaches are less common than tension or migraine headaches, with an estimated prevalence of 0.1% of the population. They are characterized by severe unilateral orbital, supraorbital, and/or temporal pain that also includes other symptoms in the eye and/or nose on the same side (e.g., rhinorrhea, eyelid edema or drooping).

Postdural puncture headache (PDPH), is a common complication of lumbar puncture. This headache also occurs with low cerebrospinal fluid volume from a leak at the site of the dural puncture, resulting in low cerebrospinal pressure and intracranial hypotension. Individuals undergoing epidural anesthesia are also at risk for PDPH due to unintended dural puncture, which has been reported to occur in <1% to 6% of obstetric individuals. PDPH is characterized by a bilateral frontal or occipital headache that worsens with sitting or standing and is relieved in the supine position. Associated symptoms may include nausea, neck stiffness, low back pain, tinnitus, and visual disturbances. The reported incidence of PDPH as a complication of lumbar puncture is variable, ranging from 10% to 40% of lumbar puncture procedures. Incidence may be as low as 2% when small gauge, non-cutting needles are used.

Chronic Daily Headaches

Chronic daily headache (CDH) is a descriptive term that encompasses several different specific headache diagnoses characterized by frequent headaches. Primary CDH subtypes of long duration (i.e., four hours or more) include chronic migraine and chronic tension-type headache. Primary headache types of shorter duration that can be chronic and occur daily are chronic cluster headache, chronic paroxysmal hemicrania and primary headache disorders such as cervicogenic headache.

- **Chronic Migraine:** Migraine is a common disabling primary headache disorder. Chronic migraine headache is defined as greater than or equal to 15 days per month lasting 4 hours a day or longer in an adult individual for more than 3 months, with features of migraine on at least 8 days per month.
- **Chronic tension type headache:** Frequent episodic tension type headache, with daily or very frequent episodes of headache, typically bilateral, pressing to tightening in quality and of mild to moderate intensity, lasting hours, to days or unremitting. The pain does not worsen with routine physical activity, but may be associated with mild nausea, photophobia or phonophobia.
- **Chronic cluster headache:** Chronic cluster headaches is one of the trigeminal autonomic cephalalgias (TACs), a group of primary headache disorders characterized by unilateral trigeminal distribution pain that occurs in association with ipsilateral cranial autonomic features. Cluster headache is characterized by attacks of severe unilateral, orbital, supraorbital or temporal pain. In the episodic form, attacks occur daily, usually one to eight times a day for several weeks, followed by a period of remission. The chronic form of cluster headaches occurs for more than 1 year without remissions, or with remission periods lasting less than 1 month.
- **Cervicogenic headache:** The clinical features of cervicogenic headache may mimic those associated with primary headache disorders (e.g., tension-type headache, migraine, or hemicranias continua), making it difficult to distinguish among headache types. Cervicogenic headaches is characterized by continuous, unilateral head pain radiating from the occipital areas to the front area, with associated neck pain and ipsilateral shoulder or arm pain. The headache is moderate in intensity with non-throbbing character. It is described as dull, boring, dragging pain that can fluctuate in intensity. The

duration of the headache may range from a few hours to several days, and in some cases several weeks. The pain can be exacerbated by neck movements and is usually caused by neck trauma.

- The anatomic point for cervicogenic headache is the trigeminocervical nucleus in the upper cervical spinal cord, where sensory nerve fibers in the descending tract of the trigeminal nerve are believed to interact with sensory fibers from the upper cervical roots. This functional intersection of upper cervical and trigeminal sensory pathways is thought to allow bidirectional transmission of pain signals between the neck and the trigeminal sensory receptor fields of the face and head.
- Cervicogenic headache is typically caused by a disorder of the cervical spine and its component bony, disc and/or soft tissue elements, usually but not invariably accompanied by neck pain.

A variety of medications are used to treat acute/chronic migraine episodes. These include medications taken at the onset of an attack to abort the attack (e.g., triptans, ergotamine's, lasmiditan, calcitonin-gene related peptide antagonists) and medications to treat the pain and other symptoms of migraines once they are established (e.g., nonsteroidal anti-inflammatory drugs, antiemetics). Prophylactic medication therapy may be appropriate for people with migraines that occur more than 2 days per week. In addition to medication, behavioral treatments (e.g., relaxation, cognitive therapy) are used to manage migraine headache. Botulinum toxin type A injections are FDA-approved treatment for chronic migraine prophylaxis (see Pharmacy Policy, [05.01.02 Neuromuscular Blocking Agents](#)).

Severe acute/chronic cluster headaches may be treated with abortive therapy including breathing 100% oxygen, and triptan medications. Other medications used to treat cluster headaches include steroids, calcium channel blockers, and nerve pain medications. Due to the severity of pain associated with cluster headaches, patients may seek emergency treatment. Tension-type headaches are generally treated with over-the-counter pain medication.

Injections / Nerve Blocks Stellate Ganglion, Supraorbital, Occipital, or Trigeminal Nerves

Peripheral nerve injections/nerve blocks may also be used at various locations around the face and neck (occipital nerve, trigeminal nerve, supraorbital nerve, and stellate ganglion) to reduce pain and inflammation using injectable anesthetic, steroids, or other agents to manage headaches. Frontal headaches are believed to be activated by irritation of the supratrochlear and suborbital nerves by glabellar muscles or vessels. Temporal headaches may be activated by inflammation of the zygomaticotemporal branch of the trigeminal nerve by the temporalis muscles or vessels adjacent to the nerve. Rhinogenic headaches may involve intranasal abnormalities (e.g., deviated septum), which may irritate the end branches of the trigeminal nerve. Finally, occipital headaches may be triggered by irritation of the occipital nerve caused by the semispinalis capitis muscle or the occipital artery. Stellate ganglion have been proposed as a treatment option for tension type and migraine headaches.

Although clinicians commonly utilize these peripheral nerve injections/nerve blocks to manage headaches the procedure has yet to be standardized for this indication.

Non-Migraine Headache

It has been proposed that other types of headaches (e.g., tension headaches) may also be triggered by irritation of the trigeminal nerve.

Treatment

Although the mechanism of action is less well established for headaches other than migraine, it is proposed that injection therapy/nerve blocks of trigger sites have been proposed for some non-migraine headaches.

Sphenopalatine Ganglion Block

Sphenopalatine ganglion (SPG) blocks are a proposed treatment option for chronic migraines and some severe non-migraine headaches. The SPG is a group of nerve cells located behind the bony structures of the nose. The nerve bundle is linked to the trigeminal nerve, the primary nerve involved in headache disorders. The SPG has both autonomic nerves, which in this case are associated with functions such as tearing and nasal congestion, and sensory nerves, associated with pain perception. These blocks involve topical application of local anesthetic to mucosa overlying the SPG. The rationale for using SPG blocks to treat headaches is that local anesthetics in low concentrations could block the sensory fibers and thereby reduce pain while maintaining autonomic function.

The proposed procedure for SPG blockade is to insert an intranasal catheter that is attached to a syringe carrying local anesthetic (e.g., lidocaine, bupivacaine). Once the catheter is in place, the local anesthetic is applied to the posterior wall of the nasal cavity and reaches the SPG. Originally, SPG blocks were done by inserting a cotton-tipped applicator dabbed with local anesthetic into the nose; this technique may be less accurate and effective than the currently proposed procedure. Neurostimulation of the SPG and SPG blockade with radiofrequency lesioning have been used outside of the United States, but these treatments are not cleared or approved by the FDA.

Three catheter devices are commercially available in the United States for performing SPG blocks. The catheters have somewhat different designs, but all are attached to syringes to deliver local anesthetic. The catheters are inserted intranasally and, once in place, the local anesthetic is applied through the catheter. With 2 of the 3 commercially available catheters (the SphenoCath®, Allevio® Nerve Block Catheter™), individuals are positioned on their back with their nose pointed vertically and their head turned to the side. With the Tx360® device, individuals remain seated.

The optimal number and frequency of SPG treatments is unclear. Information from the American Migraine Foundation suggests that the procedure can be repeated as often as needed to control pain. A randomized controlled trial has described a course of treatment for migraines consisting of SPG blocks twice a week for 6 weeks (total, 12 treatments).

Sphenopalatine ganglion blocks are proposed for both short- and long-term treatment of headaches and migraines. When used in the emergency setting in individuals with severe acute headaches, the goal of treatment is to abort the current headache while the individual is in the emergency department. In the randomized controlled trial that provided a 6-week course of treatment with SPG blocks for chronic migraine (mentioned above), short-term outcomes were assessed up to 24 hours after each treatment, and the duration and frequency of chronic migraines were assessed at 1 and 6 months after the course of treatment.

Regulatory Status

The Tx360 Nasal Applicator Device (Tian Medical), the Allevio SPG Nerve Block Catheter (CureMed), and the SphenoCath (Dolor Technologies) are considered class I devices by the U.S. Food and Drug Administration (FDA) and are exempt from 510(k) requirements. This classification does not require submission of clinical data on efficacy but only notification of FDA prior to marketing. All 3 devices are used to apply local anesthetic intranasally.

Local injection/block therapy of headache triggers are a procedure and, as such, is not subject to regulation approval or clearance.

Please note this section is not intended to be all-inclusive.

RATIONALE

This evidence review was created in December 2013 and has been updated regularly with searches of the PubMed database. The most recent literature update was performed through December 2025.

Evidence reviews assess the clinical evidence to determine whether the use of 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 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 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. RCTs 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.

Sphenopalatine Ganglion (SPG) Block(s): Chronic Migraine

Clinical Context and Therapy Purpose

The purpose of sphenopalatine ganglion (SPG) block(s) in individuals who have chronic migraine headache 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 chronic migraine headache.

Interventions

The therapy being considered is a SPG block.

Comparators

The following therapies and practices are currently being used to treat chronic migraine headache: medication, self-management (e.g., relaxation, exercise), and botulinum toxin injection.

Outcomes

The general outcomes of interest are reductions in migraine frequency, intensity, and medication use. Treatment-related adverse events are minor. A series of injections may be given over several weeks, with follow-up over months to monitor for treatment effect and durability.

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;
- Due to a typically high placebo response rate in patients with headache, placebo-controlled trials were preferred;
- Studies with duplicative or overlapping populations were excluded.

Review of Evidence

Randomized Controlled Trials

Findings from a double-blind, placebo controlled RCT that evaluated SPG blocks to treat chronic migraine were published in 2 publications by Cady et al (2015). The first publication reported on the primary outcome measure and key secondary outcomes, and the subsequent publication reported on supplemental secondary outcomes and longer-term follow-up. The trial included patients who met International Classification of Headache Disorders-II diagnostic criteria for chronic migraine and had chronic migraine for at least 3 months. Patients could use concomitant headache medication but had to agree not to change medication use during the study period. Following an initial 28-day baseline period to confirm the diagnosis of chronic migraine, patients were randomized 2:1 to treatment with bupivacaine 0.5% or saline (placebo) applied using the Tx360 device. Patients received a series of 12 treatments - 2 treatments a week for 6 weeks. The primary outcome was change in pain severity, measured using a 0-to-10 numeric rating scale. Pain severity was assessed 15 minutes, 30 minutes, and 24 hours after each treatment. Key secondary outcome measures were the Patient's Global Impression of Change, the Headache Impact Test (HIT-6) questionnaire, and patient satisfaction with treatment. In addition, patients kept headache diaries throughout the study.

Forty-one patients met eligibility criteria and had chronic migraine diagnoses confirmed during the baseline period. These patients were randomized to bupivacaine (n=27) or to placebo (n=13). Mean baseline scores on the numeric rating scale were 4.8 in the bupivacaine group and 4.5 in the placebo group. When findings for all treatments were pooled, patients in the bupivacaine group reported a significantly greater reduction in numeric rating scale scores than the placebo group at 15 minutes, 30 minutes, and 24 hours after treatment. Bupivacaine-treated patients also had significantly lower Patient's Global Impression of Change scores than saline-treated patients at 30 minutes and 24 hours posttreatment. No statistically significant between-group differences were reported in HIT-6 scores or in average acute medication use. Only 1 serious adverse event was reported, and it was not treatment related.

The second publication by Cady et al reported on 1- and 6- month follow-up results and on supplemental secondary end points. To control for multiple comparisons, the cutoff for statistical significance for the supplemental secondary end points was $p < .01$. There were no statistically significant differences between groups in the reported supplementary secondary outcomes. These outcomes included the number of headache days per month, the mean pain score, and quality of life measures. A post hoc power analysis revealed that the trial was underpowered to detect significant differences in secondary outcomes. Some

results were suggestive of a long-term effect. For example, the bupivacaine group had a lower, albeit nonsignificant, number of headache days in the month posttreatment (17 days) than the placebo group (23 days). However, a trial with a larger sample size would be needed to confirm whether 1- or 6-month results are significantly better after bupivacaine than after placebo treatment.

Section Summary: Sphenopalatine Ganglion (SPG) Block(s): Chronic Migraine

One double-blind, placebo-controlled, randomized trial has evaluated transnasal SPG blocks for chronic migraine. The trial found a significantly greater short-term (up to 24 hours) reduction in pain severity after active treatment versus placebo. However, there were no significant longer-term effects on other outcomes (i.e., 1 and 6 months after 12 treatments over 6 weeks). The trial was underpowered to detect outcomes at 1 and 6 months. It had some risks of bias due to a high rate of dropouts. Additional adequately powered trials are needed to determine the impact of SPG blocks on health outcomes.

Sphenopalatine Ganglion (SPG) Block(s): Cluster Headache

Clinical Context and Therapy Purpose

The purpose of SPG block(s) in individuals who have cluster headaches 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 cluster headache.

Interventions

The therapy being considered is a SPG block.

Comparators

The following therapies are currently being used to treat cluster headaches: medication and oxygen therapy.

Outcomes

The general outcomes of interest are reductions in headache frequency, intensity, and medication use. Treatment-related adverse events are minor. A series of injections may be given over several weeks, with follow-up over months to monitor for treatment effect and durability.

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;
- Due to a typically high placebo response rate in patients with headache, placebo-controlled trials were preferred;
- Studies with duplicative or overlapping populations were excluded.

Review of Evidence

No RCTs or nonrandomized controlled studies were identified that evaluated 1 of the 3 catheter devices commercially available in the United States for performing SPG blocks for treating cluster headache.

Case Series

Two case series in individuals with chronic drug-resistant cluster headache were published by a research group in Italy. Both studies used a needle (20-gauge in 1 study, 18-gauge in the other) under endoscopic control to inject a mixture of local anesthetics and steroid as close as possible to the SPG. The mixture consisted of triamcinolone acetonide (40 mg), 1% bupivacaine (4 mL), and 2% mepivacaine with 1/100,000 adrenaline (2 mL).

Pipolo et al (2010) reported on 15 patients who received 3 SPG block treatments a mean of 3 days apart. Eight (53%) of the 15 patients experienced complete remission of cluster headache symptoms. Three (20%) of these continued to be in remission at last follow-up (mean, 18 months). One (7%) patient experienced partial benefit and 6 (40%) reported either no benefit or a benefit for less than 2 weeks. Three (20%) patients experienced complications, including 2 cases of severe epistaxis and 1 of reduced buccal opening that resolved after 5 months.

The earlier study by Felisati et al (2006), included 21 patients who received between 2 and 4 total treatment sessions, provided 1 week apart. Including 1 patient in whom the treatment could not be applied, 9 (45%) experienced no efficacy, 3 (15%) experienced a partial benefit, and 8 (40%) experienced a complete temporary benefit. In the 8 patients who had complete disappearance of attacks, the benefit lasted 2 to 4 weeks in 3 patients, 3 to 6 months in 3 patients, and 12 to 24 months in 2 patients. Four (19%) patients experienced treatment-related complications, which consisted of 1 case of marked nasal epistaxis 3 days after the procedure and 3 cases of temporary diplopia.

Section Summary: Sphenopalatine Ganglion (SPG) Block(s): Cluster Headache

The literature includes 2 case series, both of which were published by the same research group in Italy. The approach to treatment was similar in both studies but differed in terms of medication and application technique currently used in the United States. It is unclear how the safety or efficacy of the procedure used in the case series differs from an intranasal SPG block applying local anesthetics and using a U.S. Food and Drug Administration cleared device. In these series, 40% to 50% of individuals experienced complete symptom relief for a variable length of time and about 20% had treatment-related complications. These studies had small sample sizes and lacked a sham treatment or alternative therapy for treating cluster headache.

Sphenopalatine Ganglion (SPG) Block(s) for Postdural Puncture Headache

Clinical Context and Therapy Purpose

The purpose of sphenopalatine ganglion (SPG) block(s) in individuals who have a postdural puncture headache (PDPH) 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 postdural puncture headache (PDPH).

Interventions

The therapy being considered is sphenopalatine ganglion (SPG) block(s).

Comparators

The following therapies are currently being used to treat postdural puncture headache (PDPH): conservative therapy (e.g., bed rest, oral or intravenous hydration), medication (e.g., analgesics, caffeine, antiemetics), and epidural blood patch. Epidural blood patch is considered the definitive treatment for PDPH.

Outcomes

The general outcomes of interest are reduction in headache intensity and duration, medication use, and avoidance of epidural blood patch use.

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;
- Due to a typically high placebo response rate in patients with headache, placebo-controlled trials were preferred;
- Studies with duplicative or overlapping populations were excluded.

Review of Evidence

Systematic Reviews

Dwivedi et al (2023) published a systematic review and meta-analysis of 9 RCTs comparing SPG block to other treatments in patients with PDPH. The SPG blocks consisted of various lidocaine concentrations (2% to 10%) with some studies combining lidocaine with ropivacaine, dexamethasone, or epinephrine. Comparators included sham block with saline, intranasal lidocaine block, greater occipital nerve block, or pharmacotherapy. Six studies were considered to have "some concern" for bias while the remaining 3 had a low risk of bias. Efficacy outcomes included pain at various time points from 30 minutes up to 7 days after intervention. Tables 1 through 3 summarize the included studies, characteristics, and results of the meta-analysis, respectively. Limitations of the of the studies include the variety of anesthetic strengths and combinations used for SPG, the open-label design of the majority of the studies, and the small sample sizes.

Table 1. Comparison of Trials/Studies Included in the Systematic Review/Meta-Analysis

Study	Dwivedi et al (2023)
Abotaleb et al (2022)	●
Bohara et al (2022)	●
Jespersen et al (2020)	●
Kumar et al (2021)	●
Mowafi et al (2021)	●
Nazir et al (2021)	●
Puthenveettil et al (2018)	●

Yilmaz et al (2020)	●
Youssef et al (2021)	●

Table 2. Systematic Review & Meta-Analysis Characteristics

Study	Dates	Trials	Participants	N (Range)	Design	Duration
Dwivedi et al (2023)	Through Oct 2022	9	Pts with PDPH treated with SPG block vs placebo or other intervention	381 (20-100)	RCT	Up to 7 days after intervention

PDPH: postdural puncture headache; RCT: randomized controlled trial; SPG: sphenopalatine ganglion.

Table 3. Systematic Review & Meta-Analysis Results

Study	Pain at 30 Minutes	Pain at 2 Hours	Pain at 24 Hours	Treatment Failure
Dwivedi et al (2023)				
Total N	271	211	251	293
Pooled effect (95% CI)	SMD: -1.99 (-3.88 to -0.10)	SMD: -1.23 (-3.06 to 0.59)	SMD: -0.40 (-0.85 to 0.06)	RR: 0.40 (0.18 to 0.91)
I ² (p)	97% (<.00001)	97% (<.00001)	63% (NR)	66% (NR)

CI: confidence interval; NR: not reported; RR: risk ratio; SMD: standardized mean difference.

Section Summary: Postdural Puncture Headache

One systematic review of 9 RCTs (N=381) compared SPG blocks to various PDPH treatments or sham. The SPG blocks consisted of various lidocaine concentrations (2% to 10%) with some studies combining lidocaine with ropivacaine, dexamethasone, or epinephrine. The primary outcome was the pooled assessment of the pain at various intervals. SPG blocks significantly improved pain compared with controls at 30 minutes, 1 hour, and 4 hours, but not at 2 hours, 6 hours, 8 hours, 12 hours, or 24 hours. The use of rescue treatment was similar between groups. Limitations of the analysis include the variety of anesthetic strengths and combinations used for SPG, the open-label design of the majority of the studies, and the small sample size of the studies.

Injections/Nerve Blocks to the Occipital Nerve for Headache Management

Clinical Context and Therapy Purpose

The purpose of injections/nerve blocks to the occipital nerve for headache management 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 headaches, including but not limited to the treatment of migraines and non-migraine headaches.

Interventions

The therapy being considered is peripheral nerve injections/ nerve blocks.

Peripheral nerve injections/nerve blocks may also be used at various locations around the face and neck (occipital nerve, trigeminal nerve, supraorbital nerve, and stellate ganglion) to reduce pain and inflammation using injectable anesthetic, steroids, or other agents to manage headaches.

Comparators

The following therapies and practices are currently being used to treat headaches including but not limited to migraines and non-migraine headaches: medications, self-management [exercise, relaxation/message], physical therapy, ergonomic modifications, and dietary recommendations).

Outcomes

The general outcomes of interest are reductions in headache frequency, intensity, and medication use. Treatment-related adverse events are minor. A series of injections may be given over several weeks, with follow-up over months to monitor for treatment effect and durability.

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.

Review of Evidence

Systematic Review

In February of 2023, Hayes produced an Evidence Analysis Research Brief on Local Injection Therapy for Cervicogenic Headache and Occipital Neuralgia. According to the brief, which summarized the most recent evidence, there are published studies on local injection therapy for cervicogenic headache and ON. The new evidence consisted of systematic reviews with and without meta-analysis. Furthermore, there were no randomized controlled trials (RCTs), studies evaluating the therapy, or studies evaluating treatment guided by the therapy. Lastly, the brief concluded that there were no position statements or guidelines for the treatment, showing that the lack of available guidance appears to confer with no or unclear support for local injection therapy.

A 2019, last updated in October 2022 Hayes Health Technology Assessment report focused on the efficacy and safety of greater occipital nerve blocks for the preventive treatment of chronic migraine headaches for individuals with an inadequate response to standard care. Hayes provided a C rating indicating there may be a benefit, but it remains unproven because uncertainty remains about the net health outcomes and/or safety due to poor-quality studies, limited data or heterogenous results. Greater occipital nerve blocks with an injection and a corticosteroid of a local anesthetic are relatively safe and may improve most headache outcomes over the short term compared with placebo. There is little to no evidence meeting inclusion criteria supporting the extended of this therapy over a period of time.

Additional, larger and well-designed studies that include longer follow-up on the net health outcomes to determine if the data is accurate for the optimal clinical role of greater occipital nerve blocks in the preventive treatment of chronic migraine. Additionally, comparative effectiveness studies of greater occipital nerve blocks and other therapies, such as on abobotulinumtoxin A are needed. Studies have patient populations heterogeneity in addition to the varying treatment protocols that varies from study to study. The review rating remained low (D²) based on the paucity of evidence on for the use of greater occipital nerve blocks in preventing debilitating symptoms of episodic migraine in individuals who have failed to standard therapy.

Goyal et al (2022) completed a systematic review on the efficacy of interventional treatment strategies for managing individuals with cervicogenic headaches. Based on the inclusion criteria, 23 articles were included. 5 evaluated occipital nerve blocks, all application studies reported a reduction in pain scored and decrease in use of analgesics following GON and CON blocks for the treatment of CeH. One study, Lauretti et al., reported individuals reported a better quality of life for 24 weeks vs. 2 weeks. Evidence is limited with majority of the studies are considered non-controlled and results were transient. Additional studies and more conclusive evidence are indicated.

In a 2022 systematic review with meta-analysis, Velásquez-Rimachi and colleagues evaluated evidence and quality assessment of GONB local anesthetic combined or not with corticosteroids to prevent chronic migraine. The authors measured efficacy by assessing the change from baseline in the intensity and frequency of headaches in the intervention group compared to the placebo at a one-time point. The meta-analysis was performed with random effect models and evaluated random errors with the trial-sequential analysis (TSA), the risk of bias (ROB) with the ROB2 tool, and the certainty of the evidence with Grading of Recommendations, Assessment, Development, and Evaluations (GRADE). The review uncovered 2864 studies that showed GONB reduced the intensity of headaches at the end of the first month (migraine days [MD]: -1.35, 95% CI: -2.12 to -0.59) and the second month (MD: -2.10, CI 95%: -2.94 to -1.26) as well as the frequency of headaches (first month: MD: -4.45 days, 95% CI: -6.56 to -2.34 days; second month: MD: -5.49, 95% CI -8.94 to -2.03 days). Corticosteroids did not show a significant decrease in the frequency of headaches during the first month of treatment (MD: -1.1 days, 95% CI: -4.1 to 1.8, p = .45). Adverse events between the groups were similar, and the exploratory TSA demonstrated inconclusive results. The authors concluded that the limited evidence shows that GONB with local anesthetics can reduce the frequency and intensity of headaches compared to a placebo and adding corticosteroids did not demonstrate any additional benefits. However, the quality of the evidence was deficient because of the substantial ROB and imprecision. Additionally, considering the TSA was inconclusive, more extensive, more specific trials are necessary.

Caponnetto et al (2021) conducted a systematic review to summarize the effectiveness and safety of GONBs in treating cervicogenic headaches. The authors included seven studies, with a total of 140 participants. Unilateral GONBs were reviewed in 5 studies, 4 studies reviewed injection local anesthetic, and 3 studies reviewed steroid and local anesthetic utilization all at various timepoints. Although the pain was reduced from 8.2 (mean) after the first block at 2 weeks to -0.1, 1 month after the 3rd block including one study reporting pain reduced approximately 67% at 3 months studies are limited and heterogeneous. Comparative durability in the reduction in pain over the long-term remains to be determined. Additional larger well designed randomized controlled trials are needed for long term efficacy confirmation, clear injection protocols and patient selection.

In a meta-analysis aimed at evaluating the therapeutic effectiveness of GONB against post-dural puncture headache (PDPH), Chang et al (2021) reviewed seven studies (four RCTs and three non-RCTs) to determine the severity of pain at 24 hours post procedure. Their meta-analysis included 275 adult individuals, A moderate ROB among the non-RCT studies overall was noted. 24-hours post-procedure, the pooled results indicated a lower mean pain score mean difference (“[MD] = -2.66, 95%: CI: -3.98 to -

1.33, $P < .001$; $I^2 = 97\%$, 6 studies”), 1 hour (“MD = -4.23 , 95% confidence interval [CI]: -5.08 to -3.37 , $P < .00001$; $I^2 = 86\%$, 5 studies”), and 6 hours (“MD = -2.78 , 95% CI: -4.99 to -0.57 , $P = .01$; $I^2 = 98\%$, 4 studies”). GONB reduced intervention failure risk (“relative ratio [RR] = 0.4 , 95% CI: 0.19 to 0.82 , $P = .01$; $I^2 = 96\%$, 6 studies, 277 patients”). Limitations noted by the authors included high heterogeneity among the study populations, the difference in treatment provided to the control groups (placebo, bed rest, hydration, oral analgesics), the small number of RCTs available for analysis, and the short-term follow-up of 24 hours. The GONB 24 hours post-procedure may be beneficial in individuals who PDPH with a low risk of intervention failure. The therapeutic benefit of GONB with long term outcomes remains to be determined. Additional larger, well-designed studies are indicated.

Randomized Controlled Trials

In 2024 Chowdhury et al completed a randomized, double-blind study on the greater occipital nerve block of methylprednisolone and lignocaine versus placebo as a transitional preventive treatment for episodic cluster headache in India. There were 39 individuals included in the analysis: 20 in the placebo and 19 in the treatment group. Results were noted as a weekly attack frequency of 10.0 ± 3.5 and 11.8 ± 3.9 , respectively. At the end of week 4, the active treatment group had a greater reduction of 3.4 attacks per week (95% CI: -5.2 to -1.7 , $p < 0.001$) compared with those receiving the placebo. Methodological and relevance limitations of this RCT include that it does not include a US population, has a small sample size, and duration of follow-up was insufficient to demonstrate long-term health outcomes.

In 2023 Chowdhury et al explored the use of greater occipital nerve blockade for preventing chronic migraine with a randomized, double-blind, placebo-controlled study. Individuals received four-weekly bilateral greater occipital nerve blockades with 2 ml of 2% lidocaine (40 mg) (active group $n = 22$) or 2 ml of 0.9% saline (placebo $n = 22$) injections for 12 weeks. In the active group, the average headache and migraine days at baseline ($\pm$ SD) were “ 23.4 ± 4.4 and 15.6 ± 5.7 days and 22.6 ± 5.0 ”. In the placebo group the average headache and migraine days at baseline ($\pm$ SD) were “ 14.6 ± 4.6 days”. The active group had a mean reduction in the number of headaches and migraine days comparatively to the placebo (“ -4.2 days [95% CI: -7.5 to -0.8 ; $p = 0.018$] and -4.7 days [95%CI: 7.7 to 1.7 ; $p = 0.003$], in that order”). Roughly 40.9% of individuals in the active group were able to obtain a $\geq 50\%$ decrease in headache days when compared to those in the placebo group which was 9.1%. There was one less person in the placebo group who reported mild and brief adverse events recorded. There were no reported serious adverse events. Ultimately according to this RCT, four-weekly greater occipital nerve blockade with 2% lidocaine for 12 weeks had a greater effect in decreasing the total headache days when compared to placebo for individuals with chronic migraine. The study did not include those with previous utilization of preventative medication, and 0 individuals were taking preventative medication during the study. Thus, study results generalizability is limited because the patient population is limited and did not include individuals with a history of chronic migraine and have 2-4 preventive treatment failures. More robust trials with longer follow up and a wider patient population are necessary to decide whether to use GONBs in the prevention and reduction chronic migraine headache days.

Malekian et al (2022) conducted a randomized, double-blind, placebo-controlled trial; individuals suffering from episodic migraines without aura were randomized to triamcinolone or lidocaine, triamcinolone plus lidocaine, or saline groups. Evaluations were completed at “baseline, one week, two weeks, and four weeks after the injection. Individuals who were injected with lidocaine alone reported an average decrease of 5.81 headaches per month when “compared with the baseline (95% CI of the difference = -2.52 – -9.09)”. When compared to the baseline, individuals who were injected with both of lidocaine and triamcinolone, the number of headaches were reduced on an “average of 5.69 attacks per month (95% CI of the difference = -1.11 – -10.27)”. For the number of headache days there was a noted downward trend for the Triamcinolone: 20 mg (0.5 ml) of triamcinolone and 2 ml of 0.9% saline group (P -value = 0.266) and Saline solution: 2.5 ml of 0.9% saline solution group (P -value = 0.085), the decreased was still considered statistically insignificant. Although the Lidocaine: 2.0 ml of lidocaine 2% and 0.5 ml of

0.9% saline group and the lidocaine Plus triamcinolone: 20 mg (0.5 ml) of triamcinolone and 2.0 ml of lidocaine 2% group had a reduction in the number of headaches compared to the baseline there was not a significant difference between the groups by the end of the 4th week (P-value = 0.306). Further studies exploring the stability of the results are needed to determine whether these results were caused by the compressive effect of injected solution, or the placebo effect. The therapeutic benefit with long-term outcomes remain to be determined.

Section Summary: Injections/Nerve Blocks to the Occipital Nerve for Headache Management

The published peer reviewed medical literature of peripheral nerve injections/nerve blocks of the occipital nerve to treat headaches consists of randomized controlled trials, systematic reviews, and meta-analysis. Studies had small sample sizes, lacked a sham treatment, alternative therapy, and long-term outcomes. No studies were identified that were adequately powered that have directly evaluated whether using injection therapy/nerve blocks to the supraorbital nerve for headache management improves the health outcomes such as a reduction in in headache frequency, intensity, and medication use thus, there is insufficient evidence to conclude that injection/nerve blocks to the occipital nerve for the treatment of headaches improves the net health outcomes.

Injections/Nerve Blocks to the Supraorbital Nerve for Headache Management

Clinical Context and Therapy Purpose

The purpose of injections/nerve blocks to the supraorbital nerve for headache management 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 headaches, including but not limited to the treatment of migraines and non-migraine headaches.

Interventions

The therapy being considered is peripheral nerve injections/ nerve blocks.

Peripheral nerve injections/nerve blocks may also be used at various locations around the face and neck (occipital nerve, trigeminal nerve, supraorbital nerve, and stellate ganglion) to reduce pain and inflammation using injectable anesthetic, steroids, or other agents to manage headaches.

Comparators

The following therapies and practices are currently being used to treat headaches including but not limited to migraines and non-migraine headaches: medications, self-management [exercise, relaxation/message], physical therapy, ergonomic modifications, and dietary recommendations).

Outcomes

The general outcomes of interest are reductions in headache frequency, intensity, and medication use. Treatment-related adverse events are minor. A series of injections may be given over several weeks, with follow-up over months to monitor for treatment effect and durability.

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.

Review of Evidence

There were no randomized or systematic reviews identified that evaluated the durability of the long term health outcomes in individuals with headaches being treated with injections/nerve blocks to the supraorbital nerve.

Section Summary: Injections/Nerve Blocks to the Supraorbital Nerve for Headache Management

The published peer reviewed medical literature of peripheral nerve injections/nerve blocks to the supraorbital nerve to treat headaches had small sample sizes, lacked a sham treatment, long-term outcomes thus, no studies were identified that were adequately powered that have directly evaluated whether using injection therapy/nerve blocks to the supraorbital nerve for headache management improves the health outcomes such as a reduction in in headache frequency, intensity, and medication use. There is insufficient evidence to conclude that injection/nerve blocks to the stellate ganglion for the treatment of headaches improves the net health outcomes.

Injections/Nerve Blocks to the Stellate Ganglion for Headache Management

Clinical Context and Therapy Purpose

The purpose of injections/nerve blocks to the stellate nerve for headache management 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 headaches, including but not limited to the treatment of migraines and non-migraine headaches.

Interventions

The therapy being considered is peripheral nerve injections/ nerve blocks.

Peripheral nerve injections/nerve blocks may also be used at various locations around the face and neck (occipital nerve, trigeminal nerve, supraorbital nerve, and stellate ganglion) to reduce pain and inflammation using injectable anesthetic, steroids, or other agents to manage headaches.

Comparators

The following therapies and practices are currently being used to treat headaches including but not limited to migraines and non-migraine headaches: medications, self-management [exercise, relaxation/message], physical therapy, ergonomic modifications, and dietary recommendations).

Outcomes

The general outcomes of interest are reductions in headache frequency, intensity, and medication use. Treatment-related adverse events are minor. A series of injections may be given over several weeks, with follow-up over months to monitor for treatment effect and durability.

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.

Review of Evidence

Observational Studies

Yu et al (2023) conducted a retrospective observational study on ultrasound-guided SGB for the treatment of migraines in individuals 65 years and older utilized ultrasound guided stellate ganglion block (SGB) for headaches. 52 were analyzed in this study. The NRS scores reduced after the final SGB (“ $\pm$ standard deviation [SD]) of 7.3 (1.2) at baseline to 3.3 (1.4), 3.1 (1.6), and 3.6 (1.6) at 1, 2, and 3 months, respectively (vs. baseline, $p < 0.001$). There was a reduction if the number of headache days per month from “23.1 (5.5) to 10.9 (7.1) ($p < 0.001$), 12.7 (6.5) ($p = 0.001$), and 14.0 (6.8) days ($p = 0.001$) at the 1-, 2-, and 3-month follow-ups, respectively”. Headache duration was also reduced at “1-month (mean [SD] 12.5 [15.8] h, $p = 0.001$), 2-month (mean [SD] 11.3 [15.9] h, $p = 0.001$), and 3-months (mean [SD] 14.3 [16.0] h, $p = 0.001$) compared to pre-treatment baseline (mean [SD] 22.7 [17.1] h)”. There were 64% individuals who reported a 50% reduction or more in the consumption of medications 3 months after the last SGB treatment. The adverse events connected with SGB were 9.0% and were minor and transient. There were 0 serious AEs. SGB treatment may decrease headache number of headaches per month, pain, and the length of the headache thus decreasing adjunctive medications. Further RCTs exploring the stability of the results are needed.

Hou et al (2022) completed an observational study ultrasound guided SGB for migraines on 81 individuals. Individuals received SGB with 6 ml of 0.15% ropivacaine once every week for four times. Individuals were assessed at baseline and 3-months. Additionally, adjunctive medication was reviewed during the 3 months of the study as well as the NRS score at baseline, day one and three months after treatment. The frequency of medication use in 3 months and the side effects were also recorded at the same time. The NRS score of migraine subjects decreased from 7.0 (2.0) to 3.0 (1.0) at 1-month and 2.0 (2.0) at 3 months (vs baseline, $P < 0.01$). The migraine disability scores at baseline were 14.0 (10.5) and at 3 months or was reduced to 7.0 (4.5) ($P < 0.001$). The rate of analgesic consumption was decreased from 6.2 ± 2.8 to 1.9 ± 1.8 . No serious side effects were reported. This study may suggest that ultrasound-guided SGB is an effective for the treatment of migraines, reducing pain, reported disability, thus improving the AOL. This study has a small sample size and was not randomized. Additional studies should verify this hypothesis.

Section Summary: Injections/Nerve Blocks to the Stellate Ganglion for Headache Management

The published peer reviewed medical literature of peripheral nerve injections/nerve blocks to the stellate ganglion to treat headaches consists of observational studies. Studies had small sample sizes, lacked a sham treatment, alternative therapy, and long-term outcomes. No well-designed studies were identified

that were that have directly evaluated whether using injection therapy/nerve blocks to the supraorbital nerve for headache management improves the health outcomes such as a reduction in in headache frequency and duration, pain intensity, and medication use. There is insufficient evidence to conclude that injection/nerve blocks to the stellate ganglion for the treatment of headaches improves the net health outcomes.

Injections/Nerve Blocks to the Trigeminal Nerve for Headache Management

Clinical Context and Therapy Purpose

The purpose of injections/nerve blocks to the trigeminal nerve for headache management is to provide a treatment option that is an alternative to or an improvement on existing therapies.

Populations

The relevant population of interest is individuals with headaches, including but not limited to the treatment of migraines and non-migraine headaches.

Interventions

The therapy being considered is peripheral nerve injections/ nerve blocks.

Peripheral nerve injections/nerve blocks may also be used at various locations around the face and neck (occipital nerve, trigeminal nerve, supraorbital nerve, and stellate ganglion) to reduce pain and inflammation using injectable anesthetic, steroids, or other agents to manage headaches.

Contraindications to peripheral nerve blocks include known allergy to a local anesthetic, open skull defect, and overlying skin infection; pregnancy is a relative contraindication.

Comparators

The following therapies and practices are currently being used to treat headaches including but not limited to migraines and non-migraine headaches: medications, self-management [exercise, relaxation/message], physical therapy, ergonomic modifications, and dietary recommendations).

Outcomes

The general outcomes of interest are reductions in headache frequency, intensity, and medication use. Treatment-related adverse events are minor. A series of injections may be given over several weeks, with follow-up over months to monitor for treatment effect and durability.

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.

Review of Evidence

We did not identify any studies of injections/nerve blocks to the trigeminal nerve that evaluated any headache outcomes of interest, such as reductions in headache frequency, intensity, and medication use.

Summary of Evidence: Injections/Nerve Blocks to the Trigeminal Nerve for Headache Management

The published peer reviewed medical literature of peripheral nerve injections/nerve blocks to the trigeminal nerve to treat headaches does not consist of RCTs or systematic reviews. No studies were identified that have directly evaluated whether using injection therapy/nerve blocks to the trigeminal nerve for headache management improves the health outcomes such as a reduction in headache frequency, pain intensity, and medication use, there is insufficient evidence to conclude that injection/nerve blocks to the stellate ganglion for the treatment of headaches improves the net health outcomes.

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.

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.

American Academy of Pain Medicine

The American Academy of Pain Medicine (2021) conducted a systematic review to develop practice recommendations for use of percutaneous interventional strategies for the preventive treatment of migraine.

- Sphenopalatine ganglion blocks received a weak recommendation for chronic migraine prevention based on a very low certainty of evidence. The only therapy evaluated in the guideline that received a strong recommendation for chronic migraine prevention was onabotulinumtoxinA.
- The committee gave a weak recommendation in opposition of using steroids and LA vs. LA alone for GONBs for reducing HA days per month, acute medication use per month, and impairment.
- GONBs received a weak recommendation for their use for chronic migraine prevention. For GONB, steroid received a weak recommendation against its use vs the use of local anesthetic alone.
- Occipital nerve with supraorbital nerve blocks, sphenopalatine ganglion blocks received weak recommendations for their use for chronic migraine prevention.
- The committee found insufficient evidence to assess trigger point injections in migraine prevention and highly discouraged the use of intrathecal medication.

American Headache Society

The American Headache Society guideline (ADH; 2016) on the treatment of cluster headache includes subcutaneous sumatriptan, zolmitriptan nasal spray, and high flow oxygen as Level A (established as effective) acute treatment recommendations. Sphenopalatine ganglion stimulation is rated as a Level B (probably effective) acute treatment recommendation. However, the recommendation for sphenopalatine ganglion stimulation was based on a single randomized controlled trial that evaluated an implanted, on-demand, acute electrical stimulation device of the SPG, rather than a catheter device used to apply local anesthetic. There are no Level A recommendations for reducing the frequency of cluster headaches in the guideline.

The American Headache Society provided a position statement on Integrating New Migraine Treatments into Clinical Practice in December of 2018. However, the guidelines do not mention the utilization of injection therapy for headache management.

European Headache Society

In 2019, the European Headache Foundation issued an update to the Aides to Management of Headache in Primary Care. This document reports a greater occipital nerve block using various agents may be used as a transition therapy for cluster headaches.

Multi-society International Working Group

A multi-society international working group with U.S representation published clinical practice guidelines on postdural puncture headache (PDPH) management. The guidelines state that "Evidence does not support routine use of SPGBs [sphenopalatine ganglion blocks] to treat PDPH". This was a Grade I level recommendation with a low level of certainty.

Ongoing and Unpublished Clinical Trials

Some currently ongoing and unpublished trials that might influence this review can be located at clinicaltrials.gov.

REFERENCES

1. American Society of Health System Pharmacists; AHFS Drug Information 2009. Bethesda, MD. (2009), p. 3334
2. Levin M. Nerve blocks in the treatment of headache. *Neurotherapeutics*, 7(2): 197-203 2010.
3. Bogduk N. Role of anesthesiologic blockade in headache management. *Curr Pain Headache Rep*, 8(5): 399-403 2004.
4. Tian Medical Inc. Use of the Tx360 Nasal Applicator in the Treatment of Chronic Migraine ClinicalTrials.gov [Internet]. Bethesda (MD): National Library of Medicine (US). 2012 [November 13, 2013].
5. International Headache Society. The International Classification of Headache Disorders, 2nd edition May, 2005. Web site.
6. Krusz JC. Aggressive interventional treatment of intractable headaches in the clinic setting. *Clinics in Family Practice*, 7(3)2005.
7. Khan, S; Schoenen, J; Ashina, M. "Sphenopalatine ganglion neuromodulation in migraine: What is the rationale?" *Cephalalgia* 2014;34(5):382–391
8. *Journal of Headache and Pain* 2013, 14:86 doi:10.1186/1129-2377-14-86
9. Schoenen, J; Jensen, RH; Lantéri-Minet, M; Láinez, MJ; Gaul, C; Goodman, AM; Caparso, A; May, A. "Stimulation of the sphenopalatine ganglion (SPG) for cluster headache treatment. Pathway CH-1: a randomized, sham-controlled study." *Cephalalgia*. 2013 Jul;33(10):816-30. PMID 23314784
10. Khan, S; Schoenen, J; Ashina, M. "Sphenopalatine ganglion neuromodulation in migraine: What is the rationale?" *Cephalalgia* 2014;34(5):382–391.
11. Martelletti, P; Jensen, RH; Antal, A; Arcioni, R; Brighina, F' de Tommaso, M; Franzini, A; Fontaine, D; Heiland, M; Jürgens, TP; Leone, M; Magis, D; Paemeleire, K; Palmisani, S;

- Paulus, W; May, A. "Neuromodulation of chronic headaches: position statement from the European Headache Federation." *J Headache Pain* 2013;14(1):86.
12. Piagkou, M; Demesticha, T; Troupis, T; Vlasis, K; Skandalakis, P; Makri, A; Mazarakis, A; Lappas, D; Piagkos, G; Johnson, EO. "The pterygopalatine ganglion and its role in various pain syndromes: from anatomy to clinical practice." *Pain Pract.* 2012;12(5):399-412.
 13. Roger Cady, Joel Saper, Kent Dexter and Heather R. Manley A Double-Blind, Placebo-Controlled Study of Repetitive Transnasal Sphenopalatine Ganglion Blockade With Tx360® as Acute Treatment for Chronic Migraine Headache: *The Journal of Head and Face Pain* 55 Article first published online: 23 OCT 2014 | DOI: 10.1111/head.12458
 14. Zarembinski C, Graff-Radford S. An Unusual Challenge in Performing Sphenopalatine Ganglion Block with Enlarged Coronoid Process: Jacob's Disease. *Pain Med.* 2014 Feb;15(2):329-32.
 15. Practice Guidelines for Chronic Pain Management. An Updated Report by the American Society of Anesthesiologists Task Force on Chronic Pain Management and the American Society of Regional Anesthesia and Pain Medicine. *Anesthesiology* 2010; 112:1–1.
 16. American Migraine Foundation. Sphenopalatine Ganglion Blocks in Headache Disorders. 2016. <https://americanmigrainefoundation.org/resource-library/sphenopalatine-ganglion-blocks/>. Accessed December 31, 2025.
 17. American Academy of Neurological Surgeons (AANS). Occipital Neuralgia. November 2006. Updated 2013.
 18. Blumenfeld A, Ashkenazi A, Napchan U, et al. Expert consensus recommendations for the performance of peripheral nerve blocks for headaches—a narrative review. *Headache.* 2013; 53(3): 437 – 446.
 19. Cho SJ, Song TJ, Chu MK. Treatment update of chronic migraine. *Curr Pain Headache Rep.* 2017;21(6):26.
 20. Ambrosini A, Schoenen J. Invasive pericranial nerve interventions. *Cephalalgia.* 2016 Mar 22 [Epub ahead of print].
 21. Mehta, D. , Leary, M. C., Yacoub, H. A., El-Hunjul, M. , Kincaid, H. , Koss, V. , Wachter, K. Malizia, D. , Glassman, B. and Castaldo, J. E. (2018), The Effect of Regional Anesthetic Sphenopalatine Ganglion Block on Self-Reported Pain in Patients With Status Migrainosus. *Headache: The Journal of Head and Face Pain.* . doi:10.1111/head.13390
 22. Puledra F, Goadsby PJ, Prabhakar P. Treatment of disabling headache with greater occipital nerve injections in a large population of childhood and adolescent patients: a service evaluation. *The Journal of Headache and Pain.* 2018;19(1):5. Doi:10.1186/s10194-018-0835-5.
 23. Pringsheim, T., Davenport, W. J., Marmura, M. J., Schwedt, T. J. and Silberstein, S. (2016), How to Apply the AHS Evidence Assessment of the Acute Treatment of Migraine in Adults to your Patient with Migraine. *Headache*, 56: 1194–1200. Doi:10.1111/head.12870
 24. Tobin J, Flitman S. Occipital nerve blocks: when and what to inject? *Headache.* 2009 Nov-Dec; 49(10):1521-33.
 25. (2019), The American Headache Society Position Statement On Integrating New Migraine Treatments Into Clinical Practice. *Headache: The Journal of Head and Face Pain*, 59: 1-18. <https://doi.org/10.1111/head.13456>. Accessed December 31, 2025.

26. Brauser, D. AHS Releases Updated Guidance on Migraine Treatment. Medscape Medical News. January 10, 2019. <https://www.medscape.com/viewarticle/907493> Accessed December 31, 2025.
27. Krebs, K, Rorden, C, and Androulakis, XM. Resting State Functional Connectivity After Sphenopalatine Ganglion Blocks in Chronic Migraine With Medication Overuse Headache: A Pilot Longitudinal fMRI Study. *Headache*. 2018;58(5):732-743
28. Binfalah M, Alghawi E, Shosha E, Alhilly A, Bakhiet M. Sphenopalatine ganglion block for the treatment of acute migraine headache. *Pain Research and Treatment*. 2018;2018:2516953. Doi:10.1155/2018/2516953
29. Gupta, R., Fisher, K. & Pyati, S. Chronic Headache: a Review of Interventional Treatment Strategies in Headache Management. *Curr Pain Headache Rep* 23, 68 (2019).
30. Slullitel A, Santos IS, Machado FC, Sousa AM. Transnasal sphenopalatine nerve block for patients with headaches. *Journal of clinical anesthesia*. 2018;47:80-81. Doi:10.1016/j.jclinane.2018.03.025.
31. Crespi J, Bratbak D, Dodick D, et al. Measurement and implications of the distance between the sphenopalatine ganglion and nasal mucosa: a neuroimaging study. *J Headache Pain* 2018; 19:14
32. Barad M, Ailani J, Hakim SM, et al. Percutaneous Interventional Strategies for Migraine Prevention: A Systematic Review and Practice Guideline. *Pain Med*. Aug 11 2021. PMID 34382092
33. Plewa MC, McAllister RK. Postdural Puncture Headache (PDPH). In: StatPearls. Treasure Island (FL): StatPearls Publishing; August 23, 2020. PMID 28613675
34. Jespersen MS, Jaeger P, Aegidius KL, et al. Sphenopalatine ganglion block for the treatment of postdural puncture headache: a randomized, blinded, clinical trial. *Br J Anaesth*. Jun 2020; 124(6): 739-747. PMID 32303377
35. International Association for the Study of Pain (IASP). Global year against headache. <https://www.iasp-pain.org/advocacy/global-year/headache/>. Accessed December 31, 2025.
36. Singh A, Soares WE. Management strategies for acute headache in the emergency department. *Emerg Med Pract*. Jun 2012; 14(6): 1-23; quiz 23-4. PMID 22830180
37. Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition. *Cephalalgia*. Jan 2018; 38(1): 1-211. PMID 29368949
38. Berger CW, Crosby ET, Grodecki W. North American survey of the management of dural puncture occurring during labour epidural analgesia. *Can J Anaesth*. Feb 1998; 45(2): 110-4. PMID 9512843
39. Sanders M, Zuurmond WW. Efficacy of sphenopalatine ganglion blockade in 66 patients suffering from cluster headache: a 12- to 70-month follow-up evaluation. *J Neurosurg*. Dec 1997; 87(6): 876-80. PMID 9384398
40. Cady R, Saper J, Dexter K, et al. A double-blind, placebo-controlled study of repetitive transnasal sphenopalatine ganglion blockade with tx360((R)) as acute treatment for chronic migraine. *Headache*. Jan 2015; 55(1): 101-16. PMID 25338927
41. Cady RK, Saper J, Dexter K, et al. Long-term efficacy of a double-blind, placebo-controlled, randomized study for repetitive sphenopalatine blockade with bupivacaine vs.

- saline with the Tx360 device for treatment of chronic migraine. *Headache*. Apr 2015; 55(4): 529-42. PMID 25828648
42. Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders: 2nd edition. *Cephalalgia*. 2004; 24 Suppl 1: 9-160. PMID 14979299
 43. Schaffer JT, Hunter BR, Ball KM, et al. Noninvasive sphenopalatine ganglion block for acute headache in the emergency department: a randomized placebo-controlled trial. *Ann Emerg Med*. May 2015; 65(5): 503-10. PMID 25577713
 44. Pipolo C, Bussone G, Leone M, et al. Sphenopalatine endoscopic ganglion block in cluster headache: a reevaluation of the procedure after 5 years. *Neurol Sci*. Jun 2010; 31 Suppl 1: S197-9. PMID 20464621
 45. Felisati G, Arnone F, Lozza P, et al. Sphenopalatine endoscopic ganglion block: a revision of a traditional technique for cluster headache. *Laryngoscope*. Aug 2006; 116(8): 1447-50. PMID 16885751
 46. Seebacher J, Ribeiro V, LeGuillou JL, et al. Epidural blood patch in the treatment of post dural puncture headache: a double blind study. *Headache*. Nov 1989; 29(10): 630-2. PMID 2693404
 47. Sandesc D, Lupei MI, Sirbu C, et al. Conventional treatment or epidural blood patch for the treatment of different etiologies of post dural puncture headache. *Acta Anaesthesiol Belg*. 2005; 56(3): 265-9. PMID 16265829
 48. van Kooten F, Oedit R, Bakker SL, et al. Epidural blood patch in post dural puncture headache: a randomised, observer-blind, controlled clinical trial. *J Neurol Neurosurg Psychiatry*. May 2008; 79(5): 553-8. PMID 17635971
 49. Bigal ME, Lipton RB. The epidemiology, burden, and comorbidities of migraine. *Neurol Clin*. May 2009; 27(2): 321-34. PMID 19289218
 50. Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition. *Cephalalgia*. Jan 2018; 38(1): 1-211. PMID 29368949
 51. Omranifard M, Abdali H, Ardakani MR, et al. A comparison of outcome of medical and surgical treatment of migraine headache: In 1 year follow-up. *Adv Biomed Res*. 2016; 5: 121. PMID 27563631
 52. Loder E, Weizenbaum E, Frishberg B, et al. Choosing wisely in headache medicine: the American Headache Society's list of five things physicians and patients should question. *Headache*. 2013; 53(10): 1651-9. PMID 24266337
 53. Cesmebasi A, Muhleman MA, Hulsberg P, et al. Occipital neuralgia: anatomic considerations. *Clin Anat*. 2015;28(1):101-108. doi:[10.1002/ca.22468](https://doi.org/10.1002/ca.22468) Accessed December 31, 2025.
 54. Choi I, Jeon SR. Neuralgias of the head: occipital neuralgia. *J Korean Med Sci*. 2016;31(4):479-488. doi:[10.3346/jkms.2016.31.4.479](https://doi.org/10.3346/jkms.2016.31.4.479) Accessed December 31, 2025.
 55. Cohen S, Levin D, Mellender S, et al. Topical Sphenopalatine Ganglion Block Compared With Epidural Blood Patch for Postdural Puncture Headache Management in Postpartum Patients: A Retrospective Review. *Reg Anesth Pain Med*. 2018 Nov;43(8):880-884. doi: 10.1097/AAP.0000000000000840. PMID: 30063655.

56. Kent S, Mehaffey G. Transnasal sphenopalatine ganglion block for the treatment of postdural puncture headache in obstetric patients. *J Clin Anesth.* 2016 Nov;34:194-6. doi: 10.1016/j.jclinane.2016.04.009. Epub 2016 May 11. PMID: 27687372.
57. Dach F, Eckeli AL, Ferreira Kdos S, Speciali JG. Nerve block for the treatment of headaches and cranial neuralgias – a practical approach. *Headache.* 2015;55 Suppl 1:59-71. doi:[10.1111/head.12516](https://doi.org/10.1111/head.12516) Accessed December 31, 2025.
58. Demont A, Lafrance S, Benaissa L, Mawet J. Cervicogenic headache, an easy diagnosis? A systematic review and meta-analysis of diagnostic studies. *Musculoskelet Sci Pract.* 2022;62:102640. doi:[10.1016/j.msksp.2022.102640](https://doi.org/10.1016/j.msksp.2022.102640) Accessed December 31, 2025.
59. Karadas O, Ozturk B, Ulas UH, Kutukcu Y, Odabasi Z. The efficacy of botulinum toxin in patients with cervicogenic headache: a placebo-controlled clinical trial. *Balkan Med J.* 2012;29(2):184-187. doi:[10.5152/balkanmedj.2012.003](https://doi.org/10.5152/balkanmedj.2012.003) Accessed December 31, 2025.
60. Sjaastad O, Bakketeig LS. Prevalence of cervicogenic headache: Vågå study of headache epidemiology. *Acta Neurol Scand.* 2008;117(3):173-180. doi:[10.1111/j.1600-0404.2007.00962.x](https://doi.org/10.1111/j.1600-0404.2007.00962.x) Accessed December 31, 2025.
61. Vincent MB. Headache and neck. *Current Pain and Headache Reports.* 2011;15(4):324-331. doi:[10.1007/s11916-011-0195-1](https://doi.org/10.1007/s11916-011-0195-1) Accessed December 31, 2025.
62. Voigt CL, Murphy MO. Occipital nerve blocks in the treatment of headaches: safety and efficacy. *J Emerg Med.* 2015;48(1):115-129. doi:[10.1016/j.jemermed.2014.09.007](https://doi.org/10.1016/j.jemermed.2014.09.007) Accessed December 31, 2025.
63. Wang E, Wang D. Treatment of cervicogenic headache with cervical epidural steroid injection. *Curr Pain Headache Rep.* 2014;18(9):442. doi:[10.1007/s11916-014-0442-3](https://doi.org/10.1007/s11916-014-0442-3) Accessed December 31, 2025.
64. Goyal S, Kumar A, Mishra P, Goyal D. Efficacy of interventional treatment strategies for managing patients with cervicogenic headache: a systematic review. *Korean J Anesthesiol.* 2022;75(1):12-24. doi:10.4097/kja.21328
65. Hazewinkel MHJ, Bink T, Hundepool CA, Duraku LS, Zuidam JM. Nonsurgical treatment of neuralgia and cervicogenic headache: a systematic review and meta-analysis. *Plast Reconstr Surg Glob Open.* 2022;10(7):e4412. doi:10.1097/gox.0000000000004412
66. He MW, Ni JX, Guo YN, et al. Continuous epidural block of the cervical vertebrae for cervicogenic headache. *Chin Med J (Engl)* 2009;122:427–30.
67. Malekian N, Bastani PB, Oveisgharan S, et al. Preventive effect of greater occipital nerve block on patients with episodic migraine: a randomized double-blind placebo-controlled clinical trial. *Cephalalgia.* 2022 May;42(6):481-489.
68. Chowdhury D, Tomar A, Deorari V, et al. Greater occipital nerve blockade for the preventive treatment of chronic migraine: a randomized double-blind placebo-controlled study. *Cephalalgia.* 2023 Feb;43(2):3331024221143541.
69. Friedman BW, Irizarry E, Williams A, et al. A randomized, double-dummy, emergency department-based study of greater occipital nerve block with bupivacaine vs intravenous metoclopramide for treatment of migraine. *Headache.* 2020 Nov;60(10):2380-2388.
70. Korucu O, Dagar S, Corbacioglu SK, et al. The effectiveness of greater occipital nerve blockade in treating acute migrainerelated headaches in emergency departments. *Acta Neurol Scand.* 2018 Sep;138(3):212-218.

71. Cuadrado ML, Aledo-Serrano Á, Navarro P, et al. Short-term effects of greater occipital nerve blocks in chronic migraine: a double-blind, randomized, placebo-controlled clinical trial. *Cephalalgia*. 2017;37(9):864-872.
72. Gul HL, Ozon AO, Karadas O, et al. The efficacy of greater occipital nerve blockade in chronic migraine: a placebo-controlled study. *Acta Neurol Scand*. 2017;136(2):138-144.
73. Palamar Deniz, Uluduz Derya, Saip Sabahattin, et al. Ultrasound-guided greater occipital nerve block: an efficient technique in chronic refractory migraine without aura? *Pain Physician* 2015; 18:153-162.
74. Kashipazha D, Nakhostin-Mortazavi A, Mohammadianinejad SE, et al. Preventive effect of greater occipital nerve block on severity and frequency of migraine headache. *Glob J Health Sci*. 2014 Jul 29;6(6):209-13.
75. Hazewinkel, M. H. J., Bink, T., Hundepool, C. A., Duraku, L. S., & Zuidam, J. M. (2022). Nonsurgical Treatment of Neuralgia and Cervicogenic Headache: A Systematic Review and Meta-analysis. *Plastic and reconstructive surgery. Global open*, 10(7), e4412. <https://doi.org/10.1097/GOX.0000000000004412> Accessed December 31, 2025.
76. Hasırcı Bayır BR, Gürsoy G, Sayman C, et al. Greater occipital nerve block is an effective treatment method for primary headaches? *Agri*. 2022 Jan;34(1):47-53.
77. Velásquez-Rimachi V, Chachaima-Mar J, Cárdenas-Baltazar EC, et al. Greater occipital nerve block for chronic migraine patients: a meta-analysis. *Acta Neurol Scand*. 2022 Aug;146(2):101-114.
78. Caponnetto V, Ornello R, Frattale I, et al. Efficacy and safety of greater occipital nerve block for the treatment of cervicogenic headache: a systematic review. *Expert Rev Neurother*. 2021 May;21(5):591-597.
79. Chang YJ, Hung KC, Chen IW, et al. Efficacy of greater occipital nerve block for pain relief in patients with postdural puncture headache: A meta-analysis. *Medicine (Baltimore)*. 2021 Dec 23;100(51):e28438.
80. Shauly O, Gould DJ, Sahai-Srivastava S, et al. Greater occipital nerve block for the treatment of chronic migraine headaches: a systematic review and meta-analysis. *Plast Reconstr Surg*. 2019 Oct;144(4):943-952.
81. Özer D, Bölük C, Türk Börü Ü, et al. Greater occipital and supraorbital nerve blockade for the preventive treatment of migraine: a single-blind, randomized, placebo-controlled study. *Curr Med Res Opin*. 2019 May;35(5):909-915.
82. Tang Y, Kang J, Zhang Y, et al. Influence of greater occipital nerve block on pain severity in migraine patients: a systematic review and meta-analysis. *Am J Emerg Med*. 2017 Nov;35(11):1750-1754.
83. Yang Y, Song M, Fan Y, et al. Occipital nerve stimulation for migraine: a systematic review. *Pain Pract*. 2016 Apr;16(4):509-17.
84. Dilli E, Halker R, Vargas B, et al. Occipital nerve block for the short-term preventive treatment of migraine: a randomized, double-blinded, placebo-controlled study. *Cephalalgia*. 2014 Dec 12.
85. Niraj G, Kelkar A, Girotra V. Greater occipital nerve block for postdural puncture headache (PDPH): a prospective audit of a modified guideline for the management of PDPH and review of the literature. *J Clin Anesth*. 2014 Nov;26(7):539-44.

86. Govindappagari S, Grossman TB, Dayal AK, et al. Peripheral nerve blocks in the treatment of migraine in pregnancy. *Obstet Gynecol.* 2014 Dec;124(6):1169-74.
87. Guerrero ÁL, Herrero-Velázquez S, Peñas ML, et al. Peripheral nerve blocks: a therapeutic alternative for hemicrania continua. *Cephalalgia.* 2012 Apr;32(6):505-8
88. Wahab, S., Kataria, S., Woolley, P., et al. (2023). Literature Review: Pericranial Nerve Blocks for Chronic Migraines. *Health psychology research*, 11, 74259. <https://doi.org/10.52965/001c.74259> Accessed December 31, 2025.
89. Yu B., Hou S., Xing Y., et al. Ultrasound-guided stellate ganglion block for the treatment of migraine in elderly patients: A retrospective and observational study. June 14, 2023. *Headache The Journal of head and Face Pain.* Volume 63, Issue 6. Pages 763-770. <https://doi.org/10.1111/head.14537> Accessed December 31, 2025.
90. Moon S, Lee J, Jeon Y. Bilateral stellate ganglion block for migraine: a case report. *Medicine.* 2020;99:18 (e20023).
91. Hou, J., Pu, S., Xu, X., et al. 2022. Real-time ultrasound-guided stellate ganglion block for migraine: an observational study. *BMC anesthesiology*, 22(1), 78. <https://doi.org/10.1186/s12871-022-01622-8> Accessed December 31, 2025.
92. Jacques N, Karoutsos S, Marais L, Nathan-Denizot N. Quality of life after trigeminal nerve block in refractory trigeminal neuralgia: A retrospective cohort study and literature review. *J Int Med Res.* 2022 Oct;50(10):3000605221132027.
93. Seo HJ, Park CK, Choi MK, Ryu J, Park BJ. Clinical Outcome of Percutaneous Trigeminal Nerve Block in Elderly Patients in Outpatient Clinics. *J Korean Neurosurg Soc.* 2020 Nov;63(6):814-820.
94. Naja ZM, El-Rajab M, Al-Tannir MA, Ziade FM, Tawfik OM. Occipital nerve blockade for cervicogenic headache: a double-blind randomized controlled clinical trial. *Pain Pract.* 2006;6:89–95.
95. Inan N, Ceyhan A, Inan L, Kavaklioglu O, Alptekin A, Unal N. C2/C3 nerve blocks and greater occipital nerve block in cervicogenic headache treatment. *Funct Neurol.* 2001;16:239–43.
96. Lauretti GR, Corrêa SW, Mattos AL. Efficacy of the greater occipital nerve block for cervicogenic headache: comparing classical and subcompartmental techniques. *Pain Pract.* 2015;15:654–61.
97. Pingree MJ, Sole JS, O' Brien TG, Eldrige JS, Moeschler SM. Clinical efficacy of an ultrasound-guided greater occipital nerve block at the level of C2. *Reg Anesth Pain Med.* 2017;42:99–104.
98. Ertem DH, Yilmaz I. The effects of repetitive greater occipital nerve blocks on cervicogenic headache. *Turk J Neurol.* 2019;25:82–6.
99. Lambru G, Abu Bakar N, Stahlhut L, McCulloch S, Miller S, Shanahan P, Matharu MS. Greater occipital nerve blocks in chronic cluster headache: a prospective open-label study. *Eur J Neurol.* 2014 Feb;21(2):338-43. doi: 10.1111/ene.12321. Epub 2013 Dec 7. PMID: 24313966.
100. Dwivedi P, Singh P, Patel TK, et al. Trans-nasal sphenopalatine ganglion block for post-dural puncture headache management: a meta-analysis of randomized trials. *Braz J Anesthesiol.* Jul 06 2023. PMID 37422191

101. Robbins MS, Starling AJ, Pringsheim TM, et al. Treatment of Cluster Headache: The American Headache Society Evidence-Based Guidelines. *Headache*. Jul 2016; 56(7): 1093-106. PMID 27432623
102. Beithon J, Gallenberg M, Johnson K, et al & Institute for Clinical Systems Improvement, issuing body. (2013). *Diagnosis and treatment of headache : health care guideline* (Eleventh edition.). Institute for Clinical Systems Improvement.
https://www.icsi.org/_asset/qwrznq/Headache.pdf Accessed December 31, 2025..
103. Han KR, Chae YJ, Lee JD, et al. Trigeminal nerve block with alcohol for medically intractable classic trigeminal neuralgia: long-term clinical effectiveness on pain. *Int J Med Sci*. 2017 Jan 1;14(1):29-36. doi: 10.7150/ijms.16964. PMID: 28138306; PMCID: PMC5278656.
104. Han KR, Kim C, Chae YJ, Kim DW. Efficacy and safety of high concentration lidocaine for trigeminal nerve block in patients with trigeminal neuralgia. *Int J Clin Pract*. 2008 Feb;62(2):248-54. doi: 10.1111/j.1742-1241.2007.01568.x. Epub 2007 Nov 23. PMID: 18036166.
105. Steiner TJ, Jensen R, Katsarava Z, et al. Aids to management of headache disorders in primary care (2nd edition) : on behalf of the European Headache Federation and Lifting The Burden: the Global Campaign against Headache. *J Headache Pain*. 2019 May 21;20(1):57. doi: 10.1186/s10194-018-0899-2. PMID: 31113373; PMCID: PMC6734476.
106. Agency for Healthcare Research and Quality. Comparative Effectiveness Review Number 247. "Interventional Treatments for Acute and Chronic Pain" Systematic Review. Available at: <https://effectivehealthcare.ahrq.gov/products/interventional-treatments-pain/research> Accessed December 2025.
107. Agency for Healthcare Research and Quality. Systematic Review on Acute Treatment for Episodic Migraine Surveillance. Literature Update Period: July 2020 through September 2021. Available at: <https://pubmed.ncbi.nlm.nih.gov/36893298/>. Accessed December 2025.
108. Uppal V, Russell R, Sondekoppam RV, et al. Evidence-based clinical practice guidelines on postdural puncture headache: a consensus report from a multisociety international working group. *Reg Anesth Pain Med*. Jul 08, 2024; 49(7): 471-501. PMID 37582578
109. UpToDate. Garza I., Schwedt T., Robertson CE. et al. Chronic Migraine. Review current through November 2025. Last updated October 2024. Available at: www.uptodate.com. Accessed December 2025.
110. UpToDate. Garza I., Schwedt T., Swanson J.W., et al. Chronic daily headache: Associated syndromes, evaluation, and management. Review current through November 2025. Last updated October 2024. Available at: www.uptodate.com. Accessed December 2025.
111. UpToDate. Schwedt T.J., Garza I., Swanson J.W., et al. Acute Treatment of Migraine in Adults. Review current through November 2025. Last updated December 2025. Also available at <https://www.uptodate.com>. Accessed December 2025
112. UpToDate. Bateman B.T. Cole N., Sun-Edelstein C., Post Dural Puncture Headache. Last updated September 2024. Review current through November 2025. Available at <https://www.uptodate.com>. Accessed December 2025.
113. UpToDate, Inc. Taylor F.R., Swanson J.W., Goddeau R.P., Tension-type headache in adults: preventive treatment. Review current through November 2025. Last Updated July 2024. Available at: www.uptodate.com. Accessed December 2025.

114. Hayes, a symplr company. Evidence Analysis Research Brief. Local Injection Therapy for Cervicogenic Headache and Occipital Neuralgia. Hayes, a symplr company. February 2, 2023. Available at: www.hayesinc.com. Accessed December 2025.
115. Hayes, a symplr company. Health Technology Assessment. Local Injection Therapy for Cervicogenic Headache and Occipital Neuralgia. Hayes, a symplr company. September 28, 2017. Annual Review November 15, 2021. Available at: www.hayesinc.com. Accessed December 2025.
116. Hayes, a symplr company. Health Technology Assessment. Greater Occipital Nerve Blocks for Treatment of Migraine. Hayes, a symplr company. Available on September 5, 2019. Updated October 10, 2022. Available at: www.hayesinc.com. Accessed December 2025.
117. Hayes, a symplr company. Evidence Analysis Research Brief. Sphenopalatine Ganglion Block for Treatment of Occipital Neuralgia. Hayes, a symplr company. August 9, 2024. Available at: www.hayesinc.com. Accessed December 2025.
118. World Health Organization. Migraine and other headache disorders. <https://www.who.int/news-room/fact-sheets/detail/headache-disorders>. Accessed December 31, 2026.

CODES

To report provider services, use appropriate CPT codes, HCPCS codes, Revenue codes, and/or ICD diagnosis codes.

Codes	Number	Description
CPT		
	30999	Unlisted procedure, nose
	64400	Injection(s), anesthetic agent(s) and/or steroid; trigeminal nerve, each branch (i.e., ophthalmic, maxillary, mandibular)
	64405	Injection(s), anesthetic agent(s) and/or steroid; greater occipital nerve
	64505	Injection, anesthetic agent, sphenopalatine ganglion
	64510	Injection, anesthetic agent; stellate ganglion (cervical sympathetic)
	64999	Unlisted procedure, nervous system
	64450	Injection, anesthetic agent and/or steroid; other peripheral nerve or branch
HCPCS		
	No code(s)	

Type of Service	Surgery	
Place of Service	Outpatient	

POLICY HISTORY

Date	Reason	Action
January 2026	Annual Review	Policy Revised
January 2025	Annual Review	Policy Revised
January 2024	Annual Review	Policy Revised
February 2023	Annual Review	Policy Revised
July 2023	Annual Review	Policy Revised
July 2022	Annual Review	Policy Revised
July 2021	Annual Review	Policy Revised
July 2020	Annual Review	Policy Renewed
July 2019	Annual Review	Policy Revised
August 2018	Annual Review	Policy Revised
August 2017	Annual Review	Policy Revised
August 2016	Annual Review	Policy Revised
September 2015	Annual Review	Policy Revised
October 2014	Annual Review	Policy Renewed
December 2013	Annual Review	New Policy

New information or technology that would be relevant for Wellmark to consider when this policy is next reviewed may be submitted to:

Wellmark Blue Cross and Blue Shield
 Medical Policy Analyst
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