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via Email: A.Policy@PalmettoGBA.com

Part A Policy
Palmetto PO Box 100238
AG-275
Columbia, SC 29202

Dear Medical Directors,

On behalf of the American Academy of Pain Medicine (AAPM), representing more than 2,500 multidisciplinary clinicians dedicated to improving the lives of patients with acute and chronic pain, we appreciate the opportunity to comment on the proposed Local Coverage Determination (LCD) for *Peripheral Nerve Blocks and Procedures for Chronic Pain*. We are providing you with two documents: 1) this letter and AAPM's response to the proposed LCD; 2) a detailed commentary organized by procedural type, supporting literature, and patient stories in response to each procedure named in the LCD; this document is the result of input from over thirty pain medicine experts and AAPM volunteers.

Chronic pain is a complex, disabling disease that affects more than 51 million U.S. adults (one in five Americans) and limits daily function for over 17 million. It is linked with depression, cognitive decline, suicide, and substantial economic burden. Recognizing this, both the U.S. Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC) have emphasized the urgent need for equitable access to comprehensive, multidisciplinary, and non-opioid pain management. The CDC's 2022 *Clinical Practice Guideline for Prescribing Opioids for Pain* specifically encourages a multimodal approach that integrates interventional, pharmacologic, behavioral, and rehabilitative strategies as best practice for effective and equitable pain care.

AAPM shares these priorities. Our members, representing anesthesiology, neurology, physiatry, primary care, psychiatry, nursing, and other disciplines, are deeply committed to advancing evidence-based, patient-centered pain management. Peripheral nerve blocks and the procedures for chronic pain as discussed in the proposed LCD determination are a cornerstone of this care. They serve diagnostic, prognostic, and therapeutic roles that guide appropriate treatment planning, reduce reliance on opioids, and improve function and quality of life. Major specialty societies, including the American Headache Society and the European Academy of Neurology, recognize the clinical value of nerve blocks for refractory headache, occipital neuralgia, neuropathic pain, and other chronic pain conditions. These procedures are well established in contemporary practice, providing a safe, reversible, and cost-effective means to reduce suffering and avoid higher-risk or irreversible interventions.

While AAPM supports CMS’s goal of grounding coverage policy in robust evidence, we are concerned that the proposed LCD’s reliance on GRADE methodology misrepresents the strength and relevance of the existing literature. GRADE is a valuable framework for assessing pharmacologic interventions, where uniform protocols and double-blind designs are feasible. However, when applied to interventional pain procedures, its rigid criteria can distort interpretation. Procedural studies often involve diverse patient populations, variable anatomical targets with specific procedural requirements, variable technical and training expertise specific to the performing interventionalist, and multidimensional outcomes, including pain relief, function, opioid reduction, and quality of life, which cannot be uniformly captured by GRADE’s metrics.

Moreover, randomized, double-blind, placebo-controlled trials favored within GRADE are frequently impractical or unethical in this setting. As a result, high-quality observational and pragmatic studies, case series, and real-world data, which form the foundation of interventional pain medicine, are systematically undervalued. This does not mean that such interventions lack efficacy; rather, it reflects the inherent methodological challenges of studying individualized procedures.

AAPM respectfully urges CMS to recognize that “low” or “moderate” evidence ratings under GRADE do not imply ineffectiveness but instead signify uncertainty that must be interpreted alongside clinical expertise and patient outcomes. The integration of both scientific rigor and specialist judgment is essential to ensure that coverage determinations reflect the realities of patient care and the intent of national policy to promote safe, effective, and opioid-sparing pain management.

Clinical Evidence and Outcomes

A robust body of clinical and real-world evidence supports the use of peripheral nerve blocks as essential components of comprehensive pain care. These procedures play diagnostic, prognostic, and therapeutic roles that enable targeted treatment, improved functional outcomes, and reduced reliance on opioid therapy (Cohen, Vase, and Hooten 2021; Hu et al. 2024; Fletcher et al. 2021; Swarm et al. 2025). Their benefits are well documented across a range of pain conditions, including neuropathic pain, post-surgical pain, complex regional pain syndrome, and refractory headache disorders.

Conservative measures alone, such as pharmacologic therapy, exercise, or behavioral interventions, often provide incomplete relief. Meta-analyses and systematic reviews (Busse et al. 2018; Finnerup et al. 2015) have shown that medications frequently used for chronic pain offer only modest benefit, with high numbers needed to treat (NNTs) ranging from 6 to 11. Econometric analyses examining the cost of interventional procedures versus medication costs demonstrate cost savings. In contrast to medications and other treatments, interventional procedures performed by board-certified and trained pain specialists can deliver meaningful reductions in pain intensity, facilitate physical rehabilitation, and restore quality of life for patients who have exhausted conservative care.

Peripheral nerve blocks also have critical diagnostic and prognostic value. Short-acting diagnostic blocks can help confirm the pain generator and guide next-step treatments such as radiofrequency ablation, neuromodulation, or surgery, thereby reducing the likelihood of

unnecessary or ineffective interventions. Denying coverage for these procedures would effectively remove a key tool that allows clinicians to tailor therapy and limit patient exposure to opioids and invasive operations.

Additionally, there is clear evidence that access to interventional pain care correlates with decreased opioid prescribing demonstrated that patients managed with interventional approaches experienced lower rates of opioid initiation and dose escalation compared with those treated solely with medical therapy. This aligns directly with national health objectives outlined in the CDC 2022 Guideline and the HHS *Pain Management Best Practices Inter-Agency Task Force Report*, both of which explicitly call for expanded access to non-opioid, multimodal pain care, including peripheral nerve blocks.

From a cost-effectiveness standpoint, peripheral nerve blocks are also a prudent use of Medicare resources. By improving pain control, these procedures can prevent more expensive downstream costs associated with emergency department visits, hospitalizations, prolonged rehabilitation, or chronic opioid therapy. For example, peripheral nerve interventions such as genicular nerve ablation for osteoarthritis of the knee has been shown to be cost-effective relative to repeated corticosteroid injections or surgical referral (Kanjapanang et al. 2025; Chen et al. 2021). Similarly, nerve blocks for occipital neuralgia and other headache disorders can restore function and reduce the need for expensive imaging studies, procedures, and medications.

Collectively, these data demonstrate that peripheral nerve blocks are not experimental or investigational. They are evidence-informed, guideline-supported, and essential to patient-centered pain management. Limiting access to these interventions would reverse decades of progress in reducing opioid dependence, improving function, and advancing equitable pain care.

AAPM therefore urges CMS to maintain coverage for diagnostic, prognostic, and therapeutic peripheral nerve blocks and to align its policies with contemporary clinical evidence, specialty consensus, and the federal government's stated goal of expanding safe, effective, non-opioid options for individuals living with chronic pain.

Conclusion and Policy Recommendations

The American Academy of Pain Medicine (AAPM) strongly supports the responsible stewardship of Medicare resources and evidence-based standards for patient care. However, the proposed LCD on *Peripheral Nerve Blocks and Procedures for Chronic Pain* does not align with the weight of clinical evidence, the guidance of major federal agencies, national and international professional societies, or the principles of patient-centered pain management.

Eliminating coverage and/or severely limiting access for these procedures would have profound consequences for millions of Americans living with chronic pain. Patients with recalcitrant pain who have already exhausted conservative therapies would be left with few viable options other than opioids or possibly irreversible surgical interventions. Such a policy would increase suffering, impair function, and ultimately raise overall health care costs by driving reliance on higher-risk, higher-cost treatments, and avoidable emergency utilization.

Conversely, maintaining access to numerous peripheral nerve blocks, radiofrequency, and cryoablation procedures supports the very outcomes Medicare seeks to promote: improved

quality of life, reduced opioid dependence, and decreased downstream utilization. These procedures are safe, reversible, and cost-effective. Please see our attached detailed response to each procedural type addressed in this proposed LCD. Their use is consistent with the CDC's 2022 *Clinical Practice Guideline for Prescribing Opioids for Pain*, the HHS *Pain Management Best Practices Inter-Agency Report*, and the clinical recommendations of major specialty societies including the American Headache Society, the European Academy of Neurology, and others.

AAPM respectfully urges CMS and the MACs to withdraw the proposed LCD in its current form and to collaborate with pain medicine specialists in revising the policy. A revised LCD should:

1. **Acknowledge the established** diagnostic, prognostic, and therapeutic roles of peripheral nerve blocks and ablative procedures in multidisciplinary pain management.
2. **Incorporate appropriate evidence appraisal methods** that reflect the realities of procedural research and real-world clinical practice.
3. **Ensure equitable patient access** to non-opioid, multimodal pain care consistent with national pain strategy goals.
4. **Engage specialty expertise** from AAPM and related professional societies to inform policy refinement and implementation and ensure technical and procedural safety measures are followed.

AAPM stands ready to assist CMS in developing a balanced, scientifically grounded, and patient-centered policy framework. We believe there is common ground upon which to formulate a better coverage policy; one that identifies optimal patients for peripheral nerve block therapy and has standards for treatment efficacy and/ outcomes. In doing so, we can be good stewards of health care resources yet allow appropriate access to these vital treatments.

Together, we can ensure that Medicare beneficiaries continue to receive compassionate, effective, and evidence-informed pain care that reduces suffering, restores function, and advances the shared national goal of minimizing reliance on opioids while improving health and quality of life.

Sincerely,



Antje M. Barreveld, MD
President, AAPM
abarreveld@bwh.harvard.edu



James Babington, MD
Chair, AAPM Policy Committee
james.babington@swedish.org

References:

Busse, Jason W., Li Wang, Mostafa Kamaleldin, Samantha Craigie, John J. Riva, Luis Montoya, Sohail M. Mulla, et al. 2018. "Opioids for Chronic Noncancer Pain: A Systematic Review and Meta-Analysis." *JAMA* 320 (23): 2448–60.

Chen, Bo, Jingrui Duan, Shengyue Wen, Jian Pang, Min Zhang, Hongsheng Zhan, and Yuxin Zheng. 2021. "An Updated Systematic Review and Meta-Analysis of Duloxetine for Knee Osteoarthritis Pain." *The Clinical Journal of Pain* 37 (11): 852–62.

Cohen, Steven P., Lene Vase, and William M. Hooten. 2021. "Chronic Pain: An Update on Burden, Best Practices, and New Advances." *Lancet (London, England)* 397 (10289): 2082–97.

Dowell D, Ragan KR, Jones CM, Baldwin GT, Chou R 2022. "CDC Clinical Practice Guideline for Prescribing Opioids for Pain - United States, 2022." *MMWR Recomm Rep* 4;71(3):1-95.

Finnerup, Nanna B., Nadine Attal, Simon Haroutounian, Ewan McNicol, Ralf Baron, Robert H. Dworkin, Ian Gilron, et al. 2015. "Pharmacotherapy for Neuropathic Pain in Adults: A Systematic Review and Meta-Analysis." *The Lancet. Neurology* 14 (2): 162–73.

Fletcher, Austin, Kelli J. Moore, James D. Stensby, Anna Hulbert, Arash M. Saemi, Ryan M. Davis, and Ambarish P. Bhat. 2021. "The Pain Crisis: Interventional Radiology's Role in Pain Management." *AJR. American Journal of Roentgenology* 217 (3): 676–90.

HHS 2022 Pain Management Best Practices Inter-Agency Task Force Report:
<https://www.hhs.gov/opioids/prevention/pain-management-options/index.html>

Hu, Xianghong, Dahao Chenyang, Bin Xu, Yangjun Lao, Hongfeng Sheng, Shuliang Zhang, and Yuliang Huang. 2024. "Pericapsular Nerve Group Block Reduces Opioid Use and Pain after Hip Surgery: A Systematic Review and Meta-Analysis of Randomized Controlled Trials." *PloS One* 19 (11): e0310008.

Kanjanapanang, Napatpaphan, Roy Madrid, Peter Lin, Mark Shilling, Amanda Cooper, Hasan Sen, Sherwin Thiyagarajan, et al. 2025. "Effectiveness of Genicular Nerve Radiofrequency Ablation in Osteoarthritis and Post-Surgical Knee Pain: Systematic Review." *Pain Medicine (Malden, Mass.)*, August. <https://doi.org/10.1093/pm/pnaf115>.

Swarm, Robert A., Jeanie M. Youngwerth, Julia L. Agne, Magdalena Anitescu, Madhuri Are, Sorin Buga, Taylor Butler, et al. 2025. "Adult Cancer Pain, Version 2.2025, NCCN Clinical Practice Guidelines In Oncology." *Journal of the National Comprehensive Cancer Network : JNCCN* 23 (7). <https://doi.org/10.6004/jnccn.2025.0032>.

American Academy of Pain Medicine
Response to the Proposed Local Coverage Determination for Peripheral Nerve Blocks and Procedures for Chronic Pain – by Procedure Type

Occipital Nerve Blocks and Radiofrequency Denervation:

Overall conclusions:

Occipital nerve blocks provide immediate and clinically significant pain relief. Radiofrequency ablation provides low certainty evidence for longer term relief. Despite the published literature's low certainty conclusions, clinical experience demonstrates significant improvement in patient function, reduction in opioid use, and this procedure serves as a potent adjunct to medicine management.

Relevant literature:

Occipital nerve blocks can produce immediate and significant pain relief,(Mustafa et al. 2024) and in the Emergency Room (ER) setting, these nerve blocks are superior to infusion of medications used to ameliorate migraine episodes.(Friedman et al. 2015) A recent systematic review and meta-analysis reported that greater occipital nerve blocks in chronic migraine patients significantly reduced headache pain intensity and medication consumption without an increase in adverse events. Not only are occipital nerve blocks effective for acute and preventive treatment of primary headache disorders but they can be effective for medication overuse headache syndromes, helping to facilitate reduction of overused analgesics.(Koonalintip et al. 2025) In fact, one prospective analysis of occipital nerve blocks for occipital neuralgia found that aside from improved pain scores, analgesic medication requirements dropped from 100% of patients' pre-block to only 16.7% post-block, indicating a dramatic reduction in dependence on pain medications after the intervention. Repeated blocks have been demonstrated to be effective in randomized controlled trials.(Chowdhury, Datta, and Mundra 2021) Importantly, in older adults, peripheral nerve blocks were effective in 73% of all headaches and 60% in occipital neuralgia with no adverse events reported. This represents an opportunity to reduce medication overuse and avoidance of medications with known high side effect burden for geriatric patients.(Hascalovici and Robbins 2017) Additionally, the International Headache Society Migraine Guidelines recommend nerve blocks as a first line treatment in pregnancy.(Puleda et al. 2024) If relief is temporary with the occipital nerve blocks, pulsed radiofrequency ablation (PRF) can provide a more sustained response in refractory cases.(Ertlav and Aydın 2024)

Patient/clinical experience:

As a mother of three children, a 28-year-old Wisconsinite was forced to confine herself to her dark bedroom on most days of the month. She had been to the ER 38 times in the last year, where she received infusions and opioids to alleviate her pain. She had been to the Diamond Headache clinic and had been through two university “multidisciplinary” inpatient rehab programs in Madison and Milwaukee. She eventually saw a neurologist who performed weekly

occipital blocks, first to wean her off acute analgesics, and eventually to decrease ER and hospital visits. After a series of 9 nerve blocks she was off opioids and other abortive medications, she underwent a pulsed radiofrequency procedure and is currently experiencing fewer than 5 episodes a month, all managed without opioids. She is now three years into this treatment approach and doing extremely well.

Stellate Ganglion Block

Overall Conclusions:

The stellate ganglion block (SGB) is an important interventional pain procedure as it modulates sympathetic nervous system activity in the head, neck, thorax, and arms. Classically, it has been effective in treating micro-vascular insufficiency, recalcitrant neuropathic (Complex Regional Pain Syndrome - CRPS I, II), and nociceptive pain conditions. Because the autonomic nervous system exerts extensive influence across multiple organ systems, it affords an opportunity in several non-pain applications, including life threatening disorders and disease states. SGB has been successfully utilized in Post-Traumatic Stress Disorder (PTSD), Postural Orthostatic Tachycardia Syndrome (POTS), menopausal vasomotor symptoms, long COVID, and in fact SGB is a core component of treatment protocols of life-threatening cerebral ischemia and refractory tachyarrhythmias. Thus, the non-coverage of SGB, will have far broader consequences than is readily appreciated by the MAC committee members who drafted this LCD proposal. For your consideration, in the following paragraphs we point out the core literature highlights that seem to have been overlooked, or misinterpreted in the proposed LCD.

Relevant literature:

The most recent high-quality evidence for SGB to treat complex regional pain syndrome comes from Tian et al, and was cited in the proposed LCD.(Tian et al. 2024) This systematic review and meta-analysis found that SGB therapy resulted in statistically significant reduction in pain intensity compared to controls, with a weighted mean difference of -6.24 mm (95% CI, -11.45 to -1.03; $P = 0.019$) in visual analog scale pain scores. This is a clinically relevant improvement in pain. While it is true that the Cochrane Database of Systematic Reviews updated review by O'Connell et al. concluded that there is a lack of high quality evidence to support or refute the use of local anesthetic sympathetic blockade for CRPS, it is important to note that the Cochrane overview of systematic reviews by Ferrero et al on interventions for treating pain and disability in adults with CRPS was unable to identify any high-certainty evidence for the effectiveness of any therapy for CRPS.(O'Connell et al. 2016; Ferraro et al. 2023) This underscores the difficulty of executing large, high-quality trials for such a heterogeneous disease state like CRPS and the importance of continued support for clinical research into interventional treatments. CRPS prevalence is increasing with increased recognition of the disease, and is associated with chronic pain, disability, higher opioid and benzodiazepine use, hospitalizations, and lost productivity.(Elsamadicy et al. 2018) Stellate ganglion blocks are an important part of the multimodal treatment plan for CRPS. In addition, stellate ganglion blocks have prognostic capabilities for predicting response to additional treatments for CRPS including ketamine infusions.(Cohen et al. 2023)

The proposed LCD cited research by Wang et al, which showed that ultrasound guided SGB combined with extracorporeal shock wave therapy decreases pain and Pain Disability Index for patients with craniofacial postherpetic neuralgia.(Wang et al. 2022) Similarly, a recent RCT by Zheng et al showed that SGB alone or combined with trioxygen autologous blood retransfusion therapy decreased pain scores and anxiety in patients with postherpetic neuralgia.(Zheng et al. 2025) There is promising research that pro-active treatment of acute herpetic pain can prevent or reduce the incidence and severity of postherpetic neuralgia. Makharita et al performed an RCT of 64 patients with acute herpes zoster of the face comparing fluoroscopic guided SGB with bupivacaine and dexamethasone versus saline. Duration of acute pain and incidence of postherpetic neuralgia at 3 months was decreased in the SGB group.(Makharita, Amr, and El-Bayoumy 2012) Taken together, these studies and many others support the use of stellate ganglion block to prevent and treat craniofacial post-herpetic neuralgia.

The proposed LCD cited research by Rae Olmsted et al, which showed that stellate ganglion block reduced PTSD symptom severity at 8 weeks compared to sham injections.(Rae Olmsted et al. 2020) This therapeutic effect was consistent across secondary outcomes and sites, and adverse events were mild and transient. Blakey et al performed a secondary analysis collected from a previous RCT of SGB compared to sham injection to treat PTSD, and found that arousal and reactivity cluster symptoms (hypervigilance, startle responses, sleep disturbances, concentration issues) showed the greatest reductions in severity.(Blakey et al. 2024) Many studies, including a retrospective cohort study of 484 consecutive cases of PTSD in Chicago, demonstrate improvements in PTSD checklist score version DSM IV after SGB. Of particular interest are those studies that show a greater improvement in PTSD symptoms after SGB for patients with military backgrounds compared to civilians.(Lipov et al. 2022) More research is needed into SGB therapy for our veterans with military related trauma.

The stellate ganglion block is used to treat diseases with wide patient variability in terms of disease severity, duration of disease at intervention, and symptom distribution, which makes powering studies difficult. At this point, our best evidence comes from smaller RCT's, pragmatic trials, retrospective analysis rather than large RCT's - though the cumulative clinical experience overall supports SGB efficacy in treating CRPS, post-herpetic neuralgia, and PTSD. This fact will be undervalued using the GRADE algorithm without acknowledging the cumulative clinical experience which overall supports SGB efficacy in treating CRPS, post-herpetic neuralgia, and PTSD. This calls attention to a clinical need for multicenter collaboration across tertiary care centers and smaller hospitals to rigorously study the benefits of SGB and advance our scientific knowledge.

Regarding the CMS proposed LCD, we advise maintaining SGB coverage for diagnosis and treatment of sympathetically mediated pain conditions including but not limited to CRPS, craniofacial post-herpetic neuralgia, and PTSD. The stellate ganglion block is used to treat diseases with wide patient variability in terms of disease severity, duration of disease at intervention, and symptom distribution, which makes powering studies difficult.

Patient/clinical experience:

Sarah is a 30-year-old professional chef with CRPS in the left hand after an accidental thumb injury. Her pain has persisted for 6 months, and physical therapy was impossible due to pain. At one point, she was offered and agreed to amputation of her forearm. A series of stellate blocks allowed her to go through desensitization therapy, followed by a rehabilitation program, and she eventually returned to normal function.

Trigeminal Nerve Blocks and Trigeminal Neuralgia

Overall conclusions:

Trigeminal nerve blocks (TNBs) are safe, effective, and essential tools in the diagnosis and management of trigeminal neuralgia (TN)—a devastating facial pain disorder often referred to as “suicide pain.” Although evidence certainty is moderate due to procedural heterogeneity, consistent clinical findings demonstrate meaningful, sometimes long-lasting pain relief and improved function. These procedures are vital non-opioid options that reduce reliance on systemic medications, including opioids, and support recovery in patients suffering from one of the most disabling pain syndromes in medicine.

Relevant literature:

TNBs provide clinically significant relief with reported durations ranging from weeks to years.(Meier et al. 2025; Han et al. 2008; Radwan, Saito, and Goto 2001) They also serve as “bridge” therapy for providing relief, while systemic medications are optimized or while patients await definitive surgery.(Nader et al. 2013; Perloff and Chung 2018)

TNBs and related interventions play a crucial role in reducing opioid reliance. Clinical data and real-world experience demonstrate decreased opioid initiation and escalation when interventional procedures are integrated early.(Jacques et al. 2022) By restoring the ability to eat, speak, and engage in daily activities, these procedures enable patients to taper or discontinue opioid therapy—directly supporting the CDC 2022 Guideline and HHS Pain Management Best Practices emphasizing multimodal, non-opioid pain care.

TNBs are generally considered safe and well-tolerated. Studies cited in the proposed LCD(Elsheikh and Amr 2016; Balta and Köknel Talu 2021) report minimal adverse effects, and a recent randomized controlled trial of image-guided TNBs found no serious undesirable outcomes.(Meier et al. 2025) The proposed LCD incorrectly references complications from a large retrospective study of trigeminal radiofrequency ablation (Kanpolat et al. 2001) as if they applied to nerve blocks. This conflation misrepresents the true safety profile of TNBs, which have not been shown to cause these adverse effects.

Long-established percutaneous procedures such as glycerol rhizotomy and balloon compression have decades of evidence supporting durable benefit, with long-term success rates between 75–98% (L. Chen, Xu, and Zou 2010; Taha and Tew 2000; Bick and Eskandar 2017; Noorani et al.

2016; Nascimento, Pipek, and de Aguiar 2023; Asplund, Blomstedt, and Bergenheim 2016) Arbitrary six-month waiting periods before procedural care and restrictive anesthesia limitations are inconsistent with accepted clinical practice and risk worsening pain, malnutrition, and opioid dependence.

Concerns regarding inclusion conditions for RF ablation:

1. Six-month waiting period: A mandated six-month duration before surgical therapy is clinically inappropriate. Many patients are unable to eat or speak due to pain and experience significant weight loss despite optimized medical therapy. Delaying care prolongs suffering and increases risk of opioid dependence.
2. “Not a good surgical candidate” requirement: RF ablation is itself a surgical procedure. The language suggesting patients must “decline” or be “unsuitable” for surgery is inaccurate and should be removed. Procedure selection should rely on shared decision-making between physician and patient, based on comorbidities, imaging findings, and risk tolerance.
3. Diagnostic nerve block prerequisite: There is no peer-reviewed evidence that a TNB differentiates TN from other facial pain disorders or predicts response to surgery. This requirement is unsupported, inconsistent with the LCD’s own statements, and would create unnecessary barriers to timely care.

Anesthesia considerations:

The LCD’s statement that moderate or deep sedation, general anesthesia, or monitored anesthesia care (MAC) is “rarely indicated” is inaccurate. Trigeminal RF and glycerol rhizotomies cause significant procedural pain and are universally performed under MAC or general anesthesia. Percutaneous balloon compression rhizotomy is almost always performed under general anesthesia. These practices reflect standard clinical safety and should remain covered at the treating physician’s discretion.

Patient/clinical experience:

Patients with TN often endure diagnostic delays, medication side effects, and profound functional decline. TNBs provide stabilization and symptom relief that enable further treatment planning. For example, a 66-year-old man with severe right-sided facial pain refractory to carbamazepine, gabapentin, baclofen, and opioids experienced six weeks of near-complete relief after a fluoroscopy-guided TNB. This period allowed safe surgical planning and successful microvascular decompression, leading to sustained pain relief and discontinuation of opioids and sedating medications.

Suprascapular Nerve Block

Overall conclusions:

Chronic shoulder pain is one of the most common pain syndromes worldwide.(Otuka et al. 2025) The incidence of chronic shoulder pain varies from 6.7 to 17.3 per 1000 person-years.(Djade et al. 2020) The suprascapular nerve provides approximately 70% of the sensory innervation to the shoulder joint.(Batten et al. 2023) Suprascapular nerve block (SSNB) and ablation are minimally invasive, low-risk, percutaneous procedures that are routinely employed to treat chronic shoulder pain due to inflammatory arthritis, rheumatoid arthritis, adhesive capsulitis, rotator cuff tendonitis, bursitis, degenerative disease as well as postoperative and post-stroke chronic shoulder pain.(Gado and Emery 1993; Schoenherr, Flynn, and Doyal 2023; E. M. Shanahan et al. 2003) SSNB is used as a diagnostic nerve block as a precursor for radiofrequency ablation. It is a valuable diagnostic tool to differentiate shoulder pain from cervical radiculopathy or cervical facet mediated pain.

Relevant literature:

A meta-analysis evaluated the efficacy of SSNB or pulsed radiofrequency ablation on patient reported outcomes. The mean improvement in pain was >50% which is considered significant relief for any intervention in patients suffering from chronic pain (SMD 2.37 (95% CI 1.66, 3.07)).(Batten et al. 2023) Another meta-analysis demonstrated the superiority of SSNB to placebo and physical therapy for treatment of chronic shoulder pain.(Chang et al. 2016) An RCT reported superior patient-reported outcomes with addition of SSNB to standard rehabilitative therapy in patients suffering from rotator cuff tendinitis.(Di Lorenzo et al. 2006) Improvements in chronic shoulder pain and adhesive capsulitis pain scores, along with an enhanced range of motion in patients receiving SSNB compared to placebo group, were reported in another RCT.(E. Michael Shanahan et al. 2022) In a recent meta-analysis of level I trials, SSNB provided greater pain relief along with greater improvements in shoulder function and range of motion at 12 weeks compared to intra-articular corticosteroid injections.(Harley et al. 2025) RFA of suprascapular nerve along with axillary and lateral pectoral nerves has shown long term significant improvements in pain, functional activities of daily living, and range of motion of the shoulder for at least 6 months.(Yoshida, Park, and Thang 2025)

Medication options for chronic shoulder pain are limited to Non-Steroidal Anti-inflammatory medications (NSAIDs) and opioids. The LCD quotes a study with a complication rate of 4% for SSNB (most of which are low risk events such as local pain at injection site and bruising). In comparison, NSAIDs and opioids cause more frequent and significant harm. In a systematic review of trials on patients taking oral opioids for chronic pain, authors reported >50% patients suffered from at least one side effect of opioids.(Moore and McQuay 2005) Opioid induced respiratory depression, dependence, and addiction are dangerous side effects which not only affect the individual patient but have far reaching consequences for society. NSAIDs have many serious adverse effects, can lead to bleeding, kidney damage, increased risk of heart attacks and most of the time are not an option for older patients. In comparison, SSNB is safer and when completed by qualified pain specialists, a minuscule incidence of severe complications was

described in harm-focused reviews (Chan and Peng 2011; Annison et al. 2025; E. Michael Shanahan et al. 2022)

Options for pain relief are limited for chronic pain in an aging population with co-morbidities. SSNB has roles in diagnostic localization to help elucidate pain origin, provide pain relief to allow for adequate physical rehabilitation, and is a less-invasive option in a stepwise approach for pain mitigation. It is an invaluable tool to improve quality of life and patient-reported outcomes for patients who are poor candidates for surgery. The proposed LCD would eliminate an evidence-based, lower-risk tool that frequently serves to aid rehabilitation and diminish opioid use along with contradicting Medicare's aims of decreasing adverse events, improving function, and fostering conservative care where applicable. Deprivation of safeguarding specialist judgment for well-documented indications (such as use in a multimodal approach, failed more conservative measures) poses a significant risk in the accessibility of this evidence-supported tool and the individualized treatment and management of chronic pain. AAPM strongly advocates for maintaining SSNB coverage when preceding conservative methods are trialed and accepted indications are met.

Patient/clinical experience:

JS is an 82-year-old patient who has osteoarthritis of her right shoulder and left knee. She was referred for severe left knee and right shoulder arthralgias, which were only transiently responsive to corticosteroid injections, hylan injections, and not adequately responsive to physical therapy and home exercises. Medications such as celecoxib, diclofenac gel, and acetaminophen provided inadequate relief. Because of her multiple co-morbidities, she wished to defer surgical replacement of joints. She has been receiving right suprascapular and left genicular denervation once a year. Both these procedures have improved her quality of life substantially (as noted below) without opioid medications.

Direct quotes from our patient:

"I am 82 years old with 2 new hips and one new knee. My remaining natural knee and my right shoulder are a source of constant pain. Needless to say - more implants are not appealing."

"Shoulder and knee denervations have enabled me to move freely and enjoy my life. I can sleep without pain, walk my dog and swim ½ mile daily. The procedures are relatively quick - relief is very quick."

"Living without pain and having freedom of movement without lengthy rehab after surgeries is invaluable."

Thoracic (Intercostal) Nerve Block; Thoracic (Intercostal) Denervation

Overall conclusions:

Thoracic (intercostal) nerve blocks, along with denervation, are procedures often used for patients suffering from intractable neuropathic pain refractory to medications. ("[No Title]," n.d.-a; Abd-Elseyed, Lee, and Jackson 2018) Intercostal nerve blocks have value in diagnosing and treating several chronic pain conditions including intercostal neuralgia after rib fractures or in slipping rib syndrome, postherpetic neuralgia (PHN), and post-surgical pain syndromes, most

notably post-mastectomy and post-thoracotomy pain syndromes.(Elkhashab and Wang 2021; DesRochers et al. 2024) These pain conditions are common in the aging population. The lifetime prevalence of herpes zoster, for example, is 50% by the age of 80 years with 5-15% of these patients suffering from PHN.(Aggarwal et al. 2020) Similarly, post-thoracotomy syndrome is common and affects up to 50% of the patients undergoing thoracic surgery.(Shanthanna et al. 2016) Post-mastectomy pain is also common, affecting 20-68% of patients after mastectomy.(DesRochers et al. 2024) Of the neuropathic conditions which are treated by intercostal and other nerve blocks covered by the proposed LCD, only PHN has medications with a specific FDA approval (lidocaine patch 5%), often with limited efficacy.

Relevant literature:

There is evidence to show the effectiveness of intercostal nerve block, and radiofrequency (RFA) or cryoablation for treating acute and chronic neuropathic pain in the chest wall and abdominal wall. Intercostal nerve blocks are used for diagnostic as well as therapeutic purposes and are commonly administered to treat acute pain in the perioperative period and in patients suffering from rib fractures. In a randomized clinical trial including 450 patients undergoing thoracoscopic lung resection, a single-shot intercostal nerve block was noninferior to thoracic epidural analgesia for pain control. The nerve block was superior for less nausea and vomiting and significantly reduced opioid consumption along with length of stay in the hospital.(Spaans et al. 2025) The pain relief from a single injection can be of limited duration and hence repeat injections or ablation procedures are utilized for sustained pain relief for chronic pain conditions. Both thermal and cooled radiofrequency ablation have been shown to treat resistant intercostal neuralgia effectively in case series.(Fiala et al. 2023; Abd-Elsayed, Lee, and Jackson 2018) Cryoablation has been successfully used to treat pain in patients suffering from post-thoracotomy pain syndrome.(Byas-Smith and Gulati 2006) In a double-blind Randomized Control Trial (RCT) comparing pulsed RFA (PRF) vs sham under fluoroscopy guidance in patients suffering from PHN, the PRF group had lower pain scores that lasted for 6 months after treatment ($P < 0.05$) and lower tramadol requirements within the first month after treatment ($P < 0.05$). Quality of life measurement with the SF-36 score (including physical functioning, physical role, bodily pain, general health perceptions, social function, emotional role, and mental health index) was significantly improved until 6 months after treatment in the PRF group compared to the sham group ($P < 0.01-0.05$). There were no pneumothoracies, bleeding complications, infections, or other severe side effects in either group ($P > 0.05$) indicating safety of this procedure.(Ke et al. 2013) Similar results with improved pain control in ultrasound guided PRF group were reported in another double blind RCT comparing PRF vs sham in patients with PHN.(Makharita et al. 2018) In a meta-analysis of 15 studies with 1817 patients, authors reported PRF combined with pregabalin significantly reduced the pain scores in patients PHN [$P < .00001$, standardized mean difference (SMD) = -2.01, confidence intervals (CI) = -2.36 to -1.66; $P < .00001$, SMD = -0.69, CI = -0.77 to -0.61].(J. Chen et al. 2023) Cryoneurolysis has been shown to reduce post-mastectomy pain in sham controlled perioperative studies.(Ilfeld et al. 2022) In this study of 60 subjects, those who had received active cryoneurolysis ($n = 31$) had a median pain score of 0 [0 to 1.4] versus 3.0 [2.0 to 5.0] in patients given sham ($n = 29$): difference -2.5 (97.5% CI, -3.5 to -1.5), $P < 0.001$. There was evidence of superior analgesia through month 12. During the first 3 weeks, cryoneurolysis lowered cumulative opioid use by 98%, with the active group using 1.5 [0 to 14] mg of oxycodone compared with 72 [20 to 120] mg in the sham group ($P < 0.001$). After

1 yr chronic pain had developed in 1 (3%) active compared with 5 (17%) sham participants ($P < 0.001$).

The LCD quotes a single study with serious methodological flaws.(Hacıbeyoğlu et al. 2020) This study is a retrospective review with inherent limitations, including reliance on past data, which can be incomplete or inaccurate, leading to potential biases like selection and recall bias. More importantly, the intercostal blocks were done without any imaging guidance, thus the risk of procedural failure to block the intended target is high. In the United States, image guidance with either fluoroscopy or ultrasound is used to improve accuracy and safety compared to landmark (blind) technique.(Tascón Padrón et al. 2025; Elkhatab and Wang 2021) Furthermore, the study did not document the number of levels performed for intercostal nerve block, so inadequate block is highly likely due to overlap innervations between adjacent dermatomes. Moreover, placing 2 ml of solution without any imaging guidance is not adequate for a single level intercostal nerve block. Even with these technical weaknesses, the pain relief in the intercostal group was significantly lower than baseline and in the range of clinically meaningful differences at week 4 and week 12. Given the significant methodological flaws and misleading conclusions of the cited study, it should not be used as a benchmark for determining coverage decisions for thoracic nerve blocks. Denying patients' access to care based on such a flawed single study is unjustifiable.

Patient/clinical experience:

Thoracic neuropathic pain remains an exceptionally difficult condition to manage. Substantial evidence supports the use of intercostal nerve blocks and pulsed radiofrequency treatment for patients suffering from intractable thoracic nerve pain, both for effective pain relief and for reducing opioid consumption—a critical goal in the context of the ongoing opioid crisis. The LCD recommends gabapentinoids, serotonin-norepinephrine reuptake inhibitors, and topical analgesics as first- and second-line therapies for these conditions, with strong opioids reserved as third-line options. However, aside from postherpetic neuralgia (PHN), none of these conditions have medications with FDA-approved indications. Opioid use in neuropathic pain is particularly concerning as it rarely provides effective pain relief in such conditions.

A 67-year-old woman with rheumatoid arthritis on chronic steroids with severe osteoporosis and multiple fractures including rib fractures and high pain make it difficult for her to breathe. She is on high-dose opioids for chronic pain and was frequently hospitalized for pain. Intercostal nerve blocks have made it possible for her to avoid hospitalizations.

Genicular Nerve Block; Genicular Nerve Cryoneurolysis and Denervation

Overall conclusion:

Genicular nerve radiofrequency ablation (GNRFA) is a non-opioid, minimally invasive therapy for the treatment of knee pain that has been shown to reduce pain, improve function, and decrease the need for analgesics, including opioids. Multiple studies demonstrate that successful GNRFA is associated with reduced analgesic use (Santana-Pineda et al. 2021; Wong et al. 2021; Tate et al. 2022; Guven Kose et al. 2023) and improvements in EQ-5D (A. F. Chen et al. 2020b,

2020a) and WOMAC scores (El-Hakeim et al. 2018; Sari et al. 2018), whereas untreated moderate-to-severe Knee Osteoarthritis (KOA) is linked to increased opioid use, particularly among older adults with impaired mobility.(Jackson et al. 2020) Removing coverage for this procedure would directly contradict Medicare’s efforts to combat the opioid epidemic. CMS has consistently promoted non-opioid pain management, and delisting a safe, effective, and durable alternative would represent a significant policy misalignment.

Furthermore, removing coverage for GNRFA would effectively eliminate one of the few viable interventional options for managing residual, chronic pain following TKA, a condition affecting 10–20% of patients, many of whom are elderly, frail, or ineligible for revision surgery. GNRFA is both efficacious and safe.(Choi et al. 2011; McCormick et al. 2018; Sari et al. 2018; Davis et al. 2018, 2019; C. Hunter et al. 2020; A. F. Chen et al. 2020b, 2020a; Santana-Pineda et al. 2021; Makkar et al. 2024; Das et al. 2025; Lyman et al. 2022) Adverse events are uncommon and generally minor, typically limited to transient discomfort, with no significant safety concerns reported across more than 30 studies encompassing thousands of procedures.(Ajrawat et al. 2020)

Relevant literature:

The most rigorous and current systematic review presented moderate-certainty evidence supporting the effectiveness of GNRFA for KOA.(Kanjapanang et al. 2025) Across 28 studies, 51% of patients receiving GNRFA achieved $\geq 50\%$ pain relief at six months and 58% at twenty-four months. Additionally, 69% reported clinically meaningful pain relief, defined as a ≥ 2 -point reduction on NRS, at six months. These findings demonstrate a robust, durable, and clinically meaningful benefit, with parallel improvements in function, quality of life, and patient global assessment across studies. Furthermore, this review found that techniques generating large lesions demonstrated higher pooled success rates compared to small lesions at 12 months [55% (95% CI: 51%-59%) vs 34% (95% CI: 26%-43%)], highlighting the importance of stratifying study results by critical technical considerations.

Further support for these findings comes from two recent high-quality RCTs (Das et al. 2025; Makkar et al. 2024) published after the Kanjanapanang review period. Makkar et al. conducted a well-designed RCT, which similarly demonstrated significant improvements in pain, function, and quality of life following GNRFA, with a substantially higher proportion of responders compared with the sham group.(Makkar et al. 2024) Das et al. published results of a non-industry-sponsored pragmatic RCT, where patients similarly experienced significant improvements in pain and function at 6 and 12 months post-GNRFA.(Das et al. 2025) The LCD relies heavily on Almeida et al., a review with substantial methodological and interpretive limitations.(Almeida et al. 2025) Specifically, the authors pooled trials with differing procedural targets and lesion strategies, obscuring clinically meaningful distinctions. The review also failed to stratify outcomes by key procedural factors such as the number of nerves treated or lesion size – both of which have been shown to affect results significantly. Finally, Almeida et al. downgraded nearly all included evidence to “very low certainty” without transparent application of the GRADE methodology.

In contrast, Kanjanapanang et al. systematically evaluated these procedural variables.(Kanjanapanang et al. 2025) Their pooled data demonstrated higher success rates when three or more nerves were treated, particularly the superomedial, superolateral, and inferomedial branches, and when larger lesions were created using an 18G cannula, bipolar lesioning technique, or internally-cooled thermal RFA, compared with monopolar 22G RFA needles or other small RFA lesion sizes. These procedural factors are critical determinants of efficacy and should be incorporated into any valid assessment of the clinical evidence. Omitting these variables, as was done in the Almeida review, produces misleading conclusions. Based on this careful evaluation of the evidence, procedural techniques continue to be refined to maximize effectiveness.

In the past five years alone, at least 10 systematic reviews and meta-analyses including more than 25 RCTs have evaluated GNRFA (Kanjanapanang et al. 2025; Almeida et al. 2025; Wu et al. 2022; Ajrawat et al. 2020; Barreto et al. 2025; Fogarty et al. 2022; A. F. Chen et al. 2021; Soetjahjo et al. 2024; Zhang et al. 2021; Antunes Júnior et al. 2025) The overwhelming majority of these studies demonstrate clinically significant short- to medium-term improvements in pain and function compared to sham procedures or other treatments currently covered by CMS. Notably, every review except for Almeida et al. concluded that GNRFA is an effective treatment for knee osteoarthritis. Selectively relying on a single, methodologically flawed outlier review to justify non-coverage disregards the broader and more contemporary body of evidence and risks creating policy misaligned with the clear scientific consensus.

Evidence-Based Multidisciplinary Guideline Support

Several guidelines have been published in recent years, transparently assessing the evidence and formulating evidence-based recommendations for GNRFA.(C. W. Hunter et al. 2022; Das et al. 2022) The ASPN guideline was published in 2022, included in the LCD, and concluded that GNRFA of the superomedial, superolateral, and inferomedial branches is safe and effective for treating KOA as well as pain that is refractory to total knee arthroplasty (TKA) (Level of Evidence: I, Grade of Recommendation: A, Strong Consensus).(C. W. Hunter et al. 2022) The second guideline was published by the Indian Society for the Study of Pain in 2022, but was not included in the LCD. The guideline concluded that GNRFA for KOA provides significant pain relief and mid- to long-term functional improvement (Level of Evidence: I, Grade of Recommendation: A, Strong Consensus). Both conventional and cooled RFA may yield meaningful pain relief and improved performance in patients with post-TKA pain and dysfunction (Level of Evidence: I, Grade of Recommendation: A, Strong Consensus).(Das et al. 2022)

A forthcoming multisociety guideline from pain medicine, musculoskeletal, and radiology organizations, expected to be published in the next 3 months, recommends treating three or more genicular nerves using an 18G cannula, bipolar lesioning technique, or internally-cooled thermal RFA, which all produce larger ablation zones, and adhering to appropriate diagnostic and imaging criteria for patient selection. This multisociety consensus reflects the maturity of the field and establishes a reproducible, high-value standard of care.

Patient/clinical experience:

If access to GNRFA were removed, downstream consequences would likely include increased opioid prescriptions with their associated morbidity and healthcare costs, unnecessary total knee replacements in patients who could otherwise delay or avoid surgery with adequate pain relief, accelerated functional decline, reduced mobility, increased caregiver burden among elderly or frail patients, higher rates of emergency visits for uncontrolled pain, and missed opportunities to treat chronic post-TKA pain for which few alternatives exist. These outcomes would likely increase healthcare utilization and costs rather than reduce them, directly opposing the goals of value-based care initiatives. From a cost standpoint, based on the 2024 Medicare Part B National Summary Data file, genicular nerve blocks and ablations accounted for \$17,686,110. (“Part B National Summary Data File (Previously Known as BESS),” n.d.) Knee arthroplasty accounted for \$708,809,643, and knee revision accounted for \$33,929,327. Based on these data, it would require only a ~2.5% increase in TKA spending to erase all “savings” from cutting GNRFA. Given the clinical reality that many GNRFA-eligible patients will progress to surgery or require revision in the absence of this minimally invasive option, even small upticks in TKA volume (alone or alongside revisions) would be expected to increase, not decrease, Medicare spending. A 92-year-old patient with inoperable knee pain is otherwise healthy and wheelchair bound because of knee pain. Genicular nerve blocks and a radiofrequency ablation give her the opportunity to be able to function, and she has strongly urged Medicare to not cut off care for patients like her.

Pudendal Nerve Block

Overall Conclusion:

Pudendal neuralgia (PN) is a neuropathic-type pain that is perceived in the distribution of the pudendal nerve (genital region) and is often associated with signs and symptoms of rectal, urinary tract and/or sexual dysfunction. The current diagnostic criteria for PN rely on four clinical features and one diagnostic modality – positive response to pudendal nerve block. (Labat et al. 2008) Without access to pudendal nerve block, patients cannot receive a diagnosis of pudendal neuralgia, and access to care would be stymied. The assertion that “it is not reasonable and necessary for therapeutic PNBs” for the treatment of pelvic pain via the use of pudendal nerve blocks also fails to recognize that pudendal nerve blocks are not used in isolation for the treatment of pudendal neuralgia. Given the overlapping innervation of the pelvis, pudendal nerve blocks can serve to identify the causative pathology in a patient, identify appropriate candidates for surgery or advanced procedures (pudendal nerve pulsed radiofrequency) and also provide sustained treatment for some types of pudendal nerve entrapment (therapeutic nerve blocks).

Relevant literature:

We question the conclusion that the proposed LCD draws based on the European Association of Urology guideline on chronic pelvic pain. (“[No Title],” n.d.-b) This guideline clearly states that while the evidence base for nerve blocks for undifferentiated chronic pelvic pain may be weak

because they can be difficult to interpret, it clearly goes on to state that “differential block of the pudendal nerve helps to provide information in relation to the site where the nerve may be trapped” and categorizes these recommendations as “strong”. Diagnostic pudendal nerve blocks play a critical role in the diagnosis of chronic pelvic pain. Because pudendal neuralgia involves a range of symptoms and is not a distinct disease with a singular cause, responses to nerve blocks vary; studies showing mixed results reflect this variability, not a lack of effectiveness for all patients. In short, losing access to pudendal nerve blocks would deny patients the ability to receive a diagnosis.(Cain et al. 2022) The authors of the Levin study cited in the proposed LCD wish to clarify that (1) of the 96 patients with follow up data, 81 had pain relief confirming a diagnosis of PN, and (2) in their study “the therapeutic component of the block helped prolong the effect in 50% of patients, thereby preventing patients from requiring further interventions, which [are] costly and invasive.”(Levin et al. 2024)

If this did not occur, the block diagnosed pudendal neuralgia and allowed patients to proceed to longer term interventions such as pulsed radiofrequency ablation. They also point to an excellent safety profile (personal communication with senior author Meera Kirpekar, MD). Because pudendal nerve symptoms can arise from multiple mechanisms (mechanical, inflammatory, intrinsic dysfunction, demyelination) and locations (extra-pelvic or interligamentous vs endopelvic entrapment) it is not surprising that therapeutic blocks are not uniformly effective.(Cain et al. 2022; Basol et al. 2022) A retrospective longitudinal cohort study of 67 women (median age 37) undergoing pudendal nerve blocks by Basol et al. differentiated between extra-pelvic vs endopelvic pudendal nerve entrapment. Therapeutic success was defined as achieving at least 50% pain relief. The success rate at one month, 3 months, and 12 months was 75%, 78%, and 68.3% respectively for the extra-pelvic group and 62.7%, 69.6% and 58.9% respectively overall. Benefit did decline at 24 months, although participants still reported a significant reduction in the mean and median VAS scores. This cohort study has a more robust design than Levin et al. and acknowledges the heterogeneity of diagnoses underlying pudendal neuralgia.(Levin et al. 2024; Basol et al. 2022) A recent meta-analysis brought the weaknesses of prior studies (heterogeneous patient populations, poor quality studies, short-term follow up) to light, raising a strong caution against depriving patients of this treatment without better quality studies.(Andiman et al. 2025) Furthermore, even if pudendal nerve blocks provide a short duration of significant relief, they enable patients to work effectively with pelvic floor physical therapy (which may be prohibited by baseline allodynia) and provide some patients with the option of ablation or decompressive surgery.(Conic, Kaur, and Kohan 2025) Regarding ablation, a prospective RCT evaluated 77 patients having pudendal nerve block vs pulsed radiofrequency ablation, with the latter demonstrating a significant reduction in VAS scores as well as PHQ scores at the two-week, one month and three-month mark.(Fang et al. 2018) Without access to pudendal nerve blocks, offering patients decompressive surgery - an already complex and significant procedure - would be nearly impossible.

The use of advanced imaging (MR neurography, MRN) may increase both the diagnostic and therapeutic value of pudendal nerve blocks, at least in men. In a 2019 study, MRN was positive in 64.7% of nerves, and CT-guided pudendal blocks had a therapeutic impact in 66.9% of patients reporting a significant decrease in pain, an effect that was seen in men but not women. Almost one-third of the patients reported a decrease in pain greater than 50% following pudendal block. This study reinforces the benefit of pudendal nerve blocks as a diagnostic test and also

supports their use as therapeutic blocks.(Ly et al. 2019) Regarding the use of steroid in pudendal nerve blocks, we tend to agree that there is not robust evidence demonstrating that steroid provides added benefit over local anesthetic alone, though patients often report additional benefit including prolongation of block.

Patient/clinical experience:

A 67-year-old with unrelenting vaginal pain and pressure after a hysterectomy receives 9-weeks 100% relief after pudendal nerve blocks and for the first time in 6 years can sit, wear pants, and forget she even had pain. The pain is overall more manageable and repeat injections every 3-4 months provide consistent function benefits.

Patient TS is a 64-year-old woman with symptoms of pudendal neuralgia and persistent genital arousal disorder that began after hysterectomy. She suffered with these symptoms for nearly 13 years and reported inability to travel to work or have intercourse with her husband. She was treated with opioids for her pain and described being extremely isolated as few people around her had even heard of her condition. She had some benefit with tricyclic antidepressants but these were discontinued due to severe urinary retention. She had her first bilateral pudendal nerve block (transgluteal fluoroscopic approach) in 2022 and had 4-5 days of 100% pain relief followed by a brief flare and then a period of 10 months with no symptoms, described as “10 months of bliss.” During that time, she was able to have intercourse with her husband and exercise. She had a second pudendal nerve block in early 2024 which provided 75% pain relief, enabling her to engage in intercourse with her husband. She had a second pudendal nerve block in 2024 and two in 2025, which overall provided her consistent 75% pain relief.

Direct quotes from this patient:

“I have been a patient of Dr. [sic] now for over 5 years. I am a CHRONIC PAIN SUFFERER WITH PUDENDAL NEURALGIA. I was diagnosed with this condition by a primary physician 7 years ago. That being said I suffered with this hideous condition not knowing what it was for more than 13 years. There is NO CURE at this time for this condition, only [n]erve [b]locks and [n]erve medication which doesn't work like I would like it too. I was referred to the [a]bove 5 years ago and I received a Pudendal Bilateral Nerve Block that lasted almost 9 months. My quality of life improved dramatically. I could actually sit again and walk for exercise and have relations with my husband again. I could work again as well ... The Nerve block for me is my "Saving Grace"... People are committing SUICIDE because they have exhausted their resources and they have lost their Hope, leaving families devastated. Now I find out that there is a Threat that Federal funding my Stop Providing Pain suffers from having this Procedure is Preposterous when it is our only Treatment at this time makes no sense to me at all. Where is the Compassion and Empathy for the Patient?”

Patient JR is a 71-year-old woman and cervical cancer survivor. Her cancer was diagnosed in 2022 and treated with radiation and chemotherapy, then recurred and was treated with radiation which was complicated by radiation cystitis, colovesical fistula and severe vaginal pain described as the sensation of sitting on a rock, sitting intolerance, and external vaginal pain. When she first presented, she was on oxycodone 10mg TID in combination with alprazolam. She had also tried MS Contin. At our first visit she was somnolent appearing but requesting oxycodone, and her daughter expressed significant concern that medications were not only not

helping, but making her mom confused. In April 2025, she had a bilateral pudendal nerve block (transgluteal fluoroscopic approach) with immediate 100% pain relief. She was able to titrate off of her opioid medications and upon last visit in October 2025 was still off opioids and had returned to work.

Other Peripheral Nerve Block (Digital, Posterior Tibial, Ulnar, Hip Articular, etc.)

Overall Conclusion:

For most patients, a denial of coverage is tantamount to denial of treatment. In practical effect, this Local Coverage Determination will deny patients' access to a broad swath of long-covered diagnostic and therapeutic procedures. The LCD comes at a moment when pharmaceutical options like opioids are being curtailed or, in the case of gabapentinoids, questioned, and when chronic pain is growing in the U.S., with new cases outpacing those of diabetes, hypertension and depression.(Nahin et al. 2023)

Importantly, the LCD fails to account for the multimodal and multidisciplinary way pain is managed. For many patients, peripheral nerve blocks are the catalyst that enables them to begin physical therapy or other treatments, which, in turn, enhances function and improves quality of life.

References

- Abd-Elseyed, Alaa, Samuel Lee, and Markus Jackson. 2018. "Radiofrequency Ablation for Treating Resistant Intercostal Neuralgia." *Ochsner Journal* 18 (1): 91–93.
- Aggarwal, Anurag, Varun Suresh, Bhavna Gupta, and Sidharth Sonthalia. 2020. "Post-Herpetic Neuralgia: A Systematic Review of Current Interventional Pain Management Strategies." *Journal of Cutaneous and Aesthetic Surgery* 13 (4): 265–74.
- Ajrawat, Prabjit, Lenny Radomski, Anuj Bhatia, Phillip Peng, Nikhil Nath, and Rajiv Gandhi. 2020. "Radiofrequency Procedures for the Treatment of Symptomatic Knee Osteoarthritis: A Systematic Review." *Pain Medicine (Malden, Mass.)* 21 (2): 333–48.
- Almeida, Matheus, Bruno T. Saragiotto, David J. Hunter, Murillo Dorio, Vicky Duong, Rajib Dutta, and Leticia Devez. 2025. "Efficacy and Safety of Minimally Invasive Interventions Targeting the Genicular Nerves for Knee Osteoarthritis: A Meta-Analysis." *Osteoarthritis and Cartilage* 33 (5): 535–47.
- Andiman, Sarah E., Julia S. Maron, Vani Dandolu, Elizabeth Drugge, Ryan P. Cosgro, Meganne M. Vasey, Gregory C. Spaulding, et al. 2025. "Impact of Treatment of Pudendal Neuralgia on Pain: A Systematic Review and Meta-Analysis." *International Urogynecology Journal* 36 (1): 35–58.
- Annison, David Richard, Neil Smith, Emma Salt, Tim Noblet, Amar Rangan, and Catriona McDauid. 2025. "Physical Harms Associated with Suprascapular Nerve Block Interventions in the Non-Surgical Management of Acute and Chronic Shoulder Pain: A Systematic Review." *Shoulder & Elbow* 17 (3): 236–53.
- Antunes Júnior, César Romero, Rodrigo Campos de Oliveira Pinto, Eduardo Silva Reis Barreto, João Pedro Fernandes Gonçalves, Luiz Gustavo Albuquerque, Ian Garrido Kraychete, Liana Maria Torres de Araujo Azi, Liliane Elze Falcão Lins-Kusterer, and Durval Campos Kraychete. 2025. "Efficacy and Safety of Nerve Ablation Techniques Versus Sham Procedures in Knee Osteoarthritis: A Systematic Review and Meta-Analysis of Randomized Clinical Trials." *Pain Practice : The Official Journal of World Institute of Pain* 25 (7): e70073.
- Asplund, Pär, Patric Blomstedt, and A. Tommy Bergenheim. 2016. "Percutaneous Balloon Compression vs Percutaneous Retrogasserian Glycerol Rhizotomy for the Primary Treatment of Trigeminal Neuralgia." *Neurosurgery* 78 (3): 421–28; discussion 428.
- Balta, Selin, and Gül Köknel Talu. 2021. "Clinical Effectiveness of Peripheral Nerve Blocks with Lidocaine and Corticosteroid in Patients with Trigeminal Neuralgia." *Agri : Agri (Algoloji) Dernegi'nin Yayin Organidir = The Journal of the Turkish Society of Algology* 33 (4): 237–42.
- Barreto, Ronald Bispo, André de Jesus Barreto, Abel Luis Martins do Nascimento, Davi Martins Barreto Carvalho, and Bárbara Queiroz. 2025. "Efficacy and Safety of Genicular Nerve Ablation Techniques for Knee Osteoarthritis: A Systematic Review and Meta-Analysis of Sham-

Controlled Randomized Trials.” *Pain Medicine (Malden, Mass.)*, October.
<https://doi.org/10.1093/pm/pnaf140>.

Basol, Gulfem, Ahmet Kale, Hande Gurbuz, Elif Cansu Gundogdu, Kursad Nuri Baydilli, and Taner Usta. 2022. “Transvaginal Pudendal Nerve Blocks in Patients with Pudendal Neuralgia: 2-Year Follow-up Results.” *Archives of Gynecology and Obstetrics* 306 (4): 1107–16.

Batten, T. J., J. P. Evans, E. G. Burden, W. K. Mak, W. White, and C. D. Smith. 2023. “Suprascapular Nerve Blockage for Painful Shoulder Pathology - a Systematic Review and Meta-Analysis of Treatment Techniques.” *Annals of the Royal College of Surgeons of England* 105 (7): 589–98.

Bick, Sarah K. B., and Emad N. Eskandar. 2017. “Surgical Treatment of Trigeminal Neuralgia.” *Neurosurgery Clinics of North America* 28 (3): 429–38.

Blakey, Shannon M., Kristine L. Rae Olmsted, Shawn Hirsch, Kat Asman, Dennis Wallace, Murrey G. Olmsted, Russ Vandermaas-Peeler, Rhonda S. Karg, and Bradford B. Walters. 2024. “Differential Posttraumatic Stress Disorder Symptom Cluster Response to Stellate Ganglion Block: Secondary Analysis of a Randomized Controlled Trial.” *Translational Psychiatry* 14 (1): 223.

Byas-Smith, Michael G., and Amitabh Gulati. 2006. “Ultrasound-Guided Intercostal Nerve Cryoablation.” *Anesthesia and Analgesia* 103 (4): 1033–35.

Cain, Abigail, Kimberly Carter, Christina Salazar, and Amy Young. 2022. “When and How to Utilize Pudendal Nerve Blocks for Treatment of Pudendal Neuralgia.” *Clinical Obstetrics and Gynecology* 65 (4): 686–98.

Chan, Chin-Wern, and Philip W. H. Peng. 2011. “Suprascapular Nerve Block: A Narrative Review.” *Regional Anesthesia and Pain Medicine* 36 (4): 358–73.

Chang, Ke-Vin, Chen-Yu Hung, Wei-Ting Wu, Der-Sheng Han, Rong-Sen Yang, and Chih-Peng Lin. 2016. “Comparison of the Effectiveness of Suprascapular Nerve Block With Physical Therapy, Placebo, and Intra-Articular Injection in Management of Chronic Shoulder Pain: A Meta-Analysis of Randomized Controlled Trials.” *Archives of Physical Medicine and Rehabilitation* 97 (8): 1366–80.

Chen, Antonia F., Fred Khalouf, Keith Zora, Michael DePalma, Lynn Kohan, Maged Guirguis, Douglas Beall, et al. 2020a. “Cooled Radiofrequency Ablation Compared with a Single Injection of Hyaluronic Acid for Chronic Knee Pain: A Multicenter, Randomized Clinical Trial Demonstrating Greater Efficacy and Equivalent Safety for Cooled Radiofrequency Ablation.” *The Journal of Bone and Joint Surgery. American Volume* 102 (17): 1501–10.
———. 2020b. “Cooled Radiofrequency Ablation Provides Extended Clinical Utility in the Management of Knee Osteoarthritis: 12-Month Results from a Prospective, Multi-Center, Randomized, Cross-over Trial Comparing Cooled Radiofrequency Ablation to a Single Hyaluronic Acid Injection.” *BMC Musculoskeletal Disorders* 21 (1): 363.

Chen, Antonia F., Kyle Mullen, Francisco Casambre, Vidya Visvabharathy, and Gregory A. Brown. 2021. "Thermal Nerve Radiofrequency Ablation for the Nonsurgical Treatment of Knee Osteoarthritis: A Systematic Literature Review." *The Journal of the American Academy of Orthopaedic Surgeons* 29 (9): 387–96.

Chen, Jun, Lan Lan, Wei Wang, and Xinchang Xu. 2023. "Efficacy and Safety of Pulsed Radiofrequency Combined with Pregabalin for Herpetic Neuralgia: A Systematic Review and Meta-Analysis." *Medicine* 102 (23): e33932.

Chen, Lizhao, Minhui Xu, and Yongwen Zou. 2010. "Treatment of Trigeminal Neuralgia with Percutaneous Glycerol Injection into Meckel's Cavity: Experience in 4012 Patients." *Cell Biochemistry and Biophysics* 58 (2): 85–89.

Choi, Woo-Jong, Seung-Jun Hwang, Jun-Gol Song, Jeong-Gil Leem, Yong-Up Kang, Pyong-Hwan Park, and Jin-Woo Shin. 2011. "Radiofrequency Treatment Relieves Chronic Knee Osteoarthritis Pain: A Double-Blind Randomized Controlled Trial." *Pain* 152 (3): 481–87.

Chowdhury, Debashish, Debabrata Datta, and Ankit Mundra. 2021. "Role of Greater Occipital Nerve Block in Headache Disorders: A Narrative Review." *Neurology India* 69 (Supplement): S228–56.

Cohen, Steven P., Chachrit Khunsriraksakul, Yongjae Yoo, Evan Parker, Christelle D. K. Samen-Akinsiku, Nirav Patel, Seffrah J. Cohen, Xiaoning Yuan, Jianguo Cheng, and Jee Youn Moon. 2023. "Sympathetic Blocks as a Predictor for Response to Ketamine Infusion in Patients with Complex Regional Pain Syndrome: A Multicenter Study." *Pain Medicine (Malden, Mass.)* 24 (3): 316–24.

Conic, Rosalynn R. Z., Prabhleen Kaur, and Lynn R. Kohan. 2025. "Pudendal Neuralgia: A Review of the Current Literature." *Current Pain and Headache Reports* 29 (1): 38.

Das, Gautam, Sushpa Das, Vikas S. Sharma, Shirish Prasad Amatya, Smruti Rekha Hota, and Anamul Haque Milton. 2025. "Efficacy and Safety of Conventional and Cooled Radiofrequency Ablation in Patients with Advanced Knee Osteoarthritis: A Prospective, Randomized, Double-Blind Study." *Indian Journal of Pain* 39 (1): 18–23.

Das, Gautam, Pankaj Surange, Anurag Agarwal, Kailash Kothari, Samarjit Dey, Karthic Babu Natarajan, Palak Mehta, et al. 2022. "Radiofrequency Ablation in Chronic Pain Syndromes." *Indian Journal of Pain* 36 (Suppl 1): S2–23.

Davis, Tim, Eric Loudermilk, Michael DePalma, Corey Hunter, David A. Lindley, Nileshkumar Patel, Daniel Choi, et al. 2019. "Twelve-Month Analgesia and Rescue, by Cooled Radiofrequency Ablation Treatment of Osteoarthritic Knee Pain: Results from a Prospective, Multicenter, Randomized, Cross-over Trial." *Regional Anesthesia and Pain Medicine*, February. <https://doi.org/10.1136/rapm-2018-100051>.

Davis, Tim, Eric Loudermilk, Michael DePalma, Corey Hunter, David Lindley, Nilesh Patel, Daniel Choi, et al. 2018. "Prospective, Multicenter, Randomized, Crossover Clinical Trial Comparing the Safety and Effectiveness of Cooled Radiofrequency Ablation With Corticosteroid Injection in the Management of Knee Pain From Osteoarthritis." *Regional Anesthesia and Pain Medicine* 43 (1): 84–91.

DesRochers, John, Samantha Fry, Arwa Khadr, Neel Rana, and Gilbert Siu. 2024. "Cryoneurolysis for Management of Post-Mastectomy Pain: A Systematic Review." *Pain Management* 14 (12): 665–71.

Di Lorenzo, L., M. Pappagallo, R. Gimigliano, E. Palmieri, E. Saviano, A. Bello, A. Forte, E. DeBlasio, and C. Trombetti. 2006. "Pain Relief in Early Rehabilitation of Rotator Cuff Tendinitis: Any Role for Indirect Suprascapular Nerve Block?" *Europa Medicophysica* 42 (3): 195–204.

Djade, Codjo D., Teegwendé V. Porgo, Hervé Tchala Vignon Zomahoun, Gentiane Perrault-Sullivan, and Clermont E. Dionne. 2020. "Incidence of Shoulder Pain in 40 Years Old and over and Associated Factors: A Systematic Review." *European Journal of Pain (London, England)* 24 (1): 39–50.

El-Hakeim, Eman H., Abdelraheem Elawamy, Emad Zariief Kamel, Samar H. Goma, Rania M. Gamal, Abeer M. Ghandour, Ayman M. Osman, and Khalid M. Morsy. 2018. "Fluoroscopic Guided Radiofrequency of Genicular Nerves for Pain Alleviation in Chronic Knee Osteoarthritis: A Single-Blind Randomized Controlled Trial." *Pain Physician* 21 (2): 169–77.

Elkhashab, Yasmin, and Dajie Wang. 2021. "A Review of Techniques of Intercostal Nerve Blocks." *Current Pain and Headache Reports* 25 (10): 67.

Elsamadicy, Aladine A., Siyun Yang, Amanda R. Sergesketter, Bilal Ashraf, Lefko Charalambous, Hanna Kemeny, Tiffany Ejikeme, et al. 2018. "Prevalence and Cost Analysis of Complex Regional Pain Syndrome (CRPS): A Role for Neuromodulation." *Neuromodulation : Journal of the International Neuromodulation Society* 21 (5): 423–30.

Elsheikh, Nabil Ail, and Yasser M. Amr. 2016. "Calcitonin as an Additive to Local Anesthetic and Steroid Injection Using a Modified Coronoid Approach in Trigeminal Neuralgia." *Pain Physician* 19 (7): 457–64.

Ertlav, Esra, and Osman Nuri Aydın. 2024. "Comparison of the Efficacy of Repeated Greater Occipital Nerve Block and Pulsed Radiofrequency Therapy in Chronic Migraine Patients: A Randomized Controlled Study." *Journal of Oral & Facial Pain and Headache* 38 (3): 100–107.

Fang, Hongwei, Jinyuan Zhang, Yu Yang, Le Ye, and Xiangrui Wang. 2018. "Clinical Effect and Safety of Pulsed Radiofrequency Treatment for Pudendal Neuralgia: A Prospective, Randomized Controlled Clinical Trial." *Journal of Pain Research* 11 (October):2367–74.

Ferraro, Michael C., Aidan G. Cashin, Benedict M. Wand, Keith M. Smart, Carolyn Berryman, Louise Marston, G. Lorimer Moseley, James H. McAuley, and Neil E. O'Connell. 2023. "Interventions for Treating Pain and Disability in Adults with Complex Regional Pain Syndrome- an Overview of Systematic Reviews." *The Cochrane Database of Systematic Reviews* 6 (6): CD009416.

Fiala, Kenneth J., Joshua M. Martens, Mitchell K. Keith, Adam Ghouse, and Alaa Abd-Elseyed. 2023. "Cooled Radiofrequency Ablation for Intercostal Neuralgia." *Ochsner Journal* 23 (2): 159–63.

Fogarty, Alexandra E., Taylor Burnham, Keith Kuo, Quinn Tate, Beau P. Sperry, Cole Cheney, David R. Walega, et al. 2022. "The Effectiveness of Fluoroscopically Guided Genicular Nerve Radiofrequency Ablation for the Treatment of Chronic Knee Pain Due to Osteoarthritis: A Systematic Review." *American Journal of Physical Medicine & Rehabilitation* 101 (5): 482–92.

Friedman, Benjamin W., Jason West, David R. Vinson, Mia T. Minen, Andrew Restivo, and E. John Gallagher. 2015. "Current Management of Migraine in US Emergency Departments: An Analysis of the National Hospital Ambulatory Medical Care Survey." *Cephalalgia : An International Journal of Headache* 35 (4): 301–9.

Gado, K., and P. Emery. 1993. "Modified Suprascapular Nerve Block with Bupivacaine Alone Effectively Controls Chronic Shoulder Pain in Patients with Rheumatoid Arthritis." *Annals of the Rheumatic Diseases* 52 (3): 215–18.

Guven Kose, Selin, Zeynep Kirac Unal, Halil Cihan Kose, Feyza Celikel, and Omer Taylan Akkaya. 2023. "Ultrasound-Guided Genicular Nerve Radiofrequency Treatment: Prospective Randomized Comparative Trial of a 3-Nerve Protocol versus a 5-Nerve Protocol." *Pain Medicine (Malden, Mass.)* 24 (7): 758–67.

Hacıbeyoğlu, Gülçin, Şule Arıcan, Sinan Oğuzhan Ulukaya, Resul Yılmaz, Ruhiye Reisli, and Sema Tuncer Uzun. 2020. "Evaluation of the Efficacy of Erector Spinae Plane Block and Intercostal Nerve Block in the Postherpetic Neuralgia." *Agri : Agri (Algoloji) Dernegi'nin Yayın Organidir = The Journal of the Turkish Society of Algology* 32 (4): 208–18.

Han, K. R., C. Kim, Y. J. Chae, and D. W. Kim. 2008. "Efficacy and Safety of High Concentration Lidocaine for Trigeminal Nerve Block in Patients with Trigeminal Neuralgia." *International Journal of Clinical Practice* 62 (2): 248–54.

Harley, Jonathan D., Confidence Njoku Austin, Alicia K. Harrison, Bryan M. Saltzman, and Allison J. Rao. 2025. "Intra-Articular Corticosteroid Injection vs. Suprascapular Nerve Block for Adhesive Capsulitis: A Systematic Review and Meta-Analysis of Level I Randomized Controlled Trials." *Journal of Shoulder and Elbow Surgery*, July. <https://doi.org/10.1016/j.jse.2025.05.037>.

Hascalovici, Jacob R., and Matthew S. Robbins. 2017. "Peripheral Nerve Blocks for the Treatment of Headache in Older Adults: A Retrospective Study." *Headache* 57 (1): 80–86.

Hunter, Corey, Tim Davis, Eric Loudermilk, Leonardo Kapural, and Michael DePalma. 2020. "Cooled Radiofrequency Ablation Treatment of the Genicular Nerves in the Treatment of Osteoarthritic Knee Pain: 18- and 24-Month Results." *Pain Practice : The Official Journal of World Institute of Pain* 20 (3): 238–46.

Hunter, Corey W., Timothy R. Deer, Mark R. Jones, George C. Chang Chien, Ryan S. D'Souza, Timothy Davis, Erica R. Eldon, et al. 2022. "Consensus Guidelines on Interventional Therapies for Knee Pain (STEP Guidelines) from the American Society of Pain and Neuroscience." *Journal of Pain Research* 15 (September):2683–2745.

Ilfeld, Brian M., John J. Finneran, Matthew W. Swisher, Engy T. Said, Rodney A. Gabriel, Jacklynn F. Sztain, Bahareh Khatibi, et al. 2022. "Preoperative Ultrasound-Guided Percutaneous Cryoneurolysis for the Treatment of Pain after Mastectomy: A Randomized, Participant- and Observer-Masked, Sham-Controlled Study." *Anesthesiology* 137 (5): 529–42.

Jackson, James, Ravi Iyer, Jennifer Mellor, and Wenhui Wei. 2020. "The Burden of Pain Associated with Osteoarthritis in the Hip or Knee from the Patient's Perspective: A Multinational Cross-Sectional Study." *Advances in Therapy* 37 (9): 3985–99.

Jacques, Nicolas, Simon Karoutsos, Loïc Marais, and Nathalie Nathan-Denizot. 2022. "Quality of Life after Trigeminal Nerve Block in Refractory Trigeminal Neuralgia: A Retrospective Cohort Study and Literature Review." *The Journal of International Medical Research* 50 (10): 3000605221132027.

Kanjanapanang, Napatpaphan, Roy Madrid, Peter Lin, Mark Shilling, Amanda Cooper, Hasan Sen, Sherwin Thiagarajan, et al. 2025. "Effectiveness of Genicular Nerve Radiofrequency Ablation in Osteoarthritis and Post-Surgical Knee Pain: Systematic Review." *Pain Medicine (Malden, Mass.)*, August. <https://doi.org/10.1093/pm/pnaf115>.

Kanpolat, Y., A. Savas, A. Bekar, and C. Berk. 2001. "Percutaneous Controlled Radiofrequency Trigeminal Rhizotomy for the Treatment of Idiopathic Trigeminal Neuralgia: 25-Year Experience with 1,600 Patients." *Neurosurgery* 48 (3): 524–32; discussion 532–34.

Ke, Ma, Fan Yinghui, Jin Yi, Huang Xeuhua, Liu Xiaoming, Cheng Zhijun, Huang Chao, and Wang Yingwei. 2013. "Efficacy of Pulsed Radiofrequency in the Treatment of Thoracic Postherpetic Neuralgia from the Angulus Costae: A Randomized, Double-Blinded, Controlled Trial." *Pain Physician* 16 (1): 15–25.

Koonalintip, Prut, Suppakorn Yamutai, Suwanna Setthawatcharawanich, Therdpong Thongseiratch, Ply Chichareon, and Benjamin R. Wakerley. 2025. "Network Meta-Analysis Comparing Efficacy of Different Strategies on Medication-Overuse Headache." *The Journal of Headache and Pain* 26 (1): 43.

Labat, Jean-Jacques, Thibault Riant, Roger Robert, Gérard Amarenco, Jean-Pascal Lefaucheur, and Jérôme Rigaud. 2008. "Diagnostic Criteria for Pudendal Neuralgia by Pudendal Nerve Entrapment (Nantes Criteria)." *Neurourology and Urodynamics* 27 (4): 306–10.

Levin, Danielle, Daniel Van Florcke, Monika Schmitt, Lucinda Kurzava Kendall, Alop Patel, Lisa V. Doan, and Meera Kirpekar. 2024. "Fluoroscopy-Guided Transgluteal Pudendal Nerve Block for Pudendal Neuralgia: A Retrospective Case Series." *Journal of Clinical Medicine* 13 (9). <https://doi.org/10.3390/jcm13092636>.

Lipov, Eugene G., Ryan Jacobs, Shauna Springer, Kenneth D. Candido, and Nebojsa Nick Knezevic. 2022. "Utility of Cervical Sympathetic Block in Treating Post-Traumatic Stress Disorder in Multiple Cohorts: A Retrospective Analysis." *Pain Physician* 25 (1): 77–85.

Ly, Jimmy, Kelly Scott, Yin Xi, Oganesh Ashikyan, and Avneesh Chhabra. 2019. "Role of 3 Tesla MR Neurography and CT-Guided Injections for Pudendal Neuralgia: Analysis of Pain Response." *Pain Physician* 22 (4): E333–44.

Lyman, Jeffrey, Fred Khalouf, Keith Zora, Michael DePalma, Eric Loudermilk, Maged Guiguis, Douglas Beall, Lynn Kohan, and Antonia F. Chen. 2022. "Cooled Radiofrequency Ablation of Genicular Nerves Provides 24-Month Durability in the Management of Osteoarthritic Knee Pain: Outcomes from a Prospective, Multicenter, Randomized Trial." *Pain Practice : The Official Journal of World Institute of Pain* 22 (6): 571–81.

Makharita, Mohamed Y., Yasser Mohamed Amr, and Youssef El-Bayoumy. 2012. "Effect of Early Stellate Ganglion Blockade for Facial Pain from Acute Herpes Zoster and Incidence of Postherpetic Neuralgia." *Pain Physician* 15 (6): 467–74.

Makharita, Mohamed Y., Hanaa M. El Bendary, Zainab M. Sonbul, Salma E. S. Ahmed, and Mahmoud A. Latif. 2018. "Ultrasound-Guided Pulsed Radiofrequency in the Management of Thoracic Postherpetic Neuralgia: A Randomized, Double-Blinded, Controlled Trial." *The Clinical Journal of Pain* 34 (11): 1017–24.

Makkar, Jeetinder Kaur, Dr, Gayathri Warriar Dr, Babita Ghai Dr, Monica Chhabra, Pradip Kumar Sarkar Dr, Vijay G. Goni, and Bismar Jeet Kaur Khurana. 2024. "Effect of Radiofrequency Ablation of Genicular Nerves on the Isokinetic Muscle Strength of Knee Joint in Patients with Osteoarthritis Knee: A Randomized Double-Blind Sham Controlled Clinical Trial." *Pain Medicine (Malden, Mass.)*, August. <https://doi.org/10.1093/pm/pnae077>.

McCormick, Zachary L., Rajiv Reddy, Marc Korn, David Dayanim, Raafay H. Syed, Meghan Bhav, Mikhail Zhukalin, et al. 2018. "A Prospective Randomized Trial of Prognostic Genicular Nerve Blocks to Determine the Predictive Value for the Outcome of Cooled Radiofrequency Ablation for Chronic Knee Pain Due to Osteoarthritis." *Pain Medicine (Malden, Mass.)* 19 (8): 1628–38.

Meier, Shelby E., Michael B. Orr, Matthew S. Shotwell, Rebecca N. Jerome, Jana K. Shirey-Rice, Jill M. Pulley, David A. Edwards, Amanda D. Toye, Puneet Mishra, and Tigran Kesayan. 2025. "Enhanced Pain Relief with Guanfacine as an Adjuvant for Trigeminal Nerve Blocks: Insights from a PheWAS-Guided Randomized Controlled Study." *Pain Medicine (Malden, Mass.)* 26 (10): 643–54.

Moore, R. Andrew, and Henry J. McQuay. 2005. "Prevalence of Opioid Adverse Events in Chronic Non-Malignant Pain: Systematic Review of Randomised Trials of Oral Opioids." *Arthritis Research & Therapy* 7 (5): R1046–51.

Mustafa, Muhamad Saqlain, Shafin Bin Amin, Aashish Kumar, Muhammad Ashir Shafique, Syeda Mahrukh Fatima Zaidi, Syed Ali Arsal, Burhanudin Sohail Rangwala, et al. 2024. "Assessing the Effectiveness of Greater Occipital Nerve Block in Chronic Migraine: A Systematic Review and Meta-Analysis." *BMC Neurology* 24 (1): 330.

Nader, Antoun, Mark C. Kendall, Gildasio S. De Oliveria, Jeffry Q. Chen, Brooke Vanderby, Joshua M. Rosenow, and Bernard R. Bendok. 2013. "Ultrasound-Guided Trigeminal Nerve Block via the Pterygopalatine Fossa: An Effective Treatment for Trigeminal Neuralgia and Atypical Facial Pain." *Pain Physician* 16 (5): E537–45.

Nahin, Richard L., Termeh Feinberg, Flavia P. Kapos, and Gregory W. Terman. 2023. "Estimated Rates of Incident and Persistent Chronic Pain Among US Adults, 2019-2020." *JAMA Network Open* 6 (5): e2313563.

Nascimento, Rafaela Farias Vidigal, Leonardo Zumerkorn Pipek, and Paulo Henrique Pires de Aguiar. 2023. "Is Percutaneous Balloon Compression Better than Microvascular Decompression to Treat Trigeminal Neuralgia? A Systematic Review and Meta-Analysis." *Journal of Clinical Neuroscience : Official Journal of the Neurosurgical Society of Australasia* 109 (March):11–20.

Noorani, Imran, Amanda Lodge, Girish Vajramani, and Owen Sparrow. 2016. "Comparing Percutaneous Treatments of Trigeminal Neuralgia: 19 Years of Experience in a Single Centre." *Stereotactic and Functional Neurosurgery* 94 (2): 75–85.

"[No Title]." n.d.-a. Accessed November 6, 2025. <https://painschoolinternational.com/wp-content/uploads/2022/08/Non-SpinalPain.pdf>.

———. n.d.-b. Accessed November 6, 2025.

<https://d56bochlqxqz.cloudfront.net/documents/full-guideline/EAU-Guidelines-on-Chronic-Pelvic-Pain-2025.pdf>.

O'Connell, Neil E., Benedict M. Wand, William Gibson, Daniel B. Carr, Frank Birklein, and Tasha R. Stanton. 2016. "Local Anaesthetic Sympathetic Blockade for Complex Regional Pain Syndrome." *The Cochrane Database of Systematic Reviews* 7 (7): CD004598.

Otuka, Geovana Lissa Rodrigues, Luciano Magalhães Vitorino, Letícia Jonas de Freitas, Marcela Camargo Tozzo, and Anamaria Siriani de Oliveira. 2025. "Exploring the Associations between Religious-Spiritual and Psychosocial Factors, and Disability, Self-Efficacy, and Pain Intensity in Chronic Shoulder Pain." *Musculoskeletal Science & Practice* 80 (October):103435.

"Part B National Summary Data File (Previously Known as BESS)." n.d. Accessed November 6, 2025. <https://www.cms.gov/data-research/statistics-trends-and-reports/part-b-national-summary-data-file>.

Perloff, Michael D., and Justin S. Chung. 2018. "Urgent Care Peripheral Nerve Blocks for Refractory Trigeminal Neuralgia." *The American Journal of Emergency Medicine* 36 (11): 2058–60.

Puleda, Francesca, Simona Sacco, Hans-Christoph Diener, Messoud Ashina, Haidar M. Al-Khazali, Sait Ashina, Rami Burstein, et al. 2024. "International Headache Society Global Practice Recommendations for Preventive Pharmacological Treatment of Migraine." *Cephalalgia : An International Journal of Headache* 44 (9): 3331024241269735.

Radwan, I. A., S. Saito, and F. Goto. 2001. "High-Concentration Tetracaine for the Management of Trigeminal Neuralgia: Quantitative Assessment of Sensory Function after Peripheral Nerve Block." *The Clinical Journal of Pain* 17 (4): 323–26.

Rae Olmsted, Kristine L., Michael Bartoszek, Sean Mulvaney, Brian McLean, Ali Turabi, Ryan Young, Eugene Kim, et al. 2020. "Effect of Stellate Ganglion Block Treatment on Posttraumatic Stress Disorder Symptoms: A Randomized Clinical Trial." *JAMA Psychiatry* 77 (2): 130–38.

Santana-Pineda, María M., Luc E. Vanlinthout, Samuel Santana-Ramírez, Thibaut Vanneste, Jan Van Zundert, and José Pedro Novalbos-Ruiz. 2021. "A Randomized Controlled Trial to Compare Analgesia and Functional Improvement After Continuous Neuroablative and Pulsed Neuromodulative Radiofrequency Treatment of the Genicular Nerves in Patients with Knee Osteoarthritis up to One Year After the Intervention." *Pain Medicine (Malden, Mass.)* 22 (3): 637–52.

Sarı, Sinem, Osman N. Aydın, Yasemin Turan, Pınar Özlülerden, Ufuk Efe, and İmran Kurt Ömürlü. 2018. "Which One Is More Effective for the Clinical Treatment of Chronic Pain in Knee Osteoarthritis: Radiofrequency Neurotomy of the Genicular Nerves or Intra-Articular Injection?" *International Journal of Rheumatic Diseases* 21 (10): 1772–78.

Schoenherr, Jay W., David N. Flynn, and Alexander Doyal. 2023. "Suprascapular Nerve Block." In *StatPearls*. Treasure Island (FL): StatPearls Publishing.

Shanahan, E. M., M. Ahern, M. Smith, M. Wetherall, B. Bresnihan, and O. FitzGerald. 2003. "Suprascapular Nerve Block (using Bupivacaine and Methylprednisolone Acetate) in Chronic Shoulder Pain." *Annals of the Rheumatic Diseases* 62 (5): 400–406.

Shanahan, E. Michael, Tiffany K. Gill, Elizabeth Briggs, Catherine L. Hill, Gregory Bain, and Timothy Morris. 2022. "Suprascapular Nerve Block for the Treatment of Adhesive Capsulitis: A Randomised Double-Blind Placebo-Controlled Trial." *RMD Open* 8 (2). <https://doi.org/10.1136/rmdopen-2022-002648>.

Shanthanna, Harsha, Dina Aboutouk, Eugenia Poon, Ji Cheng, Christian Finley, James Paul, and Lehana Thabane. 2016. "A Retrospective Study of Open Thoracotomies versus Thoracoscopic Surgeries for Persistent Postthoracotomy Pain." *Journal of Clinical Anesthesia* 35 (December):215–20.

Soetjahjo, Bintang, Denny Adriansyah, Mochammadsyah Beizar Yudistira, Alif Noeriyanto Rahman, Herry Herman, and Sudhir Diwan. 2024. "The Analgesic Effectiveness of Genicular Nerve-Targeted Cooled and Pulsed Radiofrequency Ablation for Osteoarthritis Knee Pain: A Systematic Review and Meta-Analysis." *Pain Physician* 27 (7): 357–73.

Spaans, Louisa N., Marcel G. W. Dijkgraaf, Denis Susa, Erik R. de Loos, Jo M. J. Mourisse, R. Arthur Bouwman, Ad F. T. M. Verhagen, et al. 2025. "Intercostal or Paravertebral Block vs Thoracic Epidural in Lung Surgery: A Randomized Noninferiority Trial." *JAMA Surgery* 160 (8): 855–64.

Taha, J. M., and J. M. Tew Jr. 2000. "Honored Guest Presentation: Therapeutic Decisions in Facial Pain." *Clinical Neurosurgery* 46:410–31.

Tascón Padrón, Laura, Norah L. A. Emrich, Carolin Schröder, Florian Recker, Brigitte Strizek, and Jorge Jiménez Cruz. 2025. "Ultrasound-Guided Intercostal Block for the Management of Intercostal Neuralgia in Pregnant Women: Case Series and Review of the Literature." *International Journal of Gynaecology and Obstetrics: The Official Organ of the International Federation of Gynaecology and Obstetrics* 170 (2): 532–37.

Tate, Quinn, James B. Meiling, Taylor R. Burnham, Aaron Conger, and Zachary L. McCormick. 2022. "A Pilot Study of an Expanded Genicular Nerve Radiofrequency Ablation Protocol for the Treatment of Chronic Knee Pain." *Pain Medicine (Malden, Mass.)* 23 (3): 599–602.

Tian, Yansen, Yang Hu, Tongyao Hu, Tangfen Liu, Guangzhou An, Jing Li, Haiqiang Wang, and Junling Xing. 2024. "Stellate Ganglion Block Therapy for Complex Regional Pain Syndrome: A Systematic Review and Meta-Analysis." *Pain Physician* 27 (4): 175–84.

Wang, Changsheng, Fei Yuan, Lu Cai, Haiqin Lu, Gongjin Chen, and Jinping Zhou. 2022. "Ultrasound-Guided Stellate Ganglion Block Combined with Extracorporeal Shock Wave Therapy on Postherpetic Neuralgia." *Journal of Healthcare Engineering* 2022 (January):9808994.

Wong, Philip Kin-Wai, Nima Kokabi, Yi Guo, David Reiter, Nickolas Bernard Reimer, Shervin Oskouei, and Felix M. Gonzalez. 2021. "Safety and Efficacy Comparison of Three- vs Four-Needle Technique in the Management of Moderate to Severe Osteoarthritis of the Knee Using Cooled Radiofrequency Ablation." *Skeletal Radiology* 50 (4): 739–50.

Wu, Limin, Yifan Li, Haibo Si, Yi Zeng, Mingyang Li, Yuan Liu, and Bin Shen. 2022. "Radiofrequency Ablation in Cooled Monopolar or Conventional Bipolar Modality Yields More Beneficial Short-Term Clinical Outcomes Versus Other Treatments for Knee Osteoarthritis: A Systematic Review and Network Meta-Analysis of Randomized Controlled Trials." *Arthroscopy : The Journal of Arthroscopic & Related Surgery : Official Publication of the Arthroscopy Association of North America and the International Arthroscopy Association* 38 (7): 2287–2302.

Yoshida, Mitsukuni, Peter K. Park, and Loc V. Thang. 2025. "Evaluation of Internally Cooled Radiofrequency Ablation Targeting Multiple Shoulder Nerves for Chronic Shoulder Pain Relief

and Function Restoration: A Prospective Study.” *Pain Medicine (Malden, Mass.)* 26 (7): 397–406.

Zhang, Hua, Bo Wang, Jie He, and Zhongju Du. 2021. “Efficacy and Safety of Radiofrequency Ablation for Treatment of Knee Osteoarthritis: A Meta-Analysis of Randomized Controlled Trials.” *The Journal of International Medical Research* 49 (4): 3000605211006647.

Zheng, Chan, Yuanyuan Xie, Huijuan Li, Bingchang Zhang, Sifang Chen, Wanhong Han, Jiacheng Liu, Yanyan Geng, Yaya Zhang, and Zhanxiang Wang. 2025. “Effectiveness and Safety of Stellate Ganglion Block with Trioxigen Autologous Blood Retransfusion Therapy for Facial Postherpetic Neuralgia in Elderly Patients.” *Scientific Reports* 15 (1): 8025.