CLINICAL REVIEW

Cervicogenic Headaches: Practical Considerations for Prevention, Diagnosis, and Management in Primary Care

Pre-test Quiz

TRUE OR FALSE

1) Cervicogenic headaches represent the most common form of daily headache

2) MRI is a critical diagnostic tool and should be ordered early

3) The treatment of cervicogenic headache is primarily surgical

ABSTRACT

Treatment-refractory headache results in chronic, function-limiting pain despite multiple trials of preventive and abortive therapies. Among adults evaluated for headache, cervicogenic headache represents an important but relatively uncommon cause of headache, representing 4% of cases, with a female predominance. Identifying cervicogenic headache is clinically significant as it localizes the pain source to the cervical spine, guiding targeted, spine-focused management and avoiding ineffective treatments and unnecessary investigations.

As interest and evidence expand, there is a greater need to translate current knowledge into practical guidelines. We highlight the most current evidence regarding prevention, diagnosis and management of cervicogenic headache.

KEYWORDS: Cervicogenic headache, neck pain, unilateral headache, cervical spine

Introduction

Cervicogenic headache manifests when referred pain to the head results from a source in the upper cervical spine (typically C1-C3 levels). This occurs through a phenomenon termed trigeminocervical convergence, whereby cervical nerve fibers and trigeminal nerve fibers interact in the upper spinal cord, causing spinal pathology to be perceived as headache.[4,5] Specifically, convergence of nociceptive afferents from the upper cervical spinal nerves with the trigeminal nerve (Figure 1) enables pain originating in neck structures, such as synovial joints, intervertebral discs, and muscles, to be referred to regions of the head innervated by the trigeminal nerve, resulting in the typical unilateral headache.[4–6]

Kathryn McIntosh, MD, PhD, PGY-1 Neurosurgery *From Departments of Surgery Dalhousie University and Nova Scotia Health*

Sean Taylor, MD, FRCPC, Assistant Professor, Neurology *From Departments of Medicine, Dalhousie University and Nova Scotia Health*

Sean D Christie, MD, FRCSC, Professor and Head, Neurosurgery *From Departments of Surgery, Dalhousie University and Nova Scotia Health*

In 1983 the term "cervicogenic headache" was formally introduced and its criteria first described.[7] Early experimental studies demonstrated that noxious stimulation of upper cervical structures could elicit referred pain in the head supporting the convergence theory. Subsequent anatomical and physiological research provided further evidence supporting the role of the trigeminocervical complex in mediating this referral pattern. The trigeminocervical complex is located where the caudal aspect of the spinal trigeminal tract apposes the upper cervical component of the spinothalamic tract creating the potential for interactions and referral patterns of pain.

Although cervicogenic headache accounts for only a minority of patients evaluated broadly for headache, its recognition is clinically important because it represents a pain generator which can be targeted using distinct, spine-focused management strategies. Identifying a cervical source allows primary care providers to move beyond nonspecific headache therapy toward focused education, postural modification and cervical intervention that addresses the underlying dysfunction. For many patients, this shift in approach not only improves diagnostic clarity but allows for more effective relief and a clearer understanding of how spine health influences their symptoms.

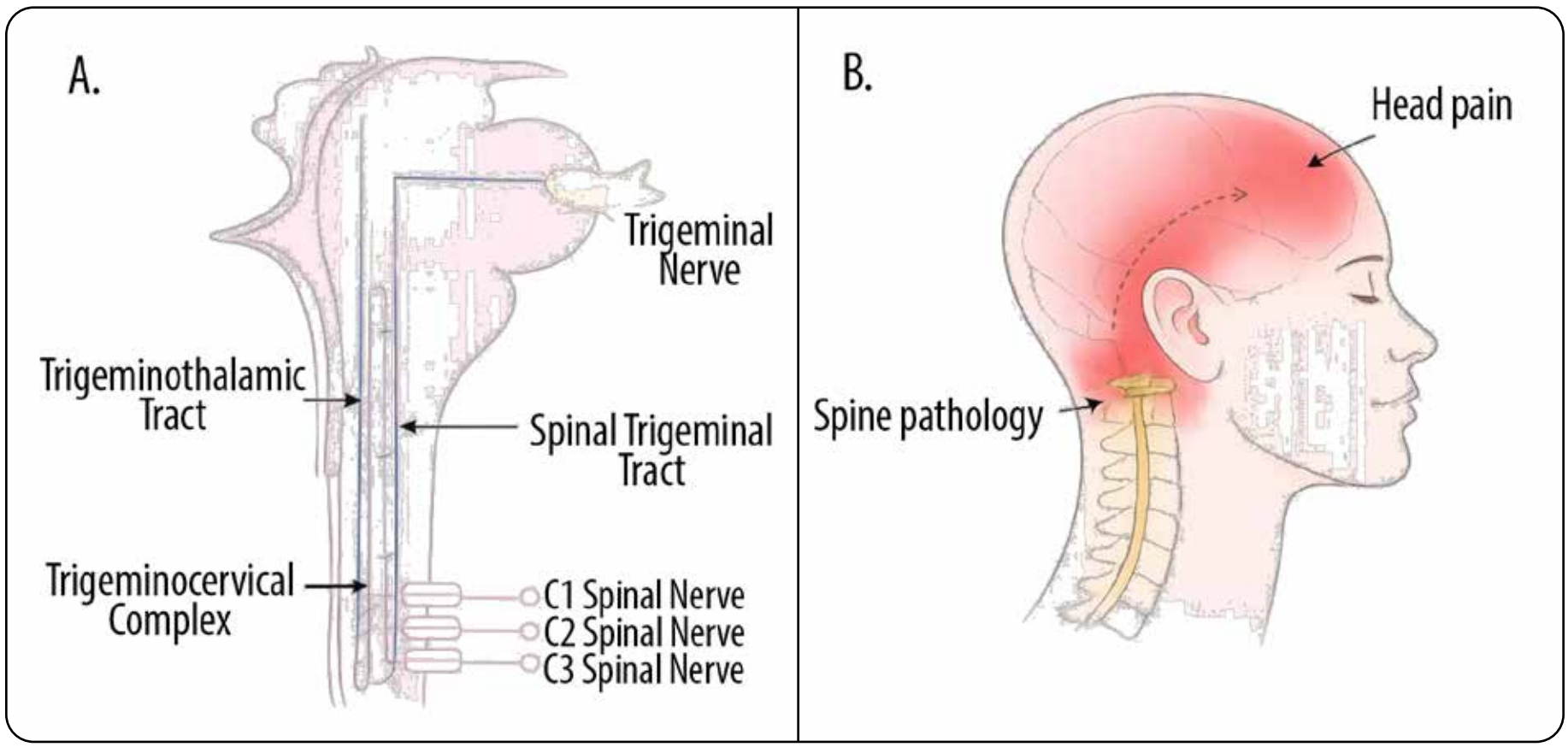

Figure 1. Convergence of nociceptive afferents from the upper cervical spinal nerves and the trigeminal nerve causing referred head pain. (A) Schematic of the trigeminocervical complex within the brainstem. (B) Schematic of referred frontal pain radiating from the back of the head and caused by an upper cervical spine source. Image generated with the prompt "Upper cervical spine and referred pain referred to frontal region" (GPT-5.2, OpenAI, 2026) and subsequently modified, formatted and labelled.

Prevention

Modifiable factors, such as smoking, physical activity, and sleep, generally support spinal health and may reduce the pathology associated with cervicogenic headache. Smoking causally increases risk of disc degeneration and herniation,[9] making smoking cessation an important modifiable behavior in symptoms attributable to any spinal pathology. Increased physical activity is associated with markers of disc health,[10] and is a part of maintaining healthy weight which is independently important for spine health.[11] As compared to people with insomnia, maintaining sleep hygiene may be protective for disc health.[9] Multiple social factors, such as higher education,[12] and household income,[9] are associated with spine health, likely through mediating factors such as access to care.

Prevention of cervicogenic headache may focus on minimizing behaviours that contribute to cervical spine strain. Sustained neck flexion and repetitive loading from poor posture increase cervical musculoskeletal strain,[13,14] which in turn may elevate susceptibility to cervicogenic headache. Forward head posture increases compressive and shear forces across the upper cervical spine,[15–17] which are relevant to cervicogenic headache.

Prolonged computer, smartphone, and videogame use are frequently implicated as triggers or contributors to cervicogenic headache. Studies suggest that using mobile devices for more than 4–6 hours per day, or maintaining a flexed neck posture, significantly increases the risk of neck pain among university students, office workers, and young adults.[18–20] Video-games were also independently identified as a risk factor for neck strain in college students.[21] Smartphone use has been linked to neck pain and headache symptoms, especially in younger populations so often that it has been given the colloquial term “text neck”.[22] Epidemiologic and observational studies identify prolonged neck flexion during screen-based activities as the likely mechanism behind this association.

Most studies on posture and preventable behaviours do not specify the diagnostic criteria used for headache classification and often rely on self-reported symptoms, without clearly distinguishing cervicogenic headache from migraine or tension-type headache. Most available data are cross-sectional, which makes it challenging to define causality. Importantly, most individuals with high screen exposure do not develop cervicogenic headache, suggesting these associations with posture alone is insufficient and that individual susceptibility, prior neck injury, ergonomic setup, and protective behaviors (e.g., movement breaks, exercise) may be important factors. While reducing screen time alone is unlikely to resolve cervico-

genic headache, addressing how the cervical spine is supported remains a low-risk part of management. Future longitudinal studies using standardized diagnostic criteria are needed to better define causality. Collectively these studies suggest addressing modifiable behavioral and ergonomic factors that contribute to spine health are important considerations in the management of cervicogenic headache.

Diagnosis

Cervicogenic headache can be challenging to diagnose.[23] Consensus guidelines from the ICHD and Cervicogenic Headache International Study Group (CHISG) suggest cervicogenic headache typically demonstrate the following criteria: 1) a unilateral headache, 2) associated with reduced cervical mobility and 3) demonstrate reproduction of pain with compression.[24] They may mimic primary headache disorders such as migraine, tension-type headache or hemicrania continua.[25] Despite presentation similarities, certain clinical features can be useful in distinguishing them (Table 1). In cervicogenic headache, pain

Table 1: Summary Headache Disorders with Clinical Overlap with Cervicogenic Headache

	Key Features	Diagnosis ICHD-3 criteria	Management	References
Hemicrania continua	Continuous, autonomic features	Response to indomethacin	Indomethacin (first-line)	29
Migraine	Pulsatile, nausea/ vomiting (N/V) photophobia	At least 5 attacks N/V or photo/ phonophobia	NSAIDs, triptans, gepants; antihypertensives, antiepileptics, antidepressants, CGRP mAbs♦, onabotulinumtoxin A	30-32
Tension-type headache	Bilateral pressing or tightening	At least 10 attacks lasting hours to days	Acetaminophen, ibuprofen, lifestyle, TCAs♠ for prevention	30,33
Cervicogenic headache	Unilateral pain worse with neck movement. Less cervical ROM Pain with palpation	Laterality ROM Palpation Nerve blocks	Physical therapy (manual), over-the-counter analgesia, lifestyle modifications. RF ablation.	34-36

♦ CGRP mAbs = Calcitonin gene-related peptide monoclonal antibodies
♠ TCAs = Tricyclic antidepressants

most often radiates anteriorly to the frontal and temporal regions, with frontal involvement being a common feature.[26] A positive cervical flexion–rotation test (Figure 2), a provocative maneuver assessing upper cervical mobility, may provide supportive clinical evidence distinguishing cervicogenic headache from other headache types.[27] A history of neck trauma (e.g., whiplash) is common in people with cervicogenic headache,[5] the headache may be associated with reduced neck mobility and may worsen with neck movement or pressure.[4,28]

Diagnosis of cervicogenic headache is further supported by a positive response to conservative treatments, such as occupational therapy and physical therapy. According to the American College of Radiology (ACR) appropriateness criteria, if there are no red flag symptoms then imaging is not recommended.[2] In the absence of response to conservative management, the gold standard for confirming a cervical source of headache is controlled diagnostic blocks of cervical joints or nerves, which can transiently relieve headache when the cervical structure is causative. This approach is reserved for cases where clinical and physical findings strongly

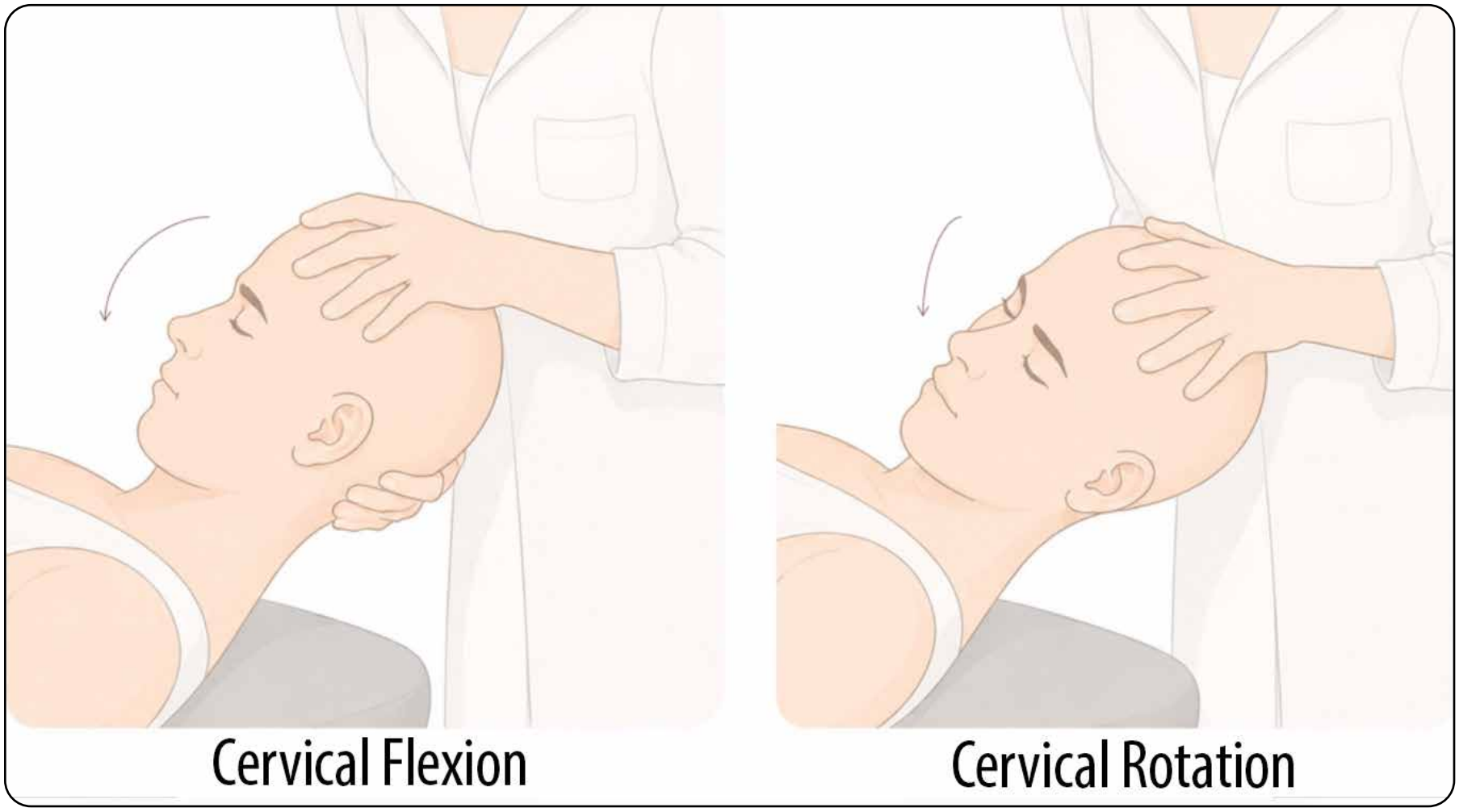

Figure 2. Schematic of the cervical flexion–rotation test. In the first panel, the examiner passively flexes the patient's cervical spine to isolate upper cervical motion. In the second panel, the examiner rotates the head while maintaining cervical flexion to reproduce symptoms of cervicogenic headache. Image generated using the prompt "Turn this image into a schematic" (GPT-5.2, OpenAI, 2026) with photo by OrthoFixar © 2026 subsequently modified, formatted and labelled.

suggest cervicogenic headache and other etiologies have been excluded.[37,38]

Indications for diagnostic nerve blocks include: a strong suspicion of a cervical pain generator (concomitant neck symptoms, findings on imaging obtained for other symptoms, lack of treatment response anticipated by other headache types), failure of conservative management, and when identifying the pain generator is necessary to guide further interventions such as radiofrequency ablation.[39,40] If imaging strongly suggests a cervical source (e.g., there is severe facet joint degeneration, or disc herniation in the upper cervical spine), diagnostic nerve block may also be considered when headache is the dominant complaint.[41] Nerve blocks are not first-line and should follow comprehensive assessment, as clinical diagnosis alone is often sufficient in many cases.[34,41]

Contraindications to diagnostic nerve blocks include allergy to local anesthetic, infection at the injection site, coagulopathy, and inability to safely access the target. Relative contraindications may include anticoagulant therapy or active systemic illness.[39,42] More common complications include transient pain, hematoma and dizziness. Rare but serious complications such as infection or acute cerebellar syndrome have been reported, underscoring the importance of sterile technique and careful patient selection.[39,42,43]

Interventional pain specialists typically perform diagnostic nerve blocks. These specialists may be anesthesiologists, physiatrists, or neurologists, with procedural training to perform these blocks which require fluoroscopic or ultrasound guidance.[44] To block cervicogenic headache, the most common targets are the third occipital nerve, the greater occipital nerve, and the C2 dorsal root ganglion (Figure 3). The C2–3 zygapophysial joint is implicated in most cervicogenic headache cases, with the lateral atlanto-axial joint and C3–4 joint less frequently involved.[2,37,38] Results from these diagnostic blocks can inform treatment options. For example, radiofrequency neurotomy is only indicated for headache stemming from the C2–3 zygapophysial joint if complete relief is achieved after third occipital nerve block.[37,9]

Management

First-line treatment for cervicogenic headache is multimodal conservative management including manual physical therapy, exercise and patient education. Recent evidence from 3 randomized-controlled trials suggests that orthopaedic manual physical therapy provides some short term headache relief for up to 3 months.[46] In contrast to exercise physical therapy, which focuses on strength

and reducing neck-related disability, manual physical involves manual manipulation by a physical therapist to mobilize joints and soft tissues.[47] Combined interventions (e.g., manipulation plus dry needling) are supported for reducing headache frequency and intensity in the short term.[48] Neck exercise is effective for range of motion improvement and possibly long-term reduction in headache intensity. Combined approaches (manual therapy plus exercise) may be beneficial, though certainty of evidence is low and further research is needed.[49]

Currently there is a lack of evidence to support the efficacy of a pharmacologic intervention for cervicogenic headache.[38,40,50] Patients with a cervicogenic headache that is refractory to conservative management and confirmed with diagnostic nerve blocks may consider invasive procedures for pain relief.

Patients with diagnostic confirmation who are still suffering with function-limiting pain may be candidates for therapeutic radiofrequency ablation. The literature emphasizes radiofrequency neurotomy of the facet joints as the preferred interventional approach for cervicogenic headache refractory to conservative management.[35,51–54] Standard radiofrequency ablation of the cervical facet joints,

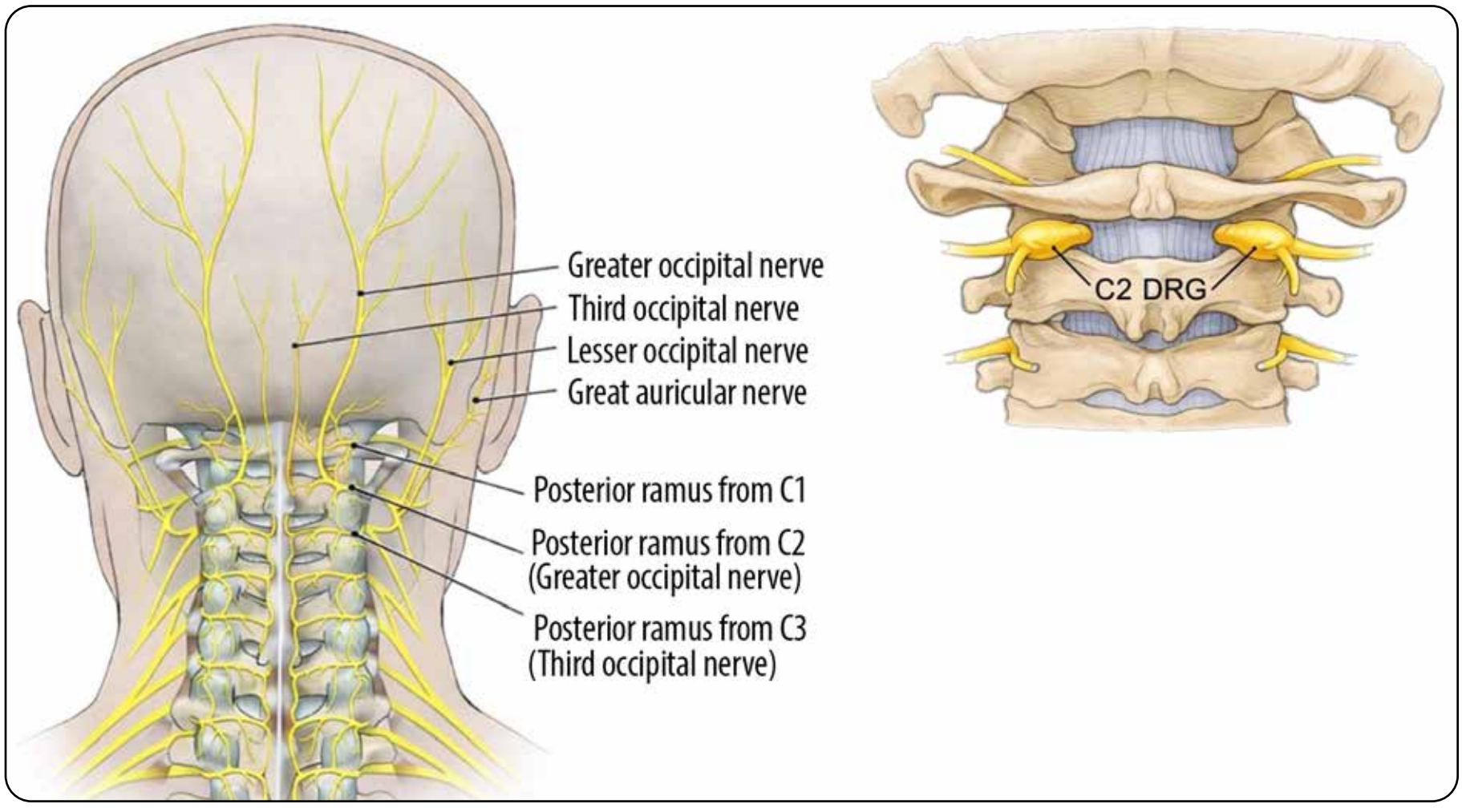

Figure 3. Occipital nerve anatomy and C2 dorsal root ganglion. (A) Posterior view of the scalp demonstrating the distribution of the greater, third, and lesser occipital nerves and their cervical origins. (B) Schematic of the C2 dorsal root ganglion, highlighting its anatomical relationship to the cervical vertebrae. Figure adapted from Chen et al., and the Facial Pain Association © 2002-2024.[45]

especially at C2–C3, has provided patients with pain relief for up to 1 year, and pulsed radiofrequency may provide longer lasting effects and a favorable safety profile.[40,51,52] Pulsed radiofrequency of the occipital nerves may offer pain control, particularly in cases with occipital neuralgia overlap.[40]

For cervicogenic headache mediated through the C2-3 disc, there may be some evidence to support treatment with CT-guided radiofrequency ablation. A single study of 44 patients suggested efficacy of CT-guided ablation, with patients achieving significant pain reduction and a high rate of pain relief at 6 months (≥50%), with multi-level ablation yielding greater benefit.[53] Similarly, CT-guidance has been used for radiofrequency ablation of the C2 dorsal root ganglion (DRG) to treat cervicogenic headache. This case series proposed the efficacy and technical safety of ablation of the C2 DRG but only had only 11 patients with lateral atlantoaxial joint pathology.[54] Radiofrequency ablation may provide relief on the order of 6–12 months, although some patients experience longer benefit.[55] In the limited cervicogenic headache literature, follow-up is generally up to 6 months, so longer-term recurrence rates remain uncertain. Studies of larger cohorts with longer follow-up will be needed to further assess the efficacy of radiofrequency ablation.

Currently there is insufficient evidence to support the recommendation of surgical management when cervicogenic headache is the primary concern. Published case studies report trials of spinal cord stimulation (SCS),[56–58] and percutaneous endoscopic neurotomy,[59] used when radiofrequency ablation does not successfully treat the pain, but this is not supported by enough high-quality evidence. The evidence for SCS in cervical pain and cervicogenic headache is limited to small observational studies and case series without high-quality randomized controlled trials specifically targeting cervicogenic headache. Other surgical approaches such as anterior cervical fusion for discogenic pain or arthrodesis for lateral atlantoaxial joint pain would only be appropriate when indicated by accompanying symptoms such as severe radicular pain, myelopathy and/or mechanical neck pain that aligns with radiographic abnormality.[2] Multiple cases exist where cervicogenic headaches has been treated after anterior cervical discectomy and fusion (ACDF).[60] Trials of novel treatment modalities such as occipital nerve stimulation,[40] or transcranial direct current stimulation in cervicogenic headache are underway, but reliable evidence as to their efficacy for providing relief remains to be reported.[61]

Invasive diagnostic and therapeutic interventions for cervico-

genic headache should be reserved for carefully selected patients and undertaken within a multidisciplinary framework. Accurate clinical assessment, correlation with imaging when appropriate, and consideration of conservative management remain essential before proceeding with invasive measures.

Conclusion

Recognizing cervicogenic headache ensures patients receive targeted, spine-focused care that can meaningfully improve both symptoms and understanding of their condition. Prevention focuses on addressing modifiable risk factors through posture, exercise and lifestyle modifications. Lifestyle modifications include smoking cessation, sleep hygiene, exercise and ergonomic optimization.[36,62] Diagnosis of cervicogenic headache primarily relies on clinical criteria including unilateral headache, reduced cervical range of motion, pain with palpation and provocation by neck movement or sustained postures.[5,38] The cervical flexion-rotation test demonstrates diagnostic accuracy in differentiating cervicogenic headache from other headache types.[27]

Recognizing cervicogenic headache allows clinicians to direct care toward the cervical spine, offering patients a clearer diagnosis, more targeted treatment, and a meaningful opportunity for symptom relief. Multimodal conservative management remains the mainstay of treatment, and has demonstrated superior efficacy compared to pharmacological interventions.[48,63] Evidence supports manual therapy (e.g., manipulation, mobilization) combined with exercise as first-line treatment, with interventional options including anesthetic blocks, corticosteroid injections, and radiofrequency denervation for refractory cases.[35,36,62]

KEY POINTS

- Cervicogenic headaches are secondary headaches that originate from pathology in the upper cervical spine for which headache relief can be achieved through spine-focused therapy.
- Prevention of cervicogenic headache involves addressing modifiable factors that support spinal health, including smoking cessation, regular physical activity, maintaining a healthy weight and adequate sleep.
- Diagnosis of cervicogenic headache is primarily clinical and may be supported by response to targeted cervical interventions, including manual physical therapy or diagnostic nerve blocks.
- Treatment of cervicogenic headache is primarily conservative and multimodal, with the strongest evidence supporting manual physical therapy. Radiofrequency ablation may be considered in select cases, evidence for other interventions remains limited.

CLINICAL PEARLS

- The cervical flexion–rotation test selectively assesses C1–C2 mobility and is a quick, low-risk bedside maneuver. Marked asymmetry or reproduction of the patient's familiar headache during the test strongly supports an upper cervical pain generator.
- While not diagnostic, reproduction of a patient's headache with firm palpation or sustained pressure over the upper cervical spine or suboccipital region can support a cervical source of pain.
- Many patients with cervicogenic headache are individuals with prolonged, static neck positions such as smartphone-related neck flexion or "text neck". A history of neck injury is also common.

References

1. Robinson CL, Christensen RH, Al-Khazali HM, et al. Prevalence and relative frequency of cervicogenic headache in population- and clinic-based studies: A systematic review and meta-analysis. Cephalalgia. 2025;45(3):03331024251322446. doi:10.1177/03331024251322446
2. Eldaya RW, Parsons MS, Hutchins TA, et al. ACR Appropriateness Criteria® Cervical Pain or Cervical Radiculopathy: 2024 Update. J Am Coll Radiol. 2025;22(5):S136-S162.
3. Xu Y, Gao Y, Jiang L, et al. Global trends in research on cervicogenic headache: a bibliometric analysis. Front Neurol. 2023;14. doi:10.3389/fneur.2023.1169477
4. Bogduk N, Govind J. Cervicogenic headache: an assessment of the evidence on clinical diagnosis, invasive tests, and treatment. Lancet Neurol. 2009;8(10):959-968. doi:10.1016/S1474-4422(09)70209-1
5. Piovesan EJ, Utiumi MAT, Grossi DB. Cervicogenic headache - How to recognize and treat. Best Pract Res Clin Rheumatol. 2024;38(1):101931. doi:10.1016/j.berh.2024.101931
6. Narouze S. C2 dorsal root ganglion: the central hub for cervicogenic headache. Curr Opin Anaesthesiol. 2025;38(5):689-693. doi:10.1097/ACO.0000000000001564
7. Sjaastad O, Saunte C, Hovdahl H, Breivik H, Grønbâk E. "Cervicogenic" Headache. An Hypothesis. Cephalalgia. 1983;3(4):249-256. doi:10.1046/j.1468-2982.1983.0304249.x
8. Olesen J. The International Classification of Headache Disorders: History and future perspectives. Cephalalgia Int J Headache. 2024;44(1):3331024231214731. doi:10.1177/03331024231214731
9. Guo W, Li BL, Zhao JY, Li XM, Wang LF. Causal associations between modifiable risk factors and intervertebral disc degeneration. Spine J. 2024;24(2):195-209.
10. Owen PJ, Hangai M, Kaneoka K, Rantalainen T, Belavy DL. Mechanical loading influences the lumbar intervertebral disc. A cross-sectional study in 308 athletes and 71 controls. J Orthop Res Off Publ Orthop Res Soc. 2021;39(5):989-997. doi:10.1002/jor.24809
11. Zeng B, Xu S, Zhou D, et al. Unraveling the causal landscape of intervertebral disc degeneration: A Mendelian randomization analysis of 108 traits. Medicine (Baltimore). 2025;104(49):e45603.
12. Liu C, Ran J, Hou B, Li Y, Morelli JN, Li X. Causal effects of body mass index, education, and lifestyle behaviors on intervertebral disc disorders: Mendelian randomization study. J Orthop Res. 2024;42(1):183-192. doi:10.1002/jor.25656
13. Phuyal N, Pandey N, Pandeya A, Mishra AK. Smartphone overuse and its impact on musculoskeletal pain in the neck and wrists/hands in medical and nursing undergraduate students: a cross-sectional study. Sci Rep. 2025;15(1):44945. doi:10.1038/s41598-025-29317-3
14. Meng Y, Xue Y, Yang S, Wu F, Dong Y. The associations between sedentary behavior and neck pain: a systematic review and meta-analysis. BMC Public Health. 2025;25:453. doi:10.1186/s12889-025-21685-9
15. Hansraj KK. Assessment of stresses in the cervical spine caused by posture and position of the head. Surg Technol Int. 2014;25(25):277-279.
16. Sarraf F, Varmazyar S. Comparing the effect of the posture of using smartphones on head and neck angles among college students. Ergonomics. 2022;65(12):1631-1638. doi:10.1080/00140139.2022.2047229
17. Suzuki H, Ohara Y, Iwata M, Asai Y, Matsuo S. Relationship between the degree of forward head posture and the shear elastic modulus of the upper trapezius in young men, and the difference in these variables between those with and without neck/shoulder pain and/or stiffness. J Phys Ther Sci. 2025;37(6):250-255.

18. Phuyal N, Pandey N, Pandeya A, Mishra AK. Smartphone overuse and its impact on musculoskeletal pain in the neck and wrists/hands in medical and nursing undergraduate students: a cross-sectional study. Sci Rep. 2025;15(1):44945.
19. Elvan A, Cevik S, Vatansever K, Erak I. The association between mobile phone usage duration, neck muscle endurance, and neck pain among university students. Sci Rep. 2024;14(1):20116.
20. Blumenberg C, Wehrmeister FC, Barros FC, et al. Association of the length of time using computers and mobile devices with low back, neck and mid-back pains: findings from a birth cohort. Public Health. 2021;195:1-6.
21. Gao Y, Chen Z, Chen S, Wang S, Lin J. Risk factors for neck pain in college students: a systematic review and meta-analysis. BMC Public Health. 2023;23(1):1502. doi:10.1186/s12889-023-16212-7
22. Grasser T, Borges Dario A, Parreira PCS, Correia IMT, Meziat-Filho N. Defining text neck: a scoping review. Eur Spine J. 2023;32(10):3463-3484.
23. Arnold M. Headache classification committee of the international headache society (IHS) the international classification of headache disorders. Cephalalgia. 2018;38(1):1-211.
24. Bogduk N, Govind J. Cervicogenic headache: an assessment of the evidence on clinical diagnosis, invasive tests, and treatment. Lancet Neurol. 2009;8(10):959-968.
25. Mathew PG, Sailesh S. A Pain in the Neck: Occipital Neuralgia vs. Cervicogenic Headache vs. Migrainous Cervicalgia. Curr Pain Headache Rep. 2025;29(1):101. doi:10.1007/s11916-025-01419-7
26. Antonaci F, Sjaastad O. Cervicogenic headache: a real headache. Curr Neurol Neurosci Rep. 2011;11(2):149-155.
27. 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
28. Antonaci F, Inan LE. Headache and neck. Cephalalgia. 2021;41(4):438-442. doi:10.1177/0333102420944878
29. Diener HC, Tassorelli C, Dodick DW. Management of trigeminal autonomic cephalalgias including chronic cluster: a review. JAMA Neurol. 2023;80(3):308-319.
30. Robbins MS. Diagnosis and management of headache: a review. Jama. 2021;325(18):1874-1885.
31. Hus AK, Xu YY, Steinmetz JD, et al. Global, regional, and national burden of headache disorders, 1990–2023: a systematic analysis for the Global Burden of Disease Study 2023. Lancet Neurol. 2025;24(12):1005-1015.
32. Ashina M. Migraine. N Engl J Med. 2020;383(19):1866-1876. doi:10.1056/NEJMra1915327
33. Ashina S, Mitsikostas DD, Lee MJ, et al. Tension-type headache. Nat Rev Dis Primer. 2021;7(1):24.
34. Jull G. Cervicogenic headache. Musculoskelet Sci Pract. 2023;66:102787. doi:10.1016/j.msksp.2023.102787
35. Lefel N, Van Suijlekom H, Cohen SPC, Kallewaard JW, Van Zundert J. 11. Cervicogenic headache and occipital neuralgia. Pain Pract. 2025;25(1):e13405. doi:10.1111/papr.13405
36. Cropes M, Deacon A, Nelson EO, et al. Exploring Pain Phenotyping in Cervicogenic Headache Management. Curr Pain Headache Rep. 2025;29(1):122. doi:10.1007/s11916-025-01420-0
37. Govind J, Bogduk N. Sources of cervicogenic headache among the upper cervical synovial joints. Pain Med. 2022;23(6):1059-1065.
38. Bogduk N, Govind J. Cervicogenic headache: an assessment of the evidence on clinical diagnosis, invasive tests, and treatment. Lancet Neurol. 2009;8(10):959-968. doi:10.1016/S1474-4422(09)70209-1
39. 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;21(5):591-597. doi:10.1080/14737175.2021.1903320
40. Lefel N, van Suijlekom H, Cohen SPC, Kallewaard JW, Van Zundert J. 11. Cervicogenic headache and occipital neuralgia. Pain Pract Off J World Inst Pain. 2025;25(1):e13405. doi:10.1111/papr.13405
41. McDonald MA, Kirsch CF, Amin BY, et al. ACR Appropriateness Criteria® cervical neck pain or cervical radiculopathy. J Am Coll Radiol. 2019;16(5):S57-S76.
42. Castillo-Álvarez F, Hernando de la Bárcena I, Marzo-Sola ME. Greater occipital nerve block in the treatment of headaches. Review of evidence. Med Clin (Barc). 2023;161(3):113-118. doi:10.1016/j.medcli.2023.04.001
43. Stern JI, Chiang CC, Kissoon NR, Robertson CE. Narrative review of peripheral nerve blocks for the management of headache. Headache. 2022;62(9):1077-1092. doi:10.1111/head.14385
44. Hurley RW, Adams MCB, Barad M, et al. Consensus practice guidelines on interventions for cervical spine (facet) joint pain from a multispecialty international working group. Reg Anesth Pain Med. 2022;47(1):3-59. doi:10.1136/rapm-2021-103031
45. Q2 approach for percutaneous peripheral neuromodulation stimulator implantation targeting the C2 dorsal root ganglion at the C2 lamina for treatment of intractable headache: a technical note | Pain Medicine | Oxford Academic. Accessed April 17, 2026. https://academic.oup.com/painmedicine/article/26/3/140/7888892?login=false&guestAccessKey=
46. Martins L, Collet P, Lafrance S, Demont A. Efficacy of nonsurgical interventions for the management of adults with cervicogenic headache: a systematic review and meta-analyses. Ann Phys Rehabil Med. 2026;69(4):102070. doi:10.1016/j.rehab.2025.102070
47. Silvernail JL, Deyle GD, Jensen GM, et al. Orthopaedic Manual Physical Therapy: A Modern Definition and Description. Phys Ther. 2024;104(6):pzae036. doi:10.1093/ptj/pzae036
48. Jung A, Carvalho GF, Szikszay TM, Pawlowsky V, Gabler T, Luedtke K. Physical Therapist Interventions to Reduce Headache Intensity, Frequency, and Duration in Patients With Cervicogenic Headache: A Systematic Review and Network Meta-Analysis. Phys Ther. 2024;104(2):pzad154. doi:10.1093/ptj/pzad154

49. Demont A, Lafrance S, Gaska C, Kechichian A, Bourmaud A, Desmeules F. Efficacy of physiotherapy interventions for the management of adults with cervicogenic headache: A systematic review and meta-analyses. PM R. 2023;15(5):613-628. doi:10.1002/pmrj.12856
50. Koonalinthip N, Koonalintip P, Stonsaovapak C. The Comparative Efficacy of Treatments for Cervicogenic Headache: A Systematic Review and Network Meta-Analysis of Randomised Controlled Trials. Eur J Pain. 2026;30(2):e70219. doi:10.1002/ejp.70219
51. Park MS, Choi HJ, Yang JS, Jeon JP, Kang SH, Cho YJ. Clinical Efficacy of Pulsed Radiofrequency Treatment Targeting the Mid-cervical Medial Branches for Intractable Cervicogenic Headache. Clin J Pain. 2021;37(3):206-210. doi:10.1097/AJP.0000000000000911
52. Bing N, Tao D, Wei S, Guang L, Hongwei Z. Percutaneous Endoscopic C2-C3 Medial Branches Neurotomy for Cervicogenic Headache. World Neurosurg. 2019;126:498-501. doi:10.1016/j.wneu.2019.03.072
53. Hu JQ, Zhang J, Ru B, et al. Computed tomography-guided radiofrequency ablation of cervical intervertebral discs for the treatment of refractory cervicogenic headache: A retrospective chart review. Headache. 2022;62(7):839-847. doi:10.1111/head.14361
54. Chazen JL, Roytman M, Yoon ES, Mullen TK, Lebl DR. CT-Guided C2 Dorsal Root Ganglion Radiofrequency Ablation for the Treatment of Cervicogenic Headache: Case Series and Clinical Outcomes. AJNR Am J Neuroradiol. 2022;43(4):575-578. doi:10.3174/ajnr.A7471
55. Hamer JF, Purath TA. Response of cervicogenic headaches and occipital neuralgia to radiofrequency ablation of the C2 dorsal root ganglion and/or third occipital nerve. Headache. 2014;54(3):500-510. doi:10.1111/head.12295
56. Finnern MT, D'Souza RS, Jin MY, Abd-Elsayed AA. Cervical Spinal Cord Stimulation for the Treatment of Headache Disorders: A Systematic Review. Neuromodulation J Int Neuromodulation Soc. 2023;26(7):1309-1318. doi:10.1016/j.neurom.2022.10.060
57. Krog L, Maloney J, Pew S, et al. Cervical Spinal Cord Stimulation: A Review. Curr Pain Headache Rep. 2024;28(4):239-249. doi:10.1007/s11916-023-01200-8
58. Towne BV, Girgiss CB, Schuster NM. Use of spinal cord stimulation in treatment of intractable headache diseases. Pain Med. 2023;24(Suppl 2):S6-S10. doi:10.1093/pm/pnad090
59. Bing N, Tao D, Wei S, Guang L, Hongwei Z. Percutaneous Endoscopic C2-C3 Medial Branches Neurotomy for Cervicogenic Headache. World Neurosurg. 2019;126:498-501. doi:10.1016/j.wneu.2019.03.072
60. Yang L, Li Y, Dai C, et al. Anterior cervical decompression and fusion surgery for cervicogenic headache: A multicenter prospective cohort study. Front Neurol. 2022;13:1064976. doi:10.3389/fneur.2022.1064976
61. Jobin K, Smith A, Campbell C, et al. The safety and feasibility of transcranial direct current stimulation and exercise therapy for the treatment of cervicogenic headaches: A randomized pilot trial. Headache J Head Face Pain. 2025;65(5):845-862. doi:10.1111/head.14887
62. Côté P, Yu H, Shearer HM, et al. Non-pharmacological management of persistent headaches associated with neck pain: A clinical practice guideline from the Ontario protocol for traffic injury management (OPTIMa) collaboration. Eur J Pain. 2019;23(6):1051-1070. doi:10.1002/ejp.1374
63. Koonalinthip N, Koonalintip P, Stonsaovapak C. The Comparative Efficacy of Treatments for Cervicogenic Headache: A Systematic Review and Network Meta-Analysis of Randomised Controlled Trials. Eur J Pain. 2026;30(2):e70219. doi:10.1002/ejp.70219