



KAISER PERMANENTE®

Mid-Atlantic States

Spinal Cord Stimulation for Pain Management

Medical Coverage Policy

UTILIZATION * ALERT*

- Prior to use of this MCP for evaluation of medical necessity, benefit coverage **MUST** be verified in the member's EOC or benefit document.
 - For Medicare members, please refer to CMS guidelines through Medicare Coverage Database requirements.
 - If, after searching the Medicare Coverage Database, no NCD/LCD/LCA is found, please use this KP-MAS Medical Coverage Policy for coverage guidelines for Medicare members.
-

- I. **Procedure: Spinal Cord Stimulation for Pain Management**
- II. **Diagnosis:** Chronic Neuropathic Pain, Angina Pectoris
- III. **Specialties:** Pain Management, Cardiology
- IV. **Clinical Indications for Neurological Pain Referral**
 - A. Kaiser Permanente Mid-Atlantic States considers spinal cord stimulation (SCS) to be medically indicated for the treatment of chronic neurological pain, of at least six months duration, due to:
 1. Failed back surgery syndrome with predominant low back pain and secondary radicular pain;
 2. Neck pain and radicular pain involving the upper extremities;
 3. Complex regional pain syndrome, e.g., chronic neuropathic pain; **or**
 4. Inoperable chronic ischemic limb pain secondary to peripheral vascular disease
 - B. Spinal Cord Stimulation for neurological pain is indicated when **ALL** the following criteria are met, and procedures are completed.
 1. Failure of at least **6 months** of conventional multi-disciplinary medical and surgical pain management to include at least **4** of the following:
 - a. Pharmacological therapies;
 - b. Physical Therapy or Occupational Therapy, as applicable;
 - c. Behavioral therapies (such as cognitive behavioral therapy);
 - d. Alternative therapies (i.e., chiropractic manipulation and acupuncture);
 - e. Nerve blocks (i.e., medial branch blocks, radiofrequency ablation);
 - f. Major joint injections (i.e., sacroiliac joint injections, hip injections);
 - g. Epidural steroid injections;
 - h. Intrathecal infusion pumps; **and**
 - i. Surgical procedures
 2. Completed a behavioral health screening to rule out an inadequately controlled mental health



KAISER PERMANENTE®

Mid-Atlantic States

Spinal Cord Stimulation for Pain Management

Medical Coverage Policy

condition or drug addiction; **and**

3. Completed a 3 to 7-day trial of a temporarily implanted electrode demonstrating at least a 50% reduction in pain.

C. Trial of Temporary external electrode placement criteria for neurological pain

For a member to undergo a trial of temporary implanted electrode they must meet criteria **section IV, B.1 and section IV, B.2 above.**

V. Clinical Indications for Cardiac Referral

A. Kaiser Permanente Mid-Atlantic States considers spinal cord stimulation for the treatment of chronic stable angina pain to be medically indicated when ALL the following criteria are met:

1. New York Heart Association (NYHA) Functional Class III or IV angina;
2. A significant coronary artery disease documented through angiogram and not a candidate for revascularization;
3. Reversible ischemia is demonstrated by a symptom-limited treadmill stress test;
4. Optimal pharmacotherapy for at least one month. Optimal pharmacotherapy includes the maximal tolerated dosages of at least two of the following anti-anginal medications: long-acting nitrates, beta-adrenergic blockers, or calcium channel antagonists;
5. Demonstration of at least a 50% reduction in pain from a 3 to 7- day trial of a temporary external electrode;
6. No history of myocardial infarction or unstable angina 3 months prior to treatment; **and**
7. No significant valve abnormalities on echocardiogram.

B. Trial of temporary external electrode criteria for cardiac pain

For a member to undergo a trial of temporary external electrode they must meet all the criteria in section **V, A** above.



KAISER PERMANENTE®

Mid-Atlantic States

Spinal Cord Stimulation for Pain Management

Medical Coverage Policy

References

1. Elbasiouny, Sherif, PhD, Moroz, Daniel, Bakr, Mohamed, MD, Management of Spasticity after Spinal Cord Injury: Current Techniques and Future Directions. *Neurorehabilitation and Neural Repair* 2010; 24(1):23-33.
2. Flagg A. Spinal cord stimulation in the treatment of cancer-related pain: "back to the origins". *Curr Pain Headache Rep* Aug 2012; 16(4): 343-9.
3. Gharibo C, Christopher; Laux G, Forzani BR, Sellars C, Kim E, Zou S. State of the field survey: spinal cord stimulator use by academic pain medicine practices. *Pain medicine*. Feb 2014. 15(2): 188-95.
4. Kapural L, et al. Technical aspects of spinal cord stimulation for managing chronic visceral abdominal pain: the results from the national survey. *Pain Medicine* 2010; 11(5):685-91.
5. Kelly G.A. The impact of spinal cord stimulation on physical function and sleep quality in individuals with failed back surgery syndrome: a systematic review. - *Eur J Pain* Jul 2012; 16(6): 793-802.
6. Medicare Coverage Database. LCD L35450, Spinal Cord Stimulation. Accessed 06/17/2016.
7. Medicare Coverage Database. National Coverage Determination (NCD) for Electrical Nerve Stimulators (160.7). Accessed 08/23/2019.
<https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCDId=240&ncdver=1&DocID=160.7&bc=qAAAABAAAA&>
8. Mekhail NA. Retrospective review of 707 cases of spinal cord stimulation: indications and complications. - *Pain Pract* Mar 2011; 11(2): 148-53.
9. Poree L. Spinal cord stimulation as treatment for complex regional pain syndrome should be considered earlier than last resort therapy. *Neuromodulation* Mar 2013; 16(2): 125-41.
10. Ramasubbu C. Principles of electrical stimulation and dorsal column mapping as it relates to spinal cord stimulation: an overview. *Curr Pain Headache Rep* Feb 2013; 17(2): 315
11. Reverberi C. Spinal cord stimulation (SCS) in conjunction with peripheral nerve field stimulation (PNfS) for the treatment of complex pain in failed back surgery syndrome (FBSS). *Neuromodulation* Jan 2013; 16(1): 78-82; discussion 83.
12. Smits H. Experimental spinal cord stimulation and neuropathic pain: mechanism of action, technical aspects, and effectiveness. - *Pain Pract* Feb 2013; 13(2): 154-68.
13. Song JJ, Popescu A, Bell RL. *Present and potential use of spinal cord stimulation to control chronic pain*. *Pain Physician* May 2014. 17(3): 235-46.
14. Yakovlev AE. Spinal cord stimulation for cancer-related low back pain. - *Am J Hosp Palliat Care* – Mar 2012; 29(2): 93-7.
15. Tshomba, Yamume; Psacharopulo, Daniele; Frezza, Serena; Marone, Enrico Maria; Astore, Domenico; Chiesa, Roberto. Clinical Research: Predictors of Improved Quality of Life and Claudication in Patients Undergoing Spinal Cord Stimulation for Critical Lower Limb Ischaemia. *Annals of Vascular Surgery*. April 2014, 28(3): 628-632 Language: English. DOI 10.1016/j.avsg.2013.06.020.
16. Peng, Lihua; Min, Su; Zejun, Zhou; Wei, Ke; Bennett, Michael I. Spinal cord stimulation for cancer-related pain in adults (Cochrane Review). Cochrane Pain, Palliative and Supportive Care Group: Cochrane Database of Systematic Reviews; Edited/Substantively amended: 02 March 2017: Stable (no update expected for reasons given in 'What's new') this issue. Cochrane Database of Systematic



KAISER PERMANENTE®

Mid-Atlantic States

Spinal Cord Stimulation for Pain Management

Medical Coverage Policy

Reviews.

17. Mohammed F, Shamji, Darcia, Paul, Alina Mednikov. Minimally Invasive Placement of Spinal Cord Stimulator Paddle Electrodes is Associated with Improved Perioperative and Long-Term Experience Among Neuropathic Pain Patients. *SPINE*. Mar 01, 2018, 43(5): 324-330
18. Kapural, L., Gupta, M., Paicius, R., Strodbeck, W., Vorenkamp, K. E., Gilmore, C., Gliner, B., Rotte, A., Subbaroyan, J., & Province-Azalde, R. (2020). Treatment of Chronic Abdominal Pain With 10-kHz Spinal Cord Stimulation: Safety and Efficacy Results From a 12-Month Prospective, Multicenter, Feasibility Study. *Clinical and Translational Gastroenterology*, 2020. February. 11(2), e00133. <https://doi.org/10.14309/ctg.000000000000133>
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7145032/>
19. Head J, Mazza J, Sabourin V, Turpin J, Hoelscher C, Wu C, Sharan A. [Waves of Pain Relief: A Systematic Review of Clinical Trials in Spinal Cord Stimulation Waveforms for the Treatment of Chronic Neuropathic Low Back and Leg Pain](#). *World Neurosurg*. 2019 Nov; 131:264-274.e3. doi: 10.1016/j.wneu.2019.07.167. Epub 2019 Jul 30. PMID: 31369885
<https://www.ncbi.nlm.nih.gov/pubmed/31369885>
20. Levy R, Deer TR, Poree L, Rosen SM, Kapural L, Amirdelfan K, Soliday N, Leitner A, Mekhail N. [Multicenter, Randomized, Double-Blind Study Protocol Using Human Spinal Cord Recording Comparing Safety, Efficacy, and Neurophysiological Responses Between Patients Being Treated With Evoked Compound Action Potential-Controlled Closed-Loop Spinal Cord Stimulation or Open-Loop Spinal Cord Stimulation \(the Evoke Study\)](#). *Neuromodulation*. 2019 Apr;22(3):317-326. doi: 10.1111/ner.12932. Epub 2019 Mar 3. PMID:30828946
<https://www.ncbi.nlm.nih.gov/pubmed/30828946>
21. Mekhail N, Levy RM, Deer TR, Kapural L, Li S, Amirdelfan K, Hunter CW, Rosen SM, Costandi SJ, Falowski SM, Burgher AH, Pope JE, Gilmore CA, Qureshi FA, Staats PS, Scowcroft J, Carlson J, Kim CK, Yang MI, Stauss T, Poree L; Evoke Study Group. [Long-term safety and efficacy of closed-loop spinal cord stimulation to treat chronic back and leg pain \(Evoke\): a double-blind, randomised, controlled trial](#). *Lancet Neurol*. 2020 Feb;19(2):123-134. doi: 10.1016/S1474-4422(19)30414-4. Epub 2019 Dec 20. PMID: 31870766
<https://www.clinicalkey.com#!/content/playContent/1-s2.0-S1474442219304144?returnurl=https:%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS1474442219304144%3Fshowall%3Dtrue&referrer=https:%2F%2Fwww.ncbi.nlm.nih.gov%2Fpubmed%2F31870766>
22. Joosten, E. A., & Franken, G. (2020). Spinal cord stimulation in chronic neuropathic pain: mechanisms of action, new locations, new paradigms. *Pain*, 161 Suppl 1(1), S104–S113.
23. Malige A; Sokunbi G. [Spinal Cord Stimulators: A Comparison of the Trial Period Versus Permanent Outcomes](#). (English) *Spine (Phila Pa 1976)*, ISSN: 1528-1159, 2019 Jun 01; Vol. 44 (11), pp. E687-E692; Publisher: Lippincott Williams & Wilkins; PMID: 30365415, Database: MEDLINE [PubMed](#)
24. Sivanesan, E., Bicket, M. C., & Cohen, S. P. (2019). Retrospective analysis of complications associated with dorsal root ganglion stimulation for pain relief in the FDA MAUDE database. *Regional anesthesia and pain medicine*, 44(1), 100–106. <https://doi.org/10.1136/rapm-2018-000007>
25. Sdrulla, A. D., Guan, Y., & Raja, S. N. (2018). Spinal Cord Stimulation: Clinical Efficacy and Potential



KAISER PERMANENTE®

Mid-Atlantic States

Spinal Cord Stimulation for Pain Management

Medical Coverage Policy

Mechanisms. *Pain practice: the official journal of World Institute of Pain*, 18(8), 1048–1067.

<https://doi.org/10.1111/papr.12692>.

26. Mekhail, N., Levy, R. M., Deer, T. R., Kapural, L., Li, S., Amirdelfan, K., Hunter, C. W., Rosen, S. M., Costandi, S. J., Falowski, S. M., Burgher, A. H., Pope, J. E., Gilmore, C. A., Qureshi, F. A., Staats, P. S., Scowcroft, J., Carlson, J., Kim, C. K., Yang, M. I., Stauss, T., ... Evoke Study Group (2020). Long-term safety and efficacy of closed-loop spinal cord stimulation to treat chronic back and leg pain (Evoke): a double-blind, randomised, controlled trial. *The Lancet. Neurology*, 19(2), 123–134. [https://doi.org/10.1016/S1474-4422\(19\)30414-4](https://doi.org/10.1016/S1474-4422(19)30414-4)
27. Ahmadi, R., Campos, B., Hajiabadi, M.M. *et al.* Efficacy of different spinal cord stimulation paradigms for the treatment of chronic neuropathic pain (PARS-trial): study protocol for a double-blinded, randomized, and placebo-controlled crossover trial. *Trials* 22, 87 (2021). <https://doi.org/10.1186/s13063-020-05013-7>
28. Duarte, R. V., Nevitt, S., Houten, R., Brookes, M., Bell, J., Earle, J., Taylor, R. S., & Eldabe, S. (2023). Spinal Cord Stimulation for Neuropathic Pain in England from 2010 to 2020: A Hospital Episode Statistics Analysis. *Neuromodulation : journal of the International Neuromodulation Society*, 26(1), 109–114. <https://doi.org/10.1016/j.neurom.2022.02.229>
29. Desai, M. J., Salmon, J., Verrills, P., Mitchell, B., Du Toit, N., Bates, D., Vajramani, G., Williams, A., Love-Jones, S., Patel, N., Nikolic, S., Mehta, V., Ahmad, A., Yu, J., Christellis, N., Harkin, S., Baranidharan, G., Levy, R., Staats, P., Malinowski, M. N., ... Mishra, L. N. (2023). A Novel Pulsed Stimulation Pattern in Spinal Cord Stimulation: Clinical Results and Postulated Mechanisms of Action in the Treatment of Chronic Low Back and Leg Pain. *Neuromodulation : journal of the International Neuromodulation Society*, 26(1), 182–191. <https://doi.org/10.1016/j.neurom.2022.10.053>
30. Meier, K., Glavind, J., Milidou, I., Sørensen, J. C. H., & Sandager, P. (2023). Burst Spinal Cord Stimulation in Pregnancy: First Clinical Experiences. *Neuromodulation : journal of the International Neuromodulation Society*, 26(1), 224–232. <https://doi.org/10.1016/j.neurom.2022.03.008>
31. Zhou, P. B., & Bao, M. (2023). Clinical Effect Analysis of Spinal Cord Electrical Stimulator Implantation for Diabetic Foot. *Neuromodulation : journal of the International Neuromodulation Society*, 26(1), 246–251. <https://doi.org/10.1111/ner.13502>
32. Gilligan, C., Volschenk, W., Russo, M., Green, M., Gilmore, C., Mehta, V., Deckers, K., De Smedt, K., Latif, U., Georgius, P., Gentile, J., Mitchell, B., Langhorst, M., Huygen, F., Baranidharan, G., Patel, V., Mironer, E., Ross, E., Carayannopoulos, A., Hayek, S., ... ReActiv8-B Investigators (2023). Long-Term Outcomes of Restorative Neurostimulation in Patients with Refractory Chronic Low Back Pain Secondary to Multifidus Dysfunction: Two-Year Results of the ReActiv8-B Pivotal Trial. *Neuromodulation : journal of the International Neuromodulation Society*, 26(1), 87–97. <https://doi.org/10.1016/j.neurom.2021.10.011>
33. Medicare Coverage Database. LCD L37632, Spinal Cord Stimulation for Chronic Pain. Accessed 07/07/2023. <https://www.cms.gov/medicare-coverage-database/view/lcd.aspx?LCDId=37632>
34. MCG Ambulatory Care 28th edition. Implanted Electrical Stimulator, Spinal Cord ACG: A-0243, (AC). Accessed:
35. Lam, C. M., Latif, U., Sack, A., Govindan, S., Sanderson, M., Vu, D. T., Smith, G., Sayed, D., & Khan, T. (2023). Advances in Spinal Cord Stimulation. *Bioengineering (Basel, Switzerland)*, 10(2), 185. <https://doi.org/10.3390/bioengineering10020185>



KAISER PERMANENTE[®]

Mid-Atlantic States

Spinal Cord Stimulation for Pain Management

Medical Coverage Policy

36. Abraham, M. E., Gold, J., Dondapati, A., Sheaffer, K., Gendreau, J. L., & Mammis, A. (2021). High Frequency 10 kHz Spinal Cord Stimulation as a First Line Programming Option for Patients With Chronic Pain: A Retrospective Study and Review of the Current Evidence. *Cureus*, 13(8), e17220. <https://doi.org/10.7759/cureus.17220>
37. Provenzano, D. A., Park, N., Edgar, D., Bovinet, C., & Tate, J. (2023). High-frequency (10 kHz) spinal cord stimulation (SCS) as a salvage therapy for failed traditional SCS: A narrative review of the available evidence. *Pain practice: the official journal of World Institute of Pain*, 23(3), 301–312. <https://doi.org/10.1111/papr.13184>
38. Sayed, D., Foster, J., Nairizi, A., Sills, S., & Miller, A. (2020). 10 kHz High-Frequency Spinal Cord Stimulation for Chronic Thoracic Pain: A Multicenter Case Series and a Guide for Optimal Anatomic Lead Placement. *Pain physician*, 23(4), E369–E376.

Approval History

Date approved by RUMC*	Date filed with the State of Maryland	Date of Implementation (Ten days after filing)
10/30/2012	11/01/2012	11/12/2012
10/24/2013	11/01/2013	11/11/2013
11/12/2014	11/12/2014	11/24/2014
10/21/2015	10/22/2015	11/02/2015

Approval History

Effective June 01, 2016, state filing is no longer required per Maryland House Bill [HB 798](#) – Health Insurance – Reporting

Date approved by RUMC*	Date of Implementation
10/21/2016	10/21/2016
10/25/2017	10/25/2017
10/15/2018	10/15/2018
10/29/2019	10/29/2019
10/15/2020	10/15/2020
10/19/2021	10/19/2021
10/20/2022	10/20/2022
09/27/2023	09/27/2023
09/26/2024	09/26/2024

*The Regional Utilization Management Committee received delegated authority in 2011 to review and approve designated



KAISER PERMANENTE®

Mid-Atlantic States

Spinal Cord Stimulation for Pain Management

Medical Coverage Policy

Utilization Management and Medical Coverage Policies by the Regional Quality Improvement Committee.

Note: Kaiser Permanente Mid-Atlantic States (KPMAS) include referral and authorization criteria to support primary care and specialty care practitioners, as appropriate, in caring for members with selected conditions. Whenever possible, Medical Coverage Policies are evidence-based and may also include expert opinion. Medical Coverage Policies are not intended or designed as a substitute for the reasonable exercise of independent clinical judgment by a practitioner in any particular set of circumstances for an individual member.

©2024, Kaiser Foundation Health Plan of the Mid-Atlantic States, Inc.

©2024, Mid-Atlantic Permanente Medical Group, P.C