



An Independent Licensee of the Blue Cross Blue Shield Association

EVIDENCE-BASED CRITERIA
SECTION: MEDICINE

ORIGINAL EFFECTIVE DATE: 09/19/22
LAST REVIEW DATE: 08/06/24
CURRENT EFFECTIVE DATE: 08/06/24
LAST CRITERIA REVISION DATE: 08/01/23
ARCHIVE DATE:

NEXT ANNUAL REVIEW DATE: 3RD QTR 2025

PARASPINAL SURFACE ELECTROMYOGRAPHY TO EVALUATE AND MONITOR BACK PAIN

Non-Discrimination Statement and Multi-Language Interpreter Services information are located at the end of this document.

Coverage for services, procedures, medical devices and drugs are dependent upon benefit eligibility as outlined in the member's specific benefit plan. This Evidence-Based Criteria must be read in its entirety to determine coverage eligibility, if any.

This Evidence-Based Criteria provides information related to coverage determinations only and does not imply that a service or treatment is clinically appropriate or inappropriate. The provider and the member are responsible for all decisions regarding the appropriateness of care. Providers should provide BCBSAZ complete medical rationale when requesting any exceptions to these guidelines.

The section identified as "Description" defines or describes a service, procedure, medical device or drug and is in no way intended as a statement of medical necessity and/or coverage.

The section identified as "Criteria" defines criteria to determine whether a service, procedure, medical device or drug is considered medically necessary or experimental or investigational.

State or federal mandates, e.g., FEP program, may dictate that any drug, device or biological product approved by the U.S. Food and Drug Administration (FDA) may not be considered experimental or investigational and thus the drug, device or biological product may be assessed only on the basis of medical necessity.

Evidence-Based Criteria are subject to change as new information becomes available.

For purposes of this Evidence-Based Criteria, the terms "experimental" and "investigational" are considered to be interchangeable.

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Description:

Paraspinal surface electromyography (SEMG) is a noninvasive procedure that records the summation of muscle electrical activity that has been investigated as a technique to evaluate the physiologic functioning of the back muscles. Additionally, this procedure has been explored to evaluate abnormal patterns of electrical activity in the paraspinal muscles in individuals with back pain symptoms such as spasm, tenderness, limited range of motion, or postural disorders.

The technique is performed using a single or an array of electrodes placed on the skin surface, with recordings made at rest, in various positions, or after a series of exercises. Recordings can also be made by using a handheld device, which is applied to the skin at different sites. Electrical activity is assessed by computer analysis of the frequency spectrum (i.e., spectral analysis), amplitude, or root mean square of the electrical action potentials.

SEMG devices approved by the U.S. Food and Drug Administration (FDA) include those that use a single electrode or a fixed array of multiple surface electrodes.

These include, *but not limited to*:

- CMAP Pro
- Insight Discovery
- Model 9200 EMG System

Criteria:

- Paraspinal surface electromyography (SEMG) for the diagnosis or monitoring of back pain is considered **experimental or investigational** when any **ONE** or more of the following criteria are met:
1. Lack of final approval from the appropriate governmental regulatory bodies (e.g., Food and Drug Administration); or
 2. Insufficient scientific evidence to permit conclusions concerning the effect on health outcomes; or
 3. Insufficient evidence to support improvement of the net health outcome; or
 4. Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives, or
 5. Insufficient evidence to support improvement outside the investigational setting

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Resources:

Literature reviewed 08/06/24. We do not include marketing materials, poster boards and non-published literature in our review.

1. Bittman B, Cram JR. Surface electromyography: an electrophysiological alternative in pain management. presented at: American Pain Society; October 22-25, 1992; San Diego, CA.
2. Cram JR, Lloyd J, Cahn TS. The reliability of EMG muscle scanning. *Int J Psychosom.* 1994;41(1-4):41-5.
3. De Luca CJ. Use of the surface EMG signal for performance evaluation of back muscles. *Muscle Nerve.* Feb 1993;16(2):210-6. doi:10.1002/mus.880160216
4. du Rose A, Breen A. Relationships between Paraspinal Muscle Activity and Lumbar Inter-Vertebral Range of Motion. *Healthcare (Basel).* Jan 5 2016;4(1)doi:10.3390/healthcare4010004
5. Ellestad SM, Nagle RV, Boesler DR, Kilmore MA. Electromyographic and skin resistance responses to osteopathic manipulative treatment for low-back pain. *J Am Osteopath Assoc.* Aug 1988;88(8):991-7.
6. Hanada EY, Johnson M, Hubley-Kozey C. A comparison of trunk muscle activation amplitudes during gait in older adults with and without chronic low back pain. *PM R.* Oct 2011;3(10):920-8. doi:10.1016/j.pmrj.2011.06.002
7. Hegmann KT, Travis R, Belcourt RM, et al. Diagnostic Tests for Low Back Disorders. *J Occup Environ Med.* Apr 2019;61(4):e155-e168. doi:10.1097/JOM.0000000000001551
8. Hu Y, Kwok JW, Tse JY, Luk KD. Time-varying surface electromyography topography as a prognostic tool for chronic low back pain rehabilitation. *Spine J.* Jun 1 2014;14(6):1049-56. doi:10.1016/j.spinee.2013.11.060
9. Hu Y, Siu SH, Mak JN, Luk KD. Lumbar muscle electromyographic dynamic topography during flexion-extension. *J Electromyogr Kinesiol.* Apr 2010;20(2):246-55. doi:10.1016/j.jelekin.2009.05.002
10. Humphrey AR, Nargol AV, Jones AP, Ratcliffe AA, Greenough CG. The value of electromyography of the lumbar paraspinal muscles in discriminating between chronic-low-back-pain sufferers and normal subjects. *Eur Spine J.* Mar 2005;14(2):175-84. doi:10.1007/s00586-004-0792-3
11. Hung CC, Shen TW, Liang CC, Wu WT. Using surface electromyography (SEMG) to classify low back pain based on lifting capacity evaluation with principal component analysis neural network method. *Annu Int Conf IEEE Eng Med Biol Soc.* 2014;2014:18-21. doi:10.1109/EMBC.2014.6943518

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12. Jones SL, Hitt JR, DeSarno MJ, Henry SM. Individuals with non-specific low back pain in an active episode demonstrate temporally altered torque responses and direction-specific enhanced muscle activity following unexpected balance perturbations. *Exp Brain Res*. Sep 2012;221(4):413-26. doi:10.1007/s00221-012-3183-8
13. Kienbacher T, Fehrmann E, Habenicht R, et al. Age and gender related neuromuscular pattern during trunk flexion-extension in chronic low back pain patients. *J Neuroeng Rehabil*. Feb 19 2016;13:16. doi:10.1186/s12984-016-0121-1
14. Knezevic NN, Candido KD, Vlaeyen JWS, Van Zundert J, Cohen SP. Low back pain. *Lancet*. Jul 3 2021;398(10294):78-92. doi:10.1016/S0140-6736(21)00733-9
15. Kreiner DS, Matz P, Bono CM, et al. Guideline summary review: an evidence-based clinical guideline for the diagnosis and treatment of low back pain. *Spine J*. Jul 2020;20(7):998-1024. doi:10.1016/j.spinee.2020.04.006
16. Neblett R, Brede E, Mayer TG, Gatchel RJ. What is the best surface EMG measure of lumbar flexion-relaxation for distinguishing chronic low back pain patients from pain-free controls? *Clin J Pain*. Apr 2013;29(4):334-40. doi:10.1097/AJP.0b013e318267252d
17. Peach JP, McGill SM. Classification of low back pain with the use of spectral electromyogram parameters. *Spine (Phila Pa 1976)*. May 15 1998;23(10):1117-23. doi:10.1097/00007632-199805150-00009
18. Roy SH, Oddsson LI. Classification of paraspinal muscle impairments by surface electromyography. *Phys Ther*. Aug 1998;78(8):838-51. doi:10.1093/ptj/78.8.838
19. Schabrun SM, Elgueta-Cancino EL, Hodges PW. Smudging of the Motor Cortex Is Related to the Severity of Low Back Pain. *Spine (Phila Pa 1976)*. Aug 1 2017;42(15):1172-1178. doi:10.1097/BRS.0000000000000938
20. Sheeran L, Sparkes V, Caterson B, Busse-Morris M, van Deursen R. Spinal position sense and trunk muscle activity during sitting and standing in nonspecific chronic low back pain: classification analysis. *Spine (Phila Pa 1976)*. Apr 15 2012;37(8):E486-95. doi:10.1097/BRS.0b013e31823b00ce
21. Van Damme B, Stevens V, Perneel C, et al. A surface electromyography based objective method to identify patients with nonspecific chronic low back pain, presenting a flexion related movement control impairment. *J Electromyogr Kinesiol*. Dec 2014;24(6):954-64. doi:10.1016/j.jelekin.2014.09.007



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Coding:

CPT: 95999, 96002, 97799, 99199
HCPCS: S3900

History:

Date:

Activity:

Medical Policy Panel	08/06/24	Review with revisions
Medical Directory (Dr. Raja)	07/25/24	Review with no revisions
Medical Policy Panel	08/01/23	Review with revisions
Medical Policy Panel	08/16/22	Approved guideline (Effective 9/19/22)

Policy Revisions:

08/06/24	Updated:	Description section
08/01/23	Added:	“Insufficient evidence to support improvement of the net health outcome; or”, and “Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives, or” to experimental or investigational criteria.



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Non-Discrimination Statement:

Blue Cross Blue Shield of Arizona (BCBSAZ) complies with applicable Federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability or sex. BCBSAZ provides appropriate free aids and services, such as qualified interpreters and written information in other formats, to people with disabilities to communicate effectively with us. BCBSAZ also provides free language services to people whose primary language is not English, such as qualified interpreters and information written in other languages. If you need these services, call (602) 864-4884 for Spanish and (877) 475-4799 for all other languages and other aids and services.

If you believe that BCBSAZ has failed to provide these services or discriminated in another way on the basis of race, color, national origin, age, disability or sex, you can file a grievance with: BCBSAZ's Civil Rights Coordinator, Attn: Civil Rights Coordinator, Blue Cross Blue Shield of Arizona, P.O. Box 13466, Phoenix, AZ 85002-3466, (602) 864-2288, TTY/TDD (602) 864-4823, crc@azblue.com. You can file a grievance in person or by mail or email. If you need help filing a grievance BCBSAZ's Civil Rights Coordinator is available to help you. You can also file a civil rights complaint with the U.S. Department of Health and Human Services, Office for Civil Rights electronically through the Office for Civil Rights Complaint Portal, available at <https://ocrportal.hhs.gov/ocr/portal/lobby.jsf>, or by mail or phone at: U.S. Department of Health and Human Services, 200 Independence Avenue SW., Room 509F, HHH Building, Washington, DC 20201, 1-800-368-1019, 800-537-7697 (TDD). Complaint forms are available at <http://www.hhs.gov/ocr/office/file/index.html>

Multi-Language Interpreter Services:

Spanish: Si usted, o alguien a quien usted está ayudando, tiene preguntas acerca de Blue Cross Blue Shield of Arizona, tiene derecho a obtener ayuda e información en su idioma sin costo alguno. Para hablar con un intérprete, llame al 602-864-4884.

Navajo: Díí kwe'é atah nilínigíí Blue Cross Blue Shield of Arizona haada yit'éego bina'idííkidgo éí doodago Háida bíjá anilyeedígíí t'áadoo le'é yína'idííkidgo beehaz'áanii hólo díí t'áa hazaadk'ehjí háká a'doowolgo bee haz'á doo baqah ilínigóó. Ata' halne'ígíí kojí' bich'í' hodíilnih 877-475-4799.

Chinese: 如果您，或是您正在協助的對象，有關於插入項目的名稱 Blue Cross Blue Shield of Arizona 方面的問題，您有權利免費以您的母語得到幫助和訊息。洽詢一位翻譯員，請撥電話 在此插入數字 877-475-4799。

Vietnamese: Nếu quý vị, hay người mà quý vị đang giúp đỡ, có câu hỏi về Blue Cross Blue Shield of Arizona quý vị sẽ có quyền được giúp và có thêm thông tin bằng ngôn ngữ của mình miễn phí. Để nói chuyện với một thông dịch viên, xin gọi 877-475-4799.

Arabic:

إن كان لديك أو لدى شخص تساعد أسئلة بخصوص Blue Cross Blue Shield of Arizona، فلديك الحق في الحصول على المساعدة والمعلومات الضرورية بلغتك من دون أية تكلفة. للتحدث مع مترجم اتصل بـ 877-475-4799.

