

Corporate Medical Policy

Paraspinal Surface Electromyography (SEMG)

File Name: paraspinal_surface_electromyography_(emg)
Origination: 4/2005
Last Review: 5/2024

Description of Procedure or Service

Surface electromyography (SEMG), a noninvasive procedure that records the summation of muscle electrical activity, has been investigated as a technique to evaluate the physiologic functioning of the back. In addition, this procedure has been studied as a technique 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 (ROM), or postural disorders.

Identifying the pathogenesis of back pain is a challenging task, in part due to the complex anatomy of the back, which includes vertebrae, intervertebral discs, facet joints, spinal nerve roots, and numerous muscles. For example, back pain may be related to osteoarthritis, disc disease, spondylosis, or muscular pathology, such as muscle strain or spasm. Moreover, due to referred pain patterns, the location of the pain may not be anatomically related to the pathogenesis of the pain. For example, buttock or leg pain may be related to pathology in the spine. In addition to the diagnostic challenges of back pain is the natural history of acute back pain. The majority of cases of acute low back pain will resolve with conservative therapy, such as physical therapy, and continuing normal activities within limits permitted by the pain. Thus, initial imaging or other diagnostic testing is generally not recommended unless “red flag” warning signs are present, or the pain persists for longer than four to six weeks. Red flag findings include significant trauma, history of cancer, unremitting night pain, fevers or chills, and progressive motor or sensory deficits.

Aside from the physical exam, diagnostic tests include imaging technologies, such as magnetic resonance imaging (MRI), designed to identify pathology (e.g., bulging discs), or tests such as discography to localize the abnormality by reproducing the pain syndrome. However, due to their lack of specificity, all diagnostic tests must be carefully interpreted in the context of the clinical picture. For example, 5% of asymptomatic individuals will have bulging discs as identified by MRI. Therefore, the presence of a bulging disc may only be clinically significant if well correlated with symptoms. Assessment of the musculature may focus on range of motion or strength exercises.

In contrast to anatomic imaging, surface electromyography (SEMG), which records the summation of muscle activity from groups of muscles, has been investigated as a technique to evaluate the physiological functioning of the back. SEMG, a noninvasive procedure, is contrasted with needle electromyography, an invasive procedure, in which the electrical activity of individual muscles is recorded. Paraspinal SEMG, also referred to as paraspinal EMG scanning, has been explored as a technique 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 can be assessed by computer analysis of the frequency spectrum (i.e., spectral analysis), amplitude, or root mean square of the electrical

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action potentials. In particular, spectral analysis focusing on the median frequency has been used to assess paraspinal muscle fatigue during isometric endurance exercises. Paraspinal SEMG has been researched as a technique to establish the etiology of back pain and also has been used to monitor the response to therapy and establish physical activity limits, such as assessing capacity to lift heavy objects or ability to return to work.

Paraspinal SEMG is an office-based procedure that may be most commonly used by physiatrists or chiropractors. The following clinical applications of the paraspinal SEMG have been proposed:

- clarification of a diagnosis (i.e., muscle, joint, or disc disease)
- selection of a course of medical therapy
- selection of a type of physical therapy
- preoperative evaluation
- postoperative rehabilitation
- follow-up of acute low back pain
- evaluation of exacerbation of chronic low back pain
- evaluation of pain management treatment techniques

Regulatory Status

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. Examples include the CMAP Pro (Medical Technologies) and Model 9200 EMG System (Myotronics-Noromed).

Several FDA-approved devices combine surface EMG along the spine with other types of monitors. For example, in 2007, the Insight Discovery (Fasstech; Burlington, MA) was cleared for marketing through the 510(k) process. The device contains six sensor types, one of which is surface EMG. The indications include measuring bilateral differences in surface EMG along the spine and measuring surface EMG along the spine during functional tasks. (Earlier Insight models had fewer sensor types).

******Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.***

Policy

Paraspinal Surface Electromyography (SEMG) is considered investigational for all applications. BCBSNC does not provide coverage for investigational services or procedures.

Benefits Application

This medical policy relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

When Paraspinal Surface Electromyography (SEMG) is covered

Not applicable.

When Paraspinal Surface Electromyography (SEMG) is not covered

Paraspinal Surface Electromyography (SEMG) is considered investigational for all applications, including, but not limited to diagnosis or monitoring of back pain.

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Policy Guidelines

For individuals who have back pain who receive paraspinal SEMG for evaluation and monitoring, the evidence includes several nonrandomized studies on using findings to classify back pain. Relevant outcomes are test accuracy and validity, symptoms, functional outcomes, quality of life, and resource utilization. There have been no studies directly comparing SEMG with other noninvasive techniques for evaluating back pain, and standard criteria for normal and abnormal SEMG measurements have not been determined. SEMG has been proposed as a noninvasive technique providing objective measurements that would inform treatment decisions in patients with back pain. While the studies have shown that SEMG results have detected different pathologies in patients with back pain, none of the studies reported health outcomes. There are no data on the impact of SEMG for managing back pain. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

Billing/Coding/Physician Documentation Information

This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

Applicable codes: S3900

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Scientific Background and Reference Sources

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 1/5/2005

Specialty Matched Consultant Advisory Panel - 6/2005

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 3/7/2006

Specialty Matched Consultant Advisory Panel - 5/2007

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 2/14/08

Specialty Matched Consultant Advisory Panel - 5/2009

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 11/11/10

Specialty Matched Consultant Advisory Panel - 5/2011

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 11/11/2011

Specialty Matched Consultant Advisory Panel – 5/2012

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 11/8/2012

Specialty Matched Consultant Advisory Panel – 5/2013

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BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 9/13/2013

Specialty Matched Consultant Advisory Panel – 5/2014

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 9/11/2014

Specialty Matched Consultant Advisory Panel – 5/2015

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 9/10/2015

Specialty Matched Consultant Advisory Panel – 5/2016

Specialty Matched Consultant Advisory Panel – 5/2017

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 6/8/2017

Specialty Matched Consultant Advisory Panel – 5/2018

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 6/14/2018

Specialty Matched Consultant Advisory Panel – 5/2019

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 6/13/2019

Specialty Matched Consultant Advisory Panel – 5/2020

BCBSA Medical Policy Reference Manual [Electronic Version]. 2.01.35, 10/15/2020

Specialty Matched Consultant Advisory Panel – 5/2021

Specialty Matched Consultant Advisory Panel – 5/2022

Specialty Matched Consultant Advisory Panel – 5/2023

Knezevic NN, Candido KD, Vlaeyen JWS, et al. Low back pain. Lancet. Jul 03 2021; 398(10294): 78-92. PMID 34115979

Hegmann KT, Travis R, Belcourt RM, et al. Diagnostic Tests for Low Back Disorders. J Occup EnvironMed. Apr 2019; 61(4): e155-e168. PMID 30694882

Specialty Matched Consultant Advisory Panel – 5/2024

Medical Director Review- 5/2024

Policy Implementation/Update Information

4/21/05	New policy written. Paraspinal Surface Electromyography (EMG) is not covered. It is considered investigational. Notification given 4/21/05. Effective date of policy 7/7/05.
7/7/05	Specialty Matched Consultant Advisory Panel review 6/24/2005. No change to policy. Reference added.
6/18/07	Specialty Matched Consultant Advisory Panel review 5/23/2007. No change to policy statement. Reference added.

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- 7/6/09 Specialty Matched Consultant Advisory Panel review 5/28/2009. "Description" section revised. No change to policy statement. Reference added. (btw)
- 6/22/10 Policy Number(s) removed (amw)
- 6/21/11 Specialty Matched Consultant Advisory Panel review 5/25/2011. "Description" section revised. "Policy Guidelines" updated. No change to policy intent. References added. (btw)
- 2/7/12 Reference added. (btw)
- 5/29/12 Specialty Matched Consultant Advisory Panel review 5/16/2012. Reformatted the When Not Covered statement for consistency reasons. No change to policy intent. (btw)
- 7/24/12 Policy statement changed from "Paraspinal surface electromyography (SEMG) is considered investigational for all applications." To "Paraspinal surface electromyography (SEMG is considered investigational as a technique to diagnose or monitor back pain." Medical Director review 7/12/2012. (btw)
- 1/15/13 Reference added. (btw)
- 4/30/13 Corporate Medical Policy converted to Evidence Based Guideline. "Paraspinal surface electromyography (SEMG) is not recommended as a technique to diagnose or monitor back pain." (btw)
- 10/29/13 Reference added. (btw)
- 10/14/14 Specialty Matched Consultant Advisory Panel review 5/27/2014. No change to guideline. (btw)
- 11/11/14 Reference added. (sk)
- 7/28/15 Evidence based guideline converted to corporate medical policy. Medical Director review. Specialty Matched Consultant Advisory Panel review 5/27/2015. Notification given 7/28/15 for policy effective date 10/01/15. (sk)
- 10/30/15 Reference added. (sk)
- 7/1/16 Specialty Matched Consultant Advisory Panel review 5/25/2016. (sk)
- 6/30/17 Specialty Matched Consultant Advisory Panel review 5/31/2017. (sk)
- 7/28/17 Reference added. Policy Guidelines updated. (sk)
- 6/29/18 Specialty Matched Consultant Advisory Panel review 5/23/2018. (sk)
- 8/24/18 Reference added. (sk)
- 5/28/19 Specialty Matched Consultant Advisory Panel review 5/15/2019. (sk)
- 8/27/19 Reference added. (sk)
- 6/23/20 Specialty Matched Consultant Advisory Panel review 5/20/2020. (bb)

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- 6/15/21 Reference added. Specialty Matched Consultant Advisory Panel review 5/19/2021. (sk)
- 6/14/22 Specialty Matched Consultant Advisory Panel review 5/18/2022. (sk)
- 6/30/23 Specialty Matched Consultant Advisory Panel review 5/17/2023. (sk)
- 5/29/24 References updated. Medical Director review 5/2024. Specialty Matched Consultant Advisory Panel review 5/2024. (ldh)

Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.