

**Medical Coverage Policy | Paraspinal Surface Electromyography (SEMG), to Evaluate and Monitor Back Pain**



**EFFECTIVE DATE:** 10|01|2010  
**POLICY LAST UPDATED:** 10|11|2016

## OVERVIEW

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 patients with back pain symptoms, such as spasm, tenderness, limited range of motion, or postural disorders.

## MEDICAL CRITERIA

### BlueCHiP for Medicare and Commercial Products

None

## PRIOR AUTHORIZATION

Not Applicable

## POLICY STATEMENT

### BlueCHiP for Medicare and Commercial Products

Paraspinal surface electromyography to evaluate and monitor back pain is considered **not medically necessary** because there is insufficient evidence in the published medical literature to demonstrate its safety and efficacy in the treatment of back pain.

## COVERAGE

### BlueCHiP for Medicare and Commercial Products

Benefits vary between groups/contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage or Subscriber Agreement applicable surgery services and services not medically necessary coverage.

## BACKGROUND

Back pain is an extremely common condition, affecting most individuals at some point in their lives. 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. Most 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 4 to 6 weeks. Red flag findings include significant trauma, history of cancer, unremitting night pain, fevers or chills, and progressive motor or sensory deficits.

Aside from physical examination, diagnostic tests include imaging technologies, such as magnetic resonance imaging (MRI), designed to identify pathology (eg, 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 patients

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, SEMG, which records the summation of muscle activity from groups of muscles, has been investigated as a technique to evaluate the physiologic functioning of the back. A noninvasive procedure, SEMG is contrasted with needle electromyography, an invasive procedure in which the electrical activity of individual muscles is recorded. Paraspinal SEMG has been explored as a technique to evaluate abnormal patterns of electrical activity in the paraspinal muscles in patients with back pain symptoms such as spasm, tenderness, limited range of motion, or postural disorders. The technique is performed using 1 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 (ie, spectral analysis), amplitude, or root mean square of the electrical action potentials. In particular, spectral analysis that focuses 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 (ie, 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

There is inadequate data on the technical and diagnostic performance of paraspinal surface electromyography (SEMG) compared with a criterion standard reference test. Moreover, there is insufficient evidence regarding how findings from paraspinal SEMG impact patient management and/or how use of the test improves health outcomes. Thus, paraspinal surface electromyography for diagnosing and monitoring back pain is considered not medically necessary.

## **CODING**

### **BlueCHiP for Medicare and Commercial Products:**

The following HCPCS code is specific to a surface EMG and is not medically necessary  
S3900: Surface electromyography (EMG).

## **RELATED POLICIES**

None

## **PUBLISHED**

Provider Update, January 2017  
Provider Update, October 2015  
Provider Update, August 2015  
Provider Update, September 2013  
Provider Update, June 2012  
Provider Update, July 2011  
Provider Update, June 2010

## REFERENCES:

1. American Association of Electrodiagnostic Medicine. Referenced on 4/5/10: [http://www.aanem.org/PracticeIssues/TechnologyReviews/use\\_surface\\_emg.cfm](http://www.aanem.org/PracticeIssues/TechnologyReviews/use_surface_emg.cfm).
2. Greenough CG, Oliver CW, Jones AP. Assessment of Spinal Musculature Using Surface Electromyographic Spectral Color Mapping. *Spine*;15 August 1998;23(16):1768-1774.
3. Merletti R, Rainoldi A, Farina D. Surface Electromyography for Noninvasive Characterization of Muscle. *American College of Sports Medicine*; January 2001;29(1):20-25. American Cancer Society (ACS). 2013 Ovarian Cancer Key Statistics. Available at URL address:<http://www.cancer.org/cancer/ovariancancer/detailedguide/ovarian-cancer-key-statistics>
4. American College of Occupational and Environmental Medicine (ACOEM). Low back disorders. Occupational medicine practice guidelines: evaluation and management of common health problems and functional recovery in workers. [www.guideline.gov](http://www.guideline.gov). Accessed June, 2014.
5. Hu Y, Siu SH, Mak JN, et al. Lumbar muscle electromyographic dynamic topography during flexion-extension. *J Electromyogr Kinesiol*. 2010;20(2):246-255. PMID
6. Hu Y, Kwok JW, Tse JY, et al. Time-varying surface electromyography topography as a prognostic tool for chronic low back pain rehabilitation. *Spine J*. Jun 1 2014;14(6):1049-1056. PMID 24530438 1
7. Jones SL, Hitt JR, Desarno MJ, et al. 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):413-426. PMID 22875027
8. Sheeran L, Sparkes V, Caterson B, et al. 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):E486-495. PMID 22024899
9. Neblett R, Brede E, Mayer TG, et al. 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):334-340. PMID 23328325

CLICK THE ENVELOPE ICON BELOW TO SUBMIT COMMENTS

