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

EFFECTIVE DATE: 10|01|2016
POLICY LAST REVIEWED: 05|20|2026

OVERVIEW
A noninvasive procedure that records the summation of muscle electrical activity, paraspinal surface electromyography (SEMG) has been investigated as a technique to evaluate the physiologic functioning of the back. Additionally, 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
Not Applicable

PRIOR AUTHORIZATION
Not Applicable

POLICY STATEMENT
Medicare Advantage Plans
Paraspinal surface electromyography to evaluate and monitor back pain is considered not covered as the evidence is insufficient to determine that the effects of the technology result in an improvement in the net health outcomes.

Commercial Products
Paraspinal surface electromyography to evaluate and monitor back pain is considered not medically necessary as the evidence is insufficient to determine that the effects of the technology results in an improvement in the net health outcomes.

COVERAGE
Medicare Advantage Plans and Commercial Products
Benefits vary between groups and contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage or Subscriber Agreement for applicable not medically necessary/not covered benefits/coverage.

BACKGROUND
Back pain is a common condition that affects most individuals at some point in their lives. Identifying the pathogenesis of back pain is challenging, in part due to the complex anatomy of the back, which includes vertebrae, intervertebral discs, facet joints, spinal nerve roots, and numerous muscles. Back pain may be related to osteoarthritis, disc disease, subluxation, or muscular pathologies, 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.

Aside from physical examination, diagnostic testing includes imaging technologies, such as magnetic resonance imaging, designed to identify pathology (e.g., bulging discs), or tests such as discography to localize the abnormality by reproducing the pain syndrome. However, these tests lack specificity and must be carefully interpreted in the context of the clinical picture. For example, magnetic resonance imaging identifies 5% of asymptomatic patients as having bulging discs. However, the presence of a bulging disc may only be clinically significant if correlated with other symptoms. Assessment of the musculature may focus on a 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 physiologic functioning of the back. A noninvasive procedure, SEMG differs from needle electromyography, an invasive procedure in which the electrical activity of individual muscles is recorded. Paraspinal SEMG has been explored 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 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 (ie, spectral analysis), amplitude, or root mean square of the electrical action potentials. In particular, a 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 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. The following clinical applications of the paraspinal SEMG have been proposed:
• clarification of 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 (LBP)
• evaluation of exacerbation of chronic LBP
• evaluation of pain management treatment techniques.

Most cases of acute LBP with conservative therapy (e.g., physical therapy) while continuing normal activities within limits permitted by the pain. Therefore, initial imaging or other diagnostic testing is generally not recommended unless "red flag" warning signs are present, or the pain persists for more than 4 to 6 weeks. Red flag findings include significant trauma, history of cancer, unrelenting night pain, fevers or chills, and progressive motor or sensory deficits.

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. Surface electromyography has been proposed as a noninvasive technique providing objective measurements that would inform treatment decisions in patients with back pain. While studies have shown that SEMG results have detected different pathologies in patients with back pain, none of the studies reported health outcomes. There are also 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.

CODING

Medicare Advantage Plans
The following HCPCS code is specific to a surface EMG and is not covered.
S3900: Surface electromyography (EMG).

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, July 2026
Provider Update, December 2025
Provider Update, September 2024
Provider Update, September 2023
Provider Update, October 2022

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