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Surface Electrical Stimulation

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Related Policies (if applicable)
None

Disclaimer

Carefully check state regulations and/or the member contract.
Each benefit plan, summary plan description or contract defines which services are covered, which services are excluded, and which services are subject to dollar caps or other limitations, conditions or exclusions. Members and their providers have the responsibility for consulting the member's benefit plan, summary plan description or contract to determine if there are any exclusions or other benefit limitations applicable to this service or supply. **If there is a discrepancy between a Medical Policy and a member's benefit plan, summary plan description or contract, the benefit plan, summary plan description or contract will govern.**

Coverage

Surface electrical stimulation **is considered experimental, investigational and/or unproven** for any indication* including, but not limited to, **ANY** of the following:

- H-Wave electrical stimulation for all indications including, but not limited to:
  - Treatment of pain, or
  - Wound healing, or
- Threshold electrical stimulation for all indications including, but not limited to:
  - Treatment of motor disorders, or
  - Treatment of cerebral palsy; or
- Microcurrent stimulation; or
- Galvanic stimulation; or

- Electroceutical therapy, which is identified by other names including, but not limited to, non-invasive neuron blockade, electroceutical neuron blockade, bioelectric nerve block, bioelectric treatment systems; or
- Treatment of dysphagia (e.g., VitalStim™); or
- Treatment of scoliosis (e.g., ScoliTron™); or
- To increase circulation (e.g., geko device).

***NOTE:** This policy does not apply to the following electrical stimulation modalities:
- Cranial electrotherapy stimulation and auricular electrostimulation;
- Transcutaneous electrical stimulation and transcutaneous electrical modulation pain reprocessing;
- Interferential current stimulation;
- Electrical and electromagnetic stimulation for the treatment of arthritis;
- Functional neuromuscular electrical stimulation.

Policy Guidelines

None.

Description

Surface electrical stimulation uses devices that transmit electrical impulses by way of electrodes placed on the skin. Although the various types of stimulation may differ in waveform or method of delivering current, electrical stimulation is postulated to generally have any of the following physiological effects:
- Re-education of muscle;
- Development and increase of muscle tone and strength;
- Maintenance or increase of range of motion;
- Improvement of local blood circulation;
- Prevention of muscle atrophy;
- Relaxation of muscular spasms;
- Create a state of generalized relaxation for relief of anxiety, depression, and/or insomnia.

The following are descriptions and uses of some different types of surface electrical stimulation.

H-Wave Electrical Stimulation
H-wave stimulation is a distinct form of electrical stimulation, and an H-wave device is U.S. Food and Drug Administration-approved for medical purposes that involve repeated muscle contractions. H-wave electrical stimulation has been evaluated primarily as a pain treatment, but it has also been studied for other indications such as wound healing and

improving post-surgical range of motion. Both office-based and home models of the H-wave device are available.

H-wave stimulation differs from other forms of electrical stimulation, such as transcutaneous electrical nerve stimulation, in terms of its wave form. While H-wave stimulation may be performed by physicians, physiatrists, chiropractors, or podiatrists, H-wave devices are also available for home use. H-wave stimulation has been used for the treatment of pain related to a variety of etiologies, such as diabetic neuropathy, muscle sprains, temporomandibular joint dysfunctions, or reflex sympathetic dystrophy. H-wave stimulation has also been used to accelerate healing of wounds such as diabetic ulcers and to improve range of motion and function after orthopedic surgery. H-wave electrical stimulation must be distinguished from the H-waves that are a component of electromyography.

The H-Wave® muscle stimulator (Electronic Waveform Lab, Huntington Beach, CA) was cleared for marketing by the FDA through the 510(k) process. The FDA classified H-wave stimulation devices as "powered muscle stimulators." (1) The FDA states this device creates therapeutic muscle contractions at frequencies of 1-70 Hz and provides: "1) relaxation of muscle spasms; 2) prevention or retardation of disuse atrophy; 3) increasing local blood circulation; 4) muscle re-education; 5) immediate post-surgical stimulation of calf muscles to prevent venous thrombosis; and 6) maintaining or increasing range of motion." (2) Uses of the device not cleared by the FDA include, but are not limited to, treatment of diabetic neuropathy and wound healing. FDA product code IPF

Threshold Electrical Stimulation

Threshold electrical stimulation is provided by a small electrical generator, lead wires, and surface electrodes that are placed over the targeted muscles. The intensity of the stimulation is set at the sensory threshold and does not cause a muscle contraction.

Threshold electrical stimulation is described as the delivery of low-intensity electrical stimulation to target spastic muscles during sleep at home. The stimulation is not intended to cause muscle contraction. Although the mechanism of action is not understood, it is thought that low-intensity stimulation may increase muscle strength and joint mobility, leading to improved voluntary motor function. The technique has been used most extensively in children with spastic diplegia related to cerebral palsy but also in those with other motor disorders, such as spina bifida.

Devices used for threshold electrical stimulation are classified as "powered muscle stimulators." As a class, these devices are described by the FDA as "an electronically powered device intended for medical purposes that repeatedly contracts muscles by passing electrical currents through electrodes contacting the affected body area."

Microcurrent Stimulation
Microcurrent stimulation, also known as microcurrent electrical nerve stimulation (MENS), or low-voltage microampere stimulation, is similar to TENS, except that it uses current in the "microampere range," which is 1000 times less than that of TENS and below sensation threshold. While TENS is used for pain, the sub-sensory microcurrent stimulation acts on the body's naturally occurring electrical impulses to decrease pain and facilitate healing by increasing adenosine triphosphate (ATP) production in tissues. The device is primarily used to manage acute and chronic pain, reduce edema and inflammation, and to promote wound healing. (3) Examples of microcurrent stimulation include but are not limited to the following devices:

- Electro-Acuscope 80T (4);
- InspirStar IS02BA Microcurrent Stimulator™ (5);
- Micro II Microcurrent TENS (6);

Galvanic Stimulation
Galvanic stimulation, also known as high volt galvanic stimulation, is characterized by high voltage pulsed stimulation and is proposed primarily for local edema reduction through muscle pumping and polarity effect. Edema is comprised of negatively charged plasma proteins, which leak into the interstitial space. The theory of galvanic stimulation is that the high voltage stimulus applies an electrical potential which disperses the negatively charged proteins away from the edematous site, thereby reducing the edema. The high voltage and direct current used in high voltage galvanic stimulation differentiates from the low voltage and alternating current used in TENS or neuromuscular electrical nerve stimulators. High voltage galvanic stimulation is also proposed for wound healing by increasing circulation and numerous other conditions (7).

High voltage galvanic stimulators are FDA approved as a 510(k) Class II device. Examples of high voltage galvanic stimulators include, but are not limited to the following devices:

- CS3102 High Voltage Galvanic Stimulator (8);
- GS3000. (9)

Electroceutical Therapy
Electroceutical therapy, also known as non-invasive neuron-blockade, bioelectric treatment, or electroceutical neuron-blockade, is a non-invasive, electrical-based treatment that is used for acute and chronic pain, e.g., arthritis, blood flow disorders of the upper and lower extremities, nervous system disorders. Electroceutical devices are similar to TENS in that they deliver stimulation through electrodes, or suction cups, attached to the skin; but they differ in that they use an electrical frequency many times higher than TENS. (10) Bioelectric therapy decreases pain by blocking pain messages to the brain and it is believed to aide in the production of chemicals called endorphins which decrease and/or eliminates painful sensations by blocking the message of pain from being delivered to the brain. (11) An example of a device used for bioelectric therapy is the Matrix

PRO ElecDT (Matrix Electromedical, Inc., Las Vegas, NV) which was 510(k) approved by the FDA as an interferential current therapy device. (12)

Treatment of Dysphagia, i.e., VitalStim™

VitalStim™ is a non-invasive treatment for dysphasia (difficulty in swallowing) and is claimed to restore enough swallowing function to reduce or eliminate the need for tube feedings. With VitalStim™ therapy, electrical neuromuscular stimulation is delivered through electrodes attached to the skin of the throat, over the pharyngeal muscles; stimulation activates key swallowing muscles, which helps patients create or re-learn muscle function necessary for swallowing. (13, 14)

Electrical Stimulation as a Treatment of Scoliosis

Adult scoliosis is defined as an abnormal lateral curvature of the spine in which the coronal plane is >10° (measured by the Cobb angle) in a skeletally mature patient. Adolescent idiopathic scoliosis (AIS) is scoliosis with Cobb angle >10°, age of onset ≥10 years, with no underlying etiology (e.g., congenital, neuromuscular, syndromic). Curves with Cobb angle <10° are considered within normal limits of spinal asymmetry. Scoliosis is often accompanied by abnormal curvature in the sagittal plane (e.g., hyperkyphosis of the thoracic spine, loss of lumbar lordosis) and/or displacement of one or more vertebral bodies (spondylolisthesis). Treatment options typically include observation, bracing, surgical correction, and physical therapy. (15, 16, 17) Currently, there are various stimulators that can be used to treat scoliosis; ScoliTron™ is one example.

Neuromuscular Electrical Stimulation (NMES) to Increase Circulation

The geko™ devices with OnPulse™ technology are low-frequency neuromuscular electro-stimulation devices that stimulate the common peroneal nerve, activating the calf and foot muscle pumps, resulting in isometric muscle contraction and increased blood flow.
The geko™ device stimulates the common peroneal nerve activating the calf and foot muscle pumps, resulting in increased blood flow in the deep veins. The device is worn just below the knee on one or both legs and is available in two versions; geko™ T-3 and geko™ W-3. (18)

Regulatory Status

Many electrical stimulation devices have received marketing clearance through the United States (U.S.) Food and Drug Administration 510(k) process. Marketing clearance via the 510(k) process does not require data regarding clinical efficacy; these devices are considered substantially equivalent to predicate devices marketed in interstate commerce prior to May 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified and do not require approval of a premarket approval application. Refer to accessdata.fda.gov for a complete list of U.S. FDA approved devices.

Rationale

This medical policy is based on reviews of relevant specialty society guidelines and position statements.

Guidelines and Position Statements

American College of Occupational and Environmental Medicine

In 2024 the ACEOM offered the following guidance for individuals with chronic pain (19):

Electrical stimulation	**Recommendation**	**Evidence**
	Direct current stimulation for complex regional pain syndrome	No recommendation, insufficient evidence (I)
	Microcurrent cranial electrical stimulation for fibromyalgia	Not recommended, insufficient evidence (I)
	Microcurrent electrical stimulation for complex regional pain syndrome	Not recommended, insufficient evidence (I)
	Microcurrent stimulation for electrical stimulation for neuropathic pain	No recommendation, insufficient evidence (I)
	Sympathetic electrotherapy for complex regional pain syndrome	Not recommended, insufficient evidence (I)
	Sympathetic electrotherapy for neuropathic pain	Not recommended, insufficient evidence (I)
	Transcranial direct current stimulation for fibromyalgia	Recommended, evidence (C)
	Transcranial direct current stimulation for neuropathic pain	No recommendation, insufficient evidence (I)
	Transcranial magnetic stimulation for fibromyalgia	Not recommended, insufficient evidence (I)
Electrical Therapies	H-Wave Device Stimulation for neuropathic pain.	No recommendation, insufficient evidence (I)
	Other electrical therapies for fibromyalgia	Not recommended, insufficient evidence
Electro-magnetic intervention	Pulsed electromagnetic field therapy for complex regional pain syndrome	Not recommended, evidence(C)
	Pulsed electromagnetic field therapy for fibromyalgia	Not recommended, insufficient evidence (I)
Galvanic Therapy	High-voltage Galvanic Therapy for complex regional pain syndrome	Not recommended, insufficient evidence (I)
	High-voltage Galvanic Therapy for neuropathic pain	No recommendation, insufficient evidence (I)

ACEOM used recommendations under the following categories:

- Strongly recommended, “A” level;
- Moderately recommended, ”B” level;
- Recommended, “C” level;
- Insufficient – Recommended (consensus-based), “I” level;
- Insufficient – No recommendation (consensus based), “I“ level;
- Insufficient- Not recommended (consensus based), “I” level;
- Not recommended, “C” level;
- Moderately not recommended, “B” level;
- Strongly not recommended, “A” level.

Osteoarthritis Research Society International

The 2014 OARSI guidance for nonsurgical management of knee osteoarthritis states that electrotherapy/neuromuscular electrical stimulation is not appropriate as there are conflicting efficacy data and additional studies are needed to determine the efficacy of this intervention. (20) In 2019, OARSI updated their guideline, and they did not include electrical stimulation and/or electrotherapy as a treatment modality. (21)

American College of Physicians

The 2018 ACP guidelines (22) state: “Given that most patients with acute or subacute low back pain improve over time regardless of treatment, clinicians and patients should select nonpharmacologic treatment with superficial heat (moderate-quality evidence), massage, acupuncture, or spinal manipulation (low-quality evidence).

American Physical Therapy Association

The 2024 APTA guidelines on physical therapy management of congenital muscular torticollis stated that microcurrent may be considered as one of several possible supplemental interventions but should only be applied by clinicians skilled in that modality. Under action statement 14 they state: “Evaluate Evidence-Informed Supplemental Intervention(s) for Appropriateness to Augment the First-Choice Intervention. Studies are needed to describe and clarify the efficacy of all supplemental interventions, including determinants for their choice, principles of application, dosages, and outcome measures”. (23)

National Institute for Health, and Care Excellence

In a 2023 diabetic foot problems prevention and management clinical guideline under section 1.5.12, the NICE recommends to not offer electrical stimulation therapy to treat diabetic foot ulcers, unless as a part of a clinical trial. (24).

In 2014, NICE offered the following guidance regarding the geko™ device for reducing the risk of venous thromboembolism (25):

“6.1 The Committee was mindful of the circumstances of the patient population included in the evaluation, who are at high risk of venous thromboembolism and unable to receive

either any other mechanical or pharmacological method of prophylaxis. It iconsidered that it is plausible that the geko device would reduce the risk of venous thromboembolism in these patients, despite the lack of direct evidence from clinical studies. It also took account of the low risk of harm from the device. Taking these considerations into account, the Committee judged that the case for adoption of the geko device in this population of patients was supported."
"6.2 The Committee considered that further research on the geko device in clinical settings could focus on reducing the current uncertainties about the reduction in relative risk in the defined patient population and allow investigation into its use in broader patient populations."

The National Institute of Neurological Disorders and Stroke
The National Institute of Neurological Disorders and Stroke (26) acknowledges that many children and adolescents with cerebral palsy use some form of complementary or alternative medicine. Functional electrical stimulation to restore muscle movement and to target and strengthen spastic muscles is considered a new rehabilitative therapy. Although there are anecdotal reports of some benefit in some children with cerebral palsy, alternative therapies have not approved by the FDA for the treatment of cerebral palsy and are actively being researched.

Society for Vascular Surgery and the American Venous Forum
In a clinical practice guideline from the Society for Vascular Surgery and the American Venous Forum for the management of venous leg ulcers, electrical stimulation for venous leg ulcers is not recommended. This is due to few studies that focus solely on venous leg ulcers along with inconsistency in the treatment parameters including variability in type of electrical current, settings, treatment times, and preferred waveforms, making comparisons impossible (27).

Treatment for Dysphagia (i.e., VitalStim™)
American College of Chest Physicians (ACCP)
The 2006 ACCP guidelines (28) regarding cough and aspiration of food and liquids due to oral-pharyngeal dysphagia include a recommendation regarding electrical stimulation "for patients with muscular weakness during swallowing, muscle strength training, with or without electromyographic biofeedback, and electrical stimulation treatment of the swallowing musculature are promising techniques, but cannot be recommended at this time until further work in larger populations is performed" (Level of evidence: low; benefit: conflicting; grade of evidence 1).

American Speech-Language-Hearing Association (ASHA)
The ASHA's practice portal states that the benefits of electrical stimulation for swallowing remain "unclear." (29)

Treatment of Scoliosis (e.g., ScoliTron™)

National Scoliosis Foundation

The National Scoliosis Foundation stated, "After five years, 70% of those using electrical stimulation or being observed had progressed 6 degrees or more. We found there is no difference whatsoever between electrical stimulation and observation. Electrical stimulation is now discarded as a method of treatment." (30)

Coding

Procedure codes on Medical Policy documents are included **only** as a general reference tool for each policy. **They may not be all-inclusive.**

The presence or absence of procedure, service, supply, or device codes in a Medical Policy document has no relevance for determination of benefit coverage for members or reimbursement for providers. **Only the written coverage position in a Medical Policy should be used for such determinations.**

Benefit coverage determinations based on written Medical Policy coverage positions must include review of the member's benefit contract or Summary Plan Description (SPD) for defined coverage vs. non-coverage, benefit exclusions, and benefit limitations such as dollar or duration caps.

CPT Codes	97014, 97032
HCPCS Codes	A4560, E0744, E0745, E1399, G0283

*Current Procedural Terminology (CPT®) ©2025 American Medical Association: Chicago, IL.

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Centers for Medicare and Medicaid Services

The information contained in this section is for informational purposes only. HCSC makes no representation as to the accuracy of this information. It is not to be used for claims adjudication for HCSC Plans.

The Centers for Medicare and Medicaid Services does not have a national Medicare coverage position. Coverage may be subject to local carrier discretion.

A national coverage position for Medicare may have been changed since this medical policy document was written. See Medicare's National Coverage at cms.hhs.gov.

Policy History/Revision	
Date	**Description of Change**
5/7/2026	New medical document. Surface electrical stimulation is considered experimental, investigational and/or unproven for any indication.