

## Corporate Medical Policy

### Neurostimulation, Electrical

**File Name:** Neurostimulation\_electrical  
**Origination:** 4/2004  
**Last CAP Review:** 11/2011  
**Next CAP Review:** 11/2012  
**Last Review:** 1/2012

#### Description of Procedure or Service

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Neuromuscular electrical stimulators are divided into two broad categories: therapeutic and functional. Therapeutic electrical stimulation strengthens muscles weakened by disuse while functional electrical stimulation attempts to replace destroyed nerve pathways by electrical stimulation to the muscle in order to assist a functional movement. Procedures or services described in this policy include the following:

- Section I - Neuromuscular Electrical Stimulation (NMES)
- Section II - Threshold Electrical Stimulation
- Section III - Functional Neuromuscular Electrical Stimulation
- Section IV – Peripheral Subcutaneous Field Stimulation

Various electrical stimulation devices are marketed to relieve a wide range of conditions including, but not limited to, muscle or joint pain, stress, insomnia, depression, back pain, migraines, and disuse atrophy. These devices employ forms of electrical stimulation such as monophasic pulsed electric field therapy, microcurrent therapy or other forms of electrotherapy.

**Related Policies:**

Interferential Stimulation

TENS (Transcutaneous Electrical Nerve Stimulation)

*\*\*\*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

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**Neuromuscular Electrical Stimulation (NMES), Functional Neuromuscular Electrical Stimulation, and Peripheral Subcutaneous Field Stimulation are considered investigational for all applications. BCBSNC does not provide coverage for investigational services or procedures.**

**Threshold Electrical Stimulation is considered not medically necessary. BCBSNC does not provide coverage for services or procedures that are not medically necessary.**

#### Benefits Application

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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.

# Neurostimulation, Electrical

## I. Neuromuscular Electrical Stimulation (NMES)

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Neuromuscular electrical stimulation (NMES) is used primarily in the orthopedic setting as treatment before and after orthopedic procedures to strengthen or rehabilitate muscles. The major use of NMES is for prevention and retardation of disuse atrophy in conditions that causes immobilization of a joint or extremity such as post surgical hip or knee arthroplasty.

This device uses electrodes placed on the skin to stimulate motor nerves to alternately contract and relax the muscle. This treatment requires that an intact nerve is available to the muscle that is being rehabilitated.

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### When Neuromuscular Electrical Stimulation (NMES) is covered

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Not applicable.

### When Neuromuscular Electrical Stimulation (NMES) is not covered

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All indications for neuromuscular electrical stimulation (NMES) including disuse atrophy are not covered. Neuromuscular Electrical Stimulation is considered investigational. BCBSNC does not cover investigational services or supplies.

Note: Form-fitting conductive garments used with NMES are considered a convenience item and are not covered.

### Policy Guidelines

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Study results in peer-reviewed literature are insufficient to prove that NMES for disuse atrophy is effective.

### Billing/Coding/Physician Documentation Information

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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](http://www.bcbsnc.com). They are listed in the Category Search on the Medical Policy search page.

*Applicable codes: A4595, E0731, E0744, E0745, L8680, L8681, L8682, L8683, L8685, L8686, L8687, L8688, L8689*

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.

# Neurostimulation, Electrical

## II. Threshold Electrical Stimulation

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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 (CP), 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, the U.S. Food and Drug Administration (FDA) describes these devices as “an electronically powered device intended for medical purposes that repeatedly contracts muscles by passing electrical currents through electrodes contacting the affected body area.”

### When Threshold Electrical Stimulation is covered

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Not applicable.

### When Threshold Electrical Stimulation is not covered

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Threshold electrical stimulation as a treatment of motor disorders, including but not limited to cerebral palsy, is considered not medically necessary.

### Policy Guidelines

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This policy was updated regularly with searches of the MEDLINE database, with the most recent literature search performed through December 2010. The studies published to date demonstrate that threshold electrical stimulation is not effective for treatment of spasticity, muscle weakness, reduced joint mobility, or motor function; therefore the treatment is considered not medically necessary

### Billing and Coding/Physician Documentation Information

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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](http://www.bcbsnc.com). They are listed in the Category Search on the Medical Policy search page.

*Applicable code(s): A4595, E0731, E0745.*

# Neurostimulation, Electrical

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.

## III. Functional Neuromuscular Electrical Stimulation

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Functional neuromuscular electrical stimulation (NMES) is a method being developed to restore function to patients with damaged or destroyed nerve pathways through use of an orthotic device with microprocessor controlled electrical neuromuscular stimulation.

One application of functional NMES is to restore upper extremity functions such as grasp-release, forearm pronation, and elbow extension in patients with stroke, or C5 and C6 tetraplegia (quadraplegia). The Neurocontrol Freehand system received approval from the U.S. Food and Drug Administration (FDA) in 1997 through the pre-market approval (PMA) process. The system is an implantable upper extremity neuroprosthesis intended to improve a patient's ability to grasp, hold, and release objects, and is indicated for use in patients who are tetraplegic due to C5 or C6 spinal cord injury. The implantable Freehand System is no longer marketed in the US, though the company provides maintenance for devices already implanted. The Handmaster NMS I [neuromuscular stimulator] is another device that uses surface electrodes and is purported to provide hand active range of motion and function for patients with stroke or C5 tetraplegia. The Handmaster NMS I system was originally cleared for use in maintaining or improving range of motion, reducing muscle spasm, preventing or retarding muscle atrophy, providing muscle reeducation, and improving circulation; in 2001, its 510(k) marketing clearance was expanded to include provision of hand active range of motion and function for patients with C5 tetraplegia.

Other neural prosthetic devices have been developed for functional NMES in patients with foot drop. Foot drop is weakness of the foot and ankle that causes reduced dorsiflexion and difficulty with ambulation. It can have various causes such as stroke or multiple sclerosis. Functional electrical stimulation of the peroneal nerve has been suggested for these patients as an aid in raising the toes during the swing phase of ambulation. Examples of such devices used for treatment of foot drop are the Innovative Neurotronics' (formerly NeuroMotion, Inc.) WalkAide®, Bioness' radio-frequency controlled NESS L300™, and the Odstock Foot Drop Stimulator. The WalkAide device first received 510(k) marketing clearance from the FDA in the 1990s; the current version of the WalkAide device received 510(k) marketing clearance in September 2005. The Odstock Foot Drop Stimulator received 510(k) marketing clearance in 2005. The Bioness NESS L300 received 510(k) marketing clearance in July 2006. The FDA summaries for the devices state that they are intended to be used in patients with drop foot by assisting with ankle dorsiflexion during the swing phase of gait.

Another application of functional electrical stimulation is to provide spinal cord injured patients with the ability to stand and walk. Generally, only spinal cord injury patients with lesions from T4 to T12 are considered candidates for ambulation systems. Lesions at T1–T3 are associated with poor trunk stability, while lumbar lesions imply lower extremity nerve damage. Using percutaneous stimulation, the device delivers trains of electrical pulses to trigger action potentials at selected nerves at the quadriceps (for knee extension), the common peroneal nerve (for hip flexion), and the paraspinals and gluteals (for trunk stability). Patients use a walker or elbow-support crutches for further support. The electrical impulses are controlled by a computer microchip attached to the patient's belt that synchronizes and distributes the signals. In addition, there is a finger-controlled switch that permits patient activation of the stepping.

To date, the Parastep® Ambulation System is the only noninvasive functional walking neuromuscular stimulation device to receive premarket approval (PMA) from the U.S. Food and Drug Administration (FDA). The Parastep device is approved to “enable appropriately selected skeletally mature spinal cord injured patients (level C6-T12) to stand and attain limited ambulation

# Neurostimulation, Electrical

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and/or take steps, with assistance if required, following a prescribed period of physical therapy training in conjunction with rehabilitation management of spinal cord injury.” Other devices include a reciprocating gait orthosis (RGO) with electrical stimulation. The orthosis used is a cumbersome hip-knee-ankle-foot device linked together with a cable at the hip joint. The use of this device may be limited by the difficulties in putting the device on and taking it off.

Neuromuscular stimulation is also proposed for motor restoration in hemiplegia and spinal cord injury and treatment of secondary dysfunction (e.g., muscle atrophy and alterations in cardiovascular function and bone density) associated with damage to motor nerve pathways. There are commercially available exercycles that use electrical muscle stimulation technology as a means of physical therapy and exercise for spinal cord injury patients. It is thought that these devices may be to promote cardiovascular conditioning, prevent muscle atrophy, and/or maintain bone mass. The patient’s legs are wrapped in fabric strips that contain electrodes to stimulate the muscles, thus permitting the patient to pedal. These exercycles are sometimes called functional neuromuscular exercisers.

## **Related policies:**

Microprocessor Controlled Prosthetic Knees

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## **When Functional Neuromuscular Electrical Stimulation is covered**

Not applicable.

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## **When Functional Neuromuscular Electrical Stimulation is not covered**

Functional neuromuscular stimulation is considered investigational as a technique to restore function following nerve damage or nerve injury. This includes its use in the following situations:

- As a technique to provide ambulation in patients with spinal cord injury; or
- To provide upper extremity function in patients with nerve damage (e.g., spinal cord injury or post-stroke); or
- To improve ambulation in patients with foot drop caused by nerve damage (e.g., post-stroke or in those with multiple sclerosis).

**\*\*\*Note:** Physical fitness equipment (with or without functional neuromuscular electrical stimulation capability) is excluded under most member benefit plans. Member’s benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

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## **Policy Guidelines**

Evidence for functional neuromuscular electrical stimulation to provide functional movement is limited by the small number of subjects and lack of data demonstrating utility outside the research setting. The single randomized trial examining neuromuscular stimulation for foot drop in patients with MS did not demonstrate a clinically significant benefit when compared to no stimulation or a program of exercise.

# Neurostimulation, Electrical

## **Billing and Coding/Physician Documentation Information**

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*Applicable code(s): 64565, 64580, E0764, E0770.*

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.

## **IV. Peripheral Subcutaneous Field Stimulation**

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Peripheral subcutaneous field stimulation is a novel approach for the treatment of severe, chronic neuropathic pain. Electrodes are placed subcutaneously to the area of pain not to the specific nerve center. The area of pain must be consistently localized for this use. The electrical stimulation is proposed to provide paresthesia to the painful area. The exact mechanism in which the pain is relieved is not completely understood. None of the electrodes have FDA approval for this use, making it off-label.

### **When Peripheral Subcutaneous Field Stimulation is covered**

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Not applicable.

### **When Peripheral Subcutaneous Field Stimulation is not covered**

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Peripheral subcutaneous field stimulation is considered investigational for all applications. BCBSNC does not provide coverage for investigational services or procedures.

### **Policy Guidelines**

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The use of electrodes for this indication has not been FDA approved, thus peripheral subcutaneous field stimulation is considered investigational.

## **Billing/Coding/Physician Documentation Information**

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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](http://www.bcbsnc.com). They are listed in the Category Search on the Medical Policy search page.

*Applicable codes: 0282T, 0283T, 0284T, 0285T*

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.

# Neurostimulation, Electrical

## **Scientific Background and Reference Sources**

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### **Policy entitled: Therapeutic Electrical Stimulation (TES)**

Plan Consultant - 12/96

Physician Advisory Group Review 2/97

Medical Policy Advisory Group Review 3/99

Specialty Matched Consultant Advisory Panel - 10/2000

Medical Policy Advisory Group - 10/2000

Specialty Matched Consultant Advisory Panel - 7/2002

BCBSA Medical Policy Reference Manual, 1.01.19; 10/08/02

ECRI Hotline Response: Neuromuscular Electrical Stimulation for Cerebral Palsy and Spina Bifida. (Updated June 11, 2002); accessed 7/18/03 at [www.ecri.org](http://www.ecri.org)

ECRI Hotline Response: Neuromuscular Electrical Stimulation for Disuse Atrophy. (Updated on 9/3/02); accessed 7/18/03 at [www.ecri.org](http://www.ecri.org)

United Cerebral Palsy website regarding "Therapeutic Electrical Stimulation" and "The Use of Electrical Stimulation of Spastic Muscles" accessed 7/18/2003 at [www.ucp.org](http://www.ucp.org)

### **Policy entitled: Functional Neuromuscular Stimulation (FNS)**

BCBSA Medical Policy Reference Manual - 3/96

MEDLINE search January 1996 through July 1997

MEDLINE search July 1997 through August 1999

Medical Policy Advisory Group 12/2/1999

BCBSA Medical Policy Reference Manual, 8.03.01; 4/30/2000

Specialty Matched Consultant Advisory Panel, 8/2001

BCBSA Medical Policy Reference Manual, 8.03.01; 12/18/02

Specialty Matched Consultant Advisory Panel - 7/2003

### **New Policy entitled: Electrical Stimulators, Neuromuscular**

BCBSA Medical Policy Reference Manual [Electronic Version], 1.01.19, 2/25/2004.

BCBSA Medical Policy Reference Manual [Electronic Version], 8.03.01, 2/25/2004.

Specialty Matched Consultant Advisory Panel - 6/2004

Fehlings, D.L., Kirsch, S., McComas, A., Chipman, M., Campbell, K. (2002, November)

# Neurostimulation, Electrical

Evaluation of therapeutic electrical stimulation to improve muscle strength and function in children with types II/III spinal muscular atrophy. *Developmental Medicine and Child*, 44(11), 741-4. Retrieved 4/16/04 from <http://212.49.218.200/newgenMB/asp/Document.asp?docNo=25919>.

BCBSA Medical Policy Reference Manual [Electronic Version], 12/14/2005.

BCBSA Medical Policy Reference Manual [Electronic Version], 8.03.01, 12/14/2005.

Specialty Matched Consultant Advisory Panel - 5/2006

BCBSA Medical Policy Reference Manual [Electronic Version], 1.01.19, 12/12/2006.

BCBSA Medical Policy Reference Manual [Electronic Version], 8.03.01, 12/13/2007.

Specialty Matched Consultant Advisory Panel - 5/2008

BCBSA Medical Policy Reference Manual [Electronic Version], 8.03.01, 10/6/2009

Senior Medical Director Review – 5/2010

BCBSA Medical Policy Reference Manual [Electronic Version], 1.01.19, 9/10/2009

Specialty Matched Consultant Advisory Panel – 11/2010

BCBSA Medical Policy Reference Manual [Electronic Version], 8.03.01, 2/10/2011

BCBSA Medical Policy Reference Manual [Electronic Version], 1.01.19, 2/10/2011

Brosseau L, Wells GA, Finestone HM, et al. Clinical practice guidelines for electrical stimulation. 2006. Retrieved 5/9/2011 from <http://www.guideline.gov/content.aspx?id=9918>.

Monaghan B, Caulfield B, O'Mathúna DP. Surface neuromuscular electrical stimulation for quadriceps strengthening pre and post total knee replacement. *Cochrane Database Syst Rev*, 2010;(1):CD007177.

Medical Director – 6/2011

Specialty Matched Consultant Advisory Panel – 11/2011

## **Policy Name Change: Neurostimulation, Electrical**

BCBSA Medical Policy Reference Manual [Electronic Version], 1.01.19, 11/10/2011

Medical Director – 1/2012

BCBSA Medical Policy Reference Manual [Electronic Version], 8.03.01, 2/9/12

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## **Policy Implementation/Update Information**

### **Policy entitled: Therapeutic Electrical Stimulation (TES)**

2/97 Original Policy issued: Physician Advisory Group Review

# Neurostimulation, Electrical

- 4/99 Reaffirmed based on Medical Policy Advisory Group
- 8/99 Reformatted, Medical Term Definitions added.
- 5/00 System coding change.
- 10/00 Specialty Matched Consultant Advisory Panel. No change recommended in criteria. System coding changes. Medical Policy Advisory Group review. No change in criteria. Approve.
- 2/02 Coding format change.
- 8/02 Specialty Matched Consultant Advisory Panel review 7/12/2002. No changes.
- 8/03 Description and Benefits Application sections revised. Key words added.

## **Policy entitled: Functional Neuromuscular Stimulation (FNS)**

- 3/80 Original Policy: Experimental/Investigative
- 6/83 Reaffirmed
- 8/88 Reviewed: Investigational
- 9/99 Reformatted, Medical Term Definitions added.
- 12/99 Reaffirmed, Medical Policy Advisory Group
- 3/01 System changes.
- 9/01 Specialty Matched Consultant Advisory Panel, 8/2001. Format changes.
- 7/03 Specialty Matched Consultant Advisory Panel, 7/15/03. No changes to criteria. Benefits Application section revised.
- 4/04 Billing/Coding section updated for consistency.

## **New Policy created entitled: Electrical Stimulators, Neuromuscular**

- 7/29/04 Combined policies on Therapeutic Electrical Stimulation (TES) and Functional Neuromuscular Stimulation (FNS) and added section related to Neuromuscular Electrical Stimulation (NMES) for disuse atrophy. Therapeutic Electrical Stimulator (TES), Functional Neuromuscular Stimulation (FNS), and Neuromuscular Electrical Stimulation (NMES) for disuse atrophy are considered investigational. Specialty Matched Consultant Advisory Panel review 6/22/2004. References added. Notification given 7/29/2004. Effective date 10/14/2004.
- 1/5/06 Added 2006 HCPCS code E0764 to "Billing/Coding" section. Deleted HCPCS code E0752 from "Billing/Coding: section.
- 6/5/06 Specialty Matched Consultant Advisory Panel review 5/3/2006. No changes to policy intent. Removed "for disuse atrophy" from title in the "Neuromuscular Electrical Stimulation" section. Added statement to "When Neuromuscular Electrical Stimulation is Not Covered" to state; "All indications for neuromuscular stimulation (NMES) including

# Neurostimulation, Electrical

disuse atrophy are not covered." Rationale added to "Policy Guidelines" for all sections. References added.

- 9/18/06 Added statement "Note: Form-fitting conductive garments used with NMES are considered a convenience item and are not covered." to the "When Not Covered" section.
- 1/17/07 Added HCPCS codes L8680, L8681, L8682, L8683, L8685, L8686, L8687, L8688, and L8689 to the "Billing/Coding" section.
- 6/30/08 Specialty Matched Consultant Advisory Panel review 5/29/08. No change to policy statement. References added.
- 1/5/09 Added new HCPCS code E0770 to "Billing/Coding" section. (btw)
- 06/22/10 Policy number(s) removed. "Description" sections revised. "Therapeutic" removed from the name of Threshold Electrical Stimulation throughout policy as appropriate. Information added to the "Functional Neuromuscular Electrical Stimulation" section to indicate; Neuromuscular stimulation is considered investigational as a technique to restore function following nerve damage or nerve injury. This includes its use in the following situations: \*As a technique to provide ambulation in patients with spinal cord injury; or \*To provide upper extremity function in patients with nerve damage (e.g., spinal cord injury or post-stroke); or \*To improve ambulation in patients with foot drop caused by nerve damage (e.g., post-stroke or in those with multiple sclerosis)." No change to policy intent. Reviewed by Senior Medical Director 5/26/10. References added. (btw)
- 12/21/10 Specialty Matched Consultant Advisory Panel review 11/29/2010. No changes to policy statements. Removed statement from the "Functional Neuromuscular Electrical Stimulation" "Description" section, "These applications are not addressed in this policy." References added. (btw)
- 6/21/11 Added HCPCS code, E0744 to "Billing/Coding" in the NMES section. "Description" section related to Threshold Electrical Stimulation revised. Removed reference to "Threshold Electrical Stimulation from the investigational policy statement. Added the following in the "Policy" section; "Threshold Electrical Stimulation is considered not medically necessary. BCBSNC does not provide coverage for services or procedures that are not medically necessary." Changed the statement in the "When Not Covered" section to indicate; "Threshold electrical stimulation as a treatment of motor disorders, including but not limited to cerebral palsy, is considered not medically necessary." "Policy Guidelines" revised. Reviewed with Medical Director 6/6/2011. References added. (btw)
- 7/19/11 Updated "Description" section under Functional Neuromuscular Electrical Stimulation. Added statement in the Functional Neuromuscular Electrical Stimulation's "When Not Covered" section to indicate \*\*\***Note:** Physical fitness equipment (with or without functional neuromuscular electrical stimulation capability) is excluded under most member benefit plans. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy." No change to policy intent. Medical Director review 7/1/2011. (btw)

## **Policy Name Change: Neurostimulation, Electrical**

- 1/24/12 Policy name changed to Neurostimulation, Electrical. Specialty Matched Consultant Advisory Panel review 11/30/11. "Description" section updated under the "Functional Neuromuscular Electrical Stimulation" part of the policy. Section IV added to policy to address Peripheral Subcutaneous Field Stimulation. "Peripheral subcutaneous field stimulation is considered investigational for all applications. BCBSNC does not provide

# Neurostimulation, Electrical

coverage for investigational services or procedures.” New 2012 CPT codes added to “Billing/Coding” section: 0282T, 0283T, 0284T, 0285T. Reference added. (btw)

5/1/12 Reference added. (btw)

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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.