



MASSACHUSETTS

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## Medical Policy

# Electrical Stimulation of the Spine as an Adjunct to Spinal Fusion Procedures

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### Policy Number: 498

BCBSA Reference Number: 7.01.85 (For Plan internal use only)

NCD/LCD: NA

### Related Policies

- Ultrasound Accelerated Fracture Healing Device, [#497](#)
- Electrical Bone Growth Stimulation of the Appendicular Skeleton, [#499](#)
- Bone Morphogenetic Protein, [#097](#)

### Policy

#### Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity Medicare HMO Blue<sup>SM</sup> and Medicare PPO Blue<sup>SM</sup> Members

Either invasive or noninvasive methods of electrical bone growth stimulation may be **MEDICALLY NECESSARY** as an *adjunct* to lumbar spinal fusion surgery in patients at high risk for fusion failure, defined as any one of the following criteria:

- One or more previous failed spinal fusion(s),
- Grade III or worse spondylolisthesis,
- Fusion to be performed at more than one level,
- Current tobacco use,
- Diabetes,
- Renal disease,
- Alcoholism, and
- Steroid use.

Noninvasive electrical bone stimulation may be **MEDICALLY NECESSARY** as a treatment of patients with failed lumbar spinal fusion. Failed spinal fusion is defined as a spinal fusion that has not healed at a minimum of 6 months after the original surgery, as evidenced by serial x-rays over a course of 3 months.

Semi-invasive electrical stimulation is **INVESTIGATIONAL** as an adjunct to lumbar fusion surgery and for failed lumbar fusion.

Non-invasive electrical bone growth stimulation for treatments that do not meet the criteria noted above are **INVESTIGATIONAL**.

Invasive, semi-invasive, and noninvasive electrical stimulation are **INVESTIGATIONAL** as an adjunct to cervical fusion surgery and for failed cervical spine fusion.

### Prior Authorization Information

#### Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

#### Outpatient

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

	Outpatient
Commercial Managed Care (HMO and POS)	Prior authorization is <b>not required</b> .
Commercial PPO and Indemnity	Prior authorization is <b>not required</b> .
Medicare HMO Blue <sup>SM</sup>	Prior authorization is <b>not required</b> .
Medicare PPO Blue <sup>SM</sup>	Prior authorization is <b>not required</b> .

### CPT Codes / HCPCS Codes / ICD Codes

*Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.*

*Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.*

*The following codes are included below for informational purposes only; this is not an all-inclusive list.*

The above **medical necessity criteria MUST** be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity:

#### CPT Codes

CPT codes:	Code Description
20974	Electrical stimulation to aid bone healing; noninvasive (non-operative)
20975	Electrical stimulation to aid bone healing; invasive (operative)

#### HCPCS Codes

HCPCS codes:	Code Description
E0749	Osteogenesis stimulator, electrical (surgically implanted)

The above **medical necessity criteria MUST** be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity:

#### HCPCS Codes

HCPCS codes:	Code Description
E0748	Osteogenesis stimulator, electrical, non-invasive, spinal applications

The following ICD Diagnosis Codes are considered medically necessary when submitted with the HCPCS code above if **medical necessity criteria** are met:

#### ICD-10 Diagnosis Codes

<b>ICD-10-CM Diagnosis codes:</b>	<b>Code Description</b>
E10.10	Type 1 Diabetes Mellitus With Ketoacidosis Without Coma
E10.11	Type 1 Diabetes Mellitus With Ketoacidosis With Coma
E10.21	Type 1 Diabetes Mellitus With Diabetic Nephropathy
E10.22	Type 1 Diabetes Mellitus With Diabetic Chronic Kidney Disease
E10.29	Type 1 Diabetes Mellitus With Other Diabetic Kidney Complication
E10.311	Type 1 Diabetes Mellitus With Unspecified Diabetic Retinopathy With Macular Edema
E10.319	Type 1 Diabetes Mellitus With Unspecified Diabetic Retinopathy Without Macular Edema
E10.3211	Type 1 Diabetes Mellitus With Mild Nonproliferative Diabetic Retinopathy With Macular Edema, Right Eye
E10.3212	Type 1 Diabetes Mellitus With Mild Nonproliferative Diabetic Retinopathy With Macular Edema, Left Eye
E10.3213	Type 1 Diabetes Mellitus With Mild Nonproliferative Diabetic Retinopathy With Macular Edema, Bilateral
E10.3219	Type 1 Diabetes Mellitus With Mild Nonproliferative Diabetic Retinopathy With Macular Edema, Unspecified Eye
E10.3291	Type 1 Diabetes Mellitus With Mild Nonproliferative Diabetic Retinopathy Without Macular Edema, Right Eye
E10.3292	Type 1 Diabetes Mellitus With Mild Nonproliferative Diabetic Retinopathy Without Macular Edema, Left Eye
E10.3293	Type 1 Diabetes Mellitus With Mild Nonproliferative Diabetic Retinopathy Without Macular Edema, Bilateral
E10.3299	Type 1 Diabetes Mellitus With Mild Nonproliferative Diabetic Retinopathy Without Macular Edema, Unspecified Eye
E10.3311	Type 1 Diabetes Mellitus With Moderate Nonproliferative Diabetic Retinopathy With Macular Edema, Right Eye
E10.3312	Type 1 Diabetes Mellitus With Moderate Nonproliferative Diabetic Retinopathy With Macular Edema, Left Eye
E10.3313	Type 1 Diabetes Mellitus With Moderate Nonproliferative Diabetic Retinopathy With Macular Edema, Bilateral
E10.3319	Type 1 Diabetes Mellitus With Moderate Nonproliferative Diabetic Retinopathy With Macular Edema, Unspecified Eye
E10.3391	Type 1 Diabetes Mellitus With Moderate Nonproliferative Diabetic Retinopathy Without Macular Edema, Right Eye
E10.3392	Type 1 Diabetes Mellitus With Moderate Nonproliferative Diabetic Retinopathy Without Macular Edema, Left Eye
E10.3393	Type 1 Diabetes Mellitus With Moderate Nonproliferative Diabetic Retinopathy Without Macular Edema, Bilateral
E10.3399	Type 1 Diabetes Mellitus With Moderate Nonproliferative Diabetic Retinopathy Without Macular Edema, Unspecified Eye
E10.3411	Type 1 Diabetes Mellitus With Severe Nonproliferative Diabetic Retinopathy With Macular Edema, Right Eye
E10.3412	Type 1 Diabetes Mellitus With Severe Nonproliferative Diabetic Retinopathy With Macular Edema, Left Eye
E10.3413	Type 1 Diabetes Mellitus With Severe Nonproliferative Diabetic Retinopathy With Macular Edema, Bilateral
E10.3419	Type 1 Diabetes Mellitus With Severe Nonproliferative Diabetic Retinopathy With Macular Edema, Unspecified Eye
E10.3491	Type 1 Diabetes Mellitus With Severe Nonproliferative Diabetic Retinopathy Without Macular Edema, Right Eye
E10.3492	Type 1 Diabetes Mellitus With Severe Nonproliferative Diabetic Retinopathy Without Macular Edema, Left Eye

E10.3493	Type 1 Diabetes Mellitus With Severe Nonproliferative Diabetic Retinopathy Without Macular Edema, Bilateral
E10.3499	Type 1 Diabetes Mellitus With Severe Nonproliferative Diabetic Retinopathy Without Macular Edema, Unspecified Eye
E10.3511	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Macular Edema, Right Eye
E10.3512	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Macular Edema, Left Eye
E10.3513	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Macular Edema, Bilateral
E10.3519	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Macular Edema, Unspecified Eye
E10.3521	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Traction Retinal Detachment Involving The Macula, Right Eye
E10.3522	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Traction Retinal Detachment Involving The Macula, Left Eye
E10.3523	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Traction Retinal Detachment Involving The Macula, Bilateral
E10.3529	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Traction Retinal Detachment Involving The Macula, Unspecified Eye
E10.3531	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Traction Retinal Detachment Not Involving The Macula, Right Eye
E10.3532	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Traction Retinal Detachment Not Involving The Macula, Left Eye
E10.3533	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Traction Retinal Detachment Not Involving The Macula, Bilateral
E10.3539	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Traction Retinal Detachment Not Involving The Macula, Unspecified Eye
E10.3541	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Combined Traction Retinal Detachment And Rhegmatogenous Retinal Detachment, Right Eye
E10.3542	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Combined Traction Retinal Detachment And Rhegmatogenous Retinal Detachment, Left Eye
E10.3543	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Combined Traction Retinal Detachment And Rhegmatogenous Retinal Detachment, Bilateral
E10.3549	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy With Combined Traction Retinal Detachment And Rhegmatogenous Retinal Detachment, Unspecified Eye
E10.3551	Type 1 Diabetes Mellitus With Stable Proliferative Diabetic Retinopathy, Right Eye
E10.3552	Type 1 Diabetes Mellitus With Stable Proliferative Diabetic Retinopathy, Left Eye
E10.3553	Type 1 Diabetes Mellitus With Stable Proliferative Diabetic Retinopathy, Bilateral
E10.3559	Type 1 Diabetes Mellitus With Stable Proliferative Diabetic Retinopathy, Unspecified Eye
E10.3591	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy Without Macular Edema, Right Eye
E10.3592	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy Without Macular Edema, Left Eye
E10.3593	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy Without Macular Edema, Bilateral
E10.3599	Type 1 Diabetes Mellitus With Proliferative Diabetic Retinopathy Without Macular Edema, Unspecified Eye
E10.37X1	Type 1 Diabetes Mellitus With Diabetic Macular Edema, Resolved Following Treatment, Right Eye
E10.37X2	Type 1 Diabetes Mellitus With Diabetic Macular Edema, Resolved Following Treatment, Left Eye
E10.37X3	Type 1 Diabetes Mellitus With Diabetic Macular Edema, Resolved Following Treatment, Bilateral

E10.37X9	Type 1 Diabetes Mellitus With Diabetic Macular Edema, Resolved Following Treatment, Unspecified Eye
E10.39	Type 1 Diabetes Mellitus With Other Diabetic Ophthalmic Complication
E10.40	Type 1 Diabetes Mellitus With Diabetic Neuropathy, Unspecified
E10.41	Type 1 Diabetes Mellitus With Diabetic Mononeuropathy
E10.42	Type 1 Diabetes Mellitus With Diabetic Polyneuropathy
E10.43	Type 1 Diabetes Mellitus With Diabetic Autonomic (Poly)Neuropathy
E10.44	Type 1 Diabetes Mellitus With Diabetic Amyotrophy
E10.49	Type 1 Diabetes Mellitus With Other Diabetic Neurological Complication
E10.51	Type 1 Diabetes Mellitus With Diabetic Peripheral Angiopathy Without Gangrene
E10.52	Type 1 Diabetes Mellitus With Diabetic Peripheral Angiopathy With Gangrene
E10.59	Type 1 Diabetes Mellitus With Other Circulatory Complications
E10.610	Type 1 Diabetes Mellitus With Diabetic Neuropathic Arthropathy
E10.618	Type 1 Diabetes Mellitus With Other Diabetic Arthropathy
E10.620	Type 1 Diabetes Mellitus With Diabetic Dermatitis
E10.621	Type 1 Diabetes Mellitus With Foot Ulcer
E10.622	Type 1 Diabetes Mellitus With Other Skin Ulcer
E10.628	Type 1 Diabetes Mellitus With Other Skin Complications
E10.630	Type 1 Diabetes Mellitus With Periodontal Disease
E10.638	Type 1 Diabetes Mellitus With Other Oral Complications
E10.641	Type 1 Diabetes Mellitus With Hypoglycemia With Coma
E10.649	Type 1 Diabetes Mellitus With Hypoglycemia Without Coma
E10.65	Type 1 Diabetes Mellitus With Hyperglycemia
E10.69	Type 1 Diabetes Mellitus With Other Specified Complication
E10.8	Type 1 Diabetes Mellitus With Unspecified Complications
E10.9	Type 1 Diabetes Mellitus Without Complications
E11.00	Type 2 Diabetes Mellitus With Hyperosmolarity Without Nonketotic Hyperglycemic-Hyperosmolar Coma (Nkhhc)
E11.01	Type 2 Diabetes Mellitus With Hyperosmolarity With Coma
E11.10	Type 2 Diabetes Mellitus With Ketoacidosis Without Coma
E11.11	Type 2 Diabetes Mellitus With Ketoacidosis With Coma
E11.21	Type 2 Diabetes Mellitus With Diabetic Nephropathy
E11.22	Type 2 Diabetes Mellitus With Diabetic Chronic Kidney Disease
E11.29	Type 2 Diabetes Mellitus With Other Diabetic Kidney Complication
E11.311	Type 2 Diabetes Mellitus With Unspecified Diabetic Retinopathy With Macular Edema
E11.319	Type 2 Diabetes Mellitus With Unspecified Diabetic Retinopathy Without Macular Edema
E11.3211	Type 2 Diabetes Mellitus With Mild Nonproliferative Diabetic Retinopathy With Macular Edema, Right Eye
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E11.3559	Type 2 Diabetes Mellitus With Stable Proliferative Diabetic Retinopathy, Unspecified Eye
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E11.3593	Type 2 Diabetes Mellitus With Proliferative Diabetic Retinopathy Without Macular Edema, Bilateral
E11.3599	Type 2 Diabetes Mellitus With Proliferative Diabetic Retinopathy Without Macular Edema, Unspecified Eye
E11.36	Type 2 Diabetes Mellitus With Diabetic Cataract
E11.37X1	Type 2 Diabetes Mellitus With Diabetic Macular Edema, Resolved Following Treatment, Right Eye
E11.37X2	Type 2 Diabetes Mellitus With Diabetic Macular Edema, Resolved Following Treatment, Left Eye
E11.37X3	Type 2 Diabetes Mellitus With Diabetic Macular Edema, Resolved Following Treatment, Bilateral
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E11.42	Type 2 Diabetes Mellitus With Diabetic Polyneuropathy
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E11.628	Type 2 Diabetes Mellitus With Other Skin Complications
E11.630	Type 2 Diabetes Mellitus With Periodontal Disease
E11.638	Type 2 Diabetes Mellitus With Other Oral Complications
E11.641	Type 2 Diabetes Mellitus With Hypoglycemia With Coma
E11.649	Type 2 Diabetes Mellitus With Hypoglycemia Without Coma
E11.65	Type 2 Diabetes Mellitus With Hyperglycemia
E11.69	Type 2 Diabetes Mellitus With Other Specified Complication
E11.8	Type 2 Diabetes Mellitus With Unspecified Complications
E11.9	Type 2 Diabetes Mellitus Without Complications

F10.10	Alcohol abuse, uncomplicated
F10.11	Alcohol abuse, in remission
F10.20	Alcohol dependence, uncomplicated
F10.21	Alcohol dependence, in remission
M43.15	Spondylolisthesis, thoracolumbar region
M43.16	Spondylolisthesis, lumbar region
M43.17	Spondylolisthesis, lumbosacral region
M96.0	Pseudarthrosis after fusion or arthrodesis
N18.1	Chronic kidney disease, stage 1
N18.2	Chronic kidney disease, stage 2 (mild)
N18.30	Chronic kidney disease, stage 3 unspecified
N18.31	Chronic kidney disease, stage 3a
N18.32	Chronic kidney disease, stage 3b
N18.4	Chronic kidney disease, stage 4 (severe)
N18.5	Chronic kidney disease, stage 5
N18.6	End stage renal disease
N18.9	Chronic kidney disease, unspecified
Z72.0	Tobacco use
Z79.51	Long term (current) use of inhaled steroids
Z79.52	Long term (current) use of systemic steroids

## Description

### Electrical Bone Growth Stimulators

Both invasive and noninvasive electrical bone growth stimulators have been investigated as an adjunct to spinal fusion surgery, with or without associated instrumentation, to enhance the probability of obtaining a solid spinal fusion. Noninvasive devices have also been investigated to treat a failed fusion.

Electrical and electromagnetic fields can be generated and applied to bones through surgical, noninvasive, and semi-invasive methods.

### Invasive Stimulators

Invasive devices require surgical implantation of a current generator in an intramuscular or subcutaneous space, with an accompanying electrode implanted within the fragments of bone graft at the fusion site. The implantable device typically remains functional for six to nine months after implantation, and although the current generator is removed in a second surgical procedure when stimulation is completed, the electrode may or may not be removed. Implantable electrodes provide constant stimulation at the nonunion or fracture site but carry increased risks associated with implantable leads.

### Noninvasive Stimulators

Noninvasive electrical bone growth stimulators generate a weak electrical current within the target site using either pulsed electromagnetic fields, capacitive coupling, or combined magnetic fields. In capacitive coupling, small skin pads/electrodes are placed on either side of the fusion site and are worn for 24 hours a day until healing occurs, or for up to 9 months. In contrast, pulsed electromagnetic fields are delivered via treatment coils that are placed into a back brace or directly onto the skin and are worn for six to eight hours a day for three to six months. Combined magnetic fields deliver a time-varying magnetic field by superimposing the time-varying field onto an additional static magnetic field. This device involves 30 minutes of treatment daily for 9 months. Patient compliance may be an issue with externally worn devices.

### Semi-Invasive Stimulators

Semi-invasive (semi-implantable) stimulators use percutaneous electrodes and an external power supply, obviating the need for a surgical procedure to remove the generator when treatment is finished.

## Summary

Both invasive and noninvasive electrical bone growth stimulators have been investigated as an adjunct to spinal fusion surgery, with or without associated instrumentation, to enhance the probability of obtaining a



solid spinal fusion. Noninvasive devices have also been investigated in patients who are at normal risk of failed fusion and to treat a failed fusion.

For individuals who are at high-risk of lumbar spinal fusion surgery failure who receive invasive or noninvasive electrical bone growth stimulation, the evidence includes systematic reviews, a TEC Assessment, and randomized controlled trials. Relevant outcomes are symptoms, change in disease status, and functional outcomes. Results from these trials have indicated that in patients with risk factors for failed fusion surgery, either invasive or noninvasive electrical bone stimulation increases the fusion rate. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have failed lumbar spinal fusion surgery who receive noninvasive electrical bone growth stimulation, the evidence includes a TEC Assessment and studies with patients serving as their own controls. Relevant outcomes are symptoms, change in disease status, and functional outcomes. Data have shown that noninvasive electrical stimulation improves fusion rates in this population. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who are undergoing cervical spinal fusion surgery or have failed cervical spine fusion who receive invasive or noninvasive electrical bone growth stimulation, the evidence includes a randomized controlled trial. Relevant outcomes are symptoms, change in disease status, and functional outcomes. The only controlled trial published to date had methodologic limitations, and the efficacy of electrical stimulation in the cervical spine has not been established. An open-label multicenter cohort study provided evidence to demonstrate that patients at high-risk for arthrodesis following anterior cervical discectomy and fusion procedures reported statistically significant improvements in fusion rates with pulsed electromagnetic field stimulation. However, limitations in the study design, including use of a historical control group, lack of blinding, and no restrictions on surgical methods used by surgeons, preclude definitive assessments of treatment efficacy. The evidence is insufficient to determine the effects of the technology on health outcomes.

## Policy History

Date	Action
11/2022	Clarified coding information.
6/2022	Annual policy review. Policy statements unchanged.
5/2021	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
6/2020	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
5/2019	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
5/2018	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
5/2017	Annual policy review. New references added.
5/2016	Annual policy review. New references added.
12/2014	Annual policy review. New references added.
12/2013	Added LCD: L11501 to the policy.
11/2011-4/2012	Medical policy ICD 10 remediation: Formatting, editing and coding updates. No changes to policy statements.
6/2011	Reviewed - Medical Policy Group - Orthopedics, Rehabilitation Medicine and Rheumatology. No changes to policy statements.
4/2011	Annual policy review. No changes to policy statements.
7/2010	Reviewed - Medical Policy Group - Orthopedics, Rehabilitation Medicine and Rheumatology. No changes to policy statements.
12/2009	Annual policy review. Changes to policy statements.
7/2009	Reviewed - Medical Policy Group - Orthopedics, Rehabilitation Medicine and Rheumatology. No changes to policy statements.

7/2008	Reviewed - Medical Policy Group - Orthopedics, Rehabilitation Medicine and Rheumatology. No changes to policy statements.
7/2007	Reviewed - Medical Policy Group - Orthopedics, Rehabilitation Medicine and Rheumatology. No changes to policy statements.
6/2007	Annual policy review. Changes to policy statements.

## Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:

[Medical Policy Terms of Use](#)

[Managed Care Guidelines](#)

[Indemnity/PPO Guidelines](#)

[Clinical Exception Process](#)

[Medical Technology Assessment Guidelines](#)

## References

1. Blue Cross and Blue Shield Association Technology Evaluation Center (TEC). Electrical bone growth stimulation as an adjunct to spinal fusion surgery (invasive method). TEC Evaluations. 1992 324-351.
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