MEDICAL POLICY

Medical Policy Title	**Electromagnetic and Pulsed Field Stimulation**
Policy Number	**1.01.59**
Current Effective Date	**January 1, 2027**
Next Review Date	**May 2027**

Our medical policies are guides to evaluate technologies or services for medical necessity. Criteria are established through the assessment of evidence based, peer-reviewed scientific literature, and national professional guidelines. Federal and state law(s), regulatory mandates and the member's subscriber contract language are considered first in the determination of a covered service.
(Link to Product Disclaimer)

POLICY STATEMENT(S)

I. The following forms of electromagnetic and pulsed field stimulation are **investigational**:

A. Peripheral Magnetic Stimulation, including Transcutaneous Electro Magnetic Peripheral Nerve Stimulation (mPNS)(e.g., Axon Therapy, MagVenture Pain Therapy) for chronic neuropathic pain;

B. Pulsed Electrical Stimulation (PES), including BioniCare when used to facilitate repair of cartilage in patients with arthritis (e.g., MedRelief ST Series, and Jstim1000);

C. Targeted Electromagnetic Field Stimulation (e.g., SofPulse);

D. Electromagnetic Stimulation (e.g., OrthoCor Active Knee System);

RELATED POLICIES

Corporate Medical Policy

1.01.07 Oral Appliance for the Treatment of Obstructive Sleep Apnea

1.01.19 Pelvic Floor Electrical Stimulation as a Treatment for Urinary or Fecal Incontinence

1.01.53 Bone Growth Stimulators

1.01.58 Cranial and Auricular Neuromodulation

1.01.60 Implantable and Invasive Neuromodulation Systems

1.01.61 Non-Invasive Surface Electrical Stimulation for Pain and Rehabilitation

1.01.62 Specialized Neuromodulation for Specific Conditions

7.01.05 Vagus Nerve Stimulation and Vagus Nerve Blocking Therapy

7.01.10 Sacral Nerve Stimulation

7.01.41 Surgical Management of Sleep Disorders

8.01.22 Tibial Nerve Stimulation (TNS) for Voiding Dysfunction

11.01.03 Experimental or Investigational Services

POLICY GUIDELINE(S)

Not Applicable

DESCRIPTION

Peripheral sensory nerve fibers are classified according to their diameter, myelination, and conduction velocity. A fibers are sub-classified into A-alpha, A-beta, and A-delta types. These types of fibers are large, fast, myelinated and have the lowest activation threshold. When activated, they inhibit pain transmission in the spinal cord via proprioceptive and motor afferent signals. B fibers are small, lightly myelinated and carry preganglionic autonomic signals. They are activated after A fibers, but before C fibers and can contribute to responses in the autonomic nervous system such as vasodilation or sympathetic modulation when stimulated. They aren't often the primary targets in pain treatment. C fibers are the smallest of the fibers with the highest activation threshold and have limited capability to be selective in terms of blocking currents through the nerves.

Canonical Erlanger-Gasser Classification of fiber types in sensory peripheral nerves (Olausson et al 2024)

Fiber Type	Function	Average Diameter (µm)	Average conduction velocity (m/s)
Aα (A-alpha)	Myelinated, Primary muscle spindles, Golgi tendon organs	15	100
Aβ (A-beta)	Myelinated, Cutaneous touch and pressure afferents	8	50
Aδ (A-delta)	Myelinated, Cutaneous temperature (cold) and 'fast' pain	<3	15
C	Unmyelinated, Cutaneous pain ('slow' pain) and temperature (warmth and cold)	1	1

Magnetic stimulation of peripheral nerves (mPNS) has been described in the literature as a pain-free alternative to electrical stimulation. mPNS does not require tissue contact yet has a deeper penetration depth. It uses a time-varying field to generate currents through electromagnetic induction, easily targeting Aδ fibers rather than Aβ fibers through electrodes at the skin's surface (Sayed et al 2023). The activation of the Aδ fibers is thought to impact sharp pinprick type pain (Olausson et al 2024).

Neuralace Medical, the creator of Axon Therapy differentiates its device from PNS by using “low frequency magnetic pulses to engage sensory, pain, and motor fibers mechanistically” and reports to provide “long-term relief for the root cause of post-trauma and post-surgical neuropathic pain.”

MagVenture Pain Therapy devices (Tonika Elektronik A/S) are intended for use in the hospital and clinics.

Targeted Electromagnetic Field (e.g., SofPulse, OrthoCor)

Electrical and electromagnetic stimulation are being investigated to improve functional status, as well as to relieve pain related to osteoarthritis and rheumatoid arthritis that are unresponsive to other standard therapies. Noninvasive electrical stimulators generate a weak electrical current within the target site using pulsed electromagnetic fields, capacitive coupling, or combined magnetic fields. In capacitive coupling, small skin pads or electrodes are placed on either side of the knee or wrist. Electrical stimulation is provided by an electronic device that noninvasively delivers a subsensory low-voltage, monophasic electrical field to the target site of pain. Pulsed electromagnetic fields are delivered via treatment coils placed over the skin. Combined magnetic fields deliver a time-varying field by superimposing that field onto an additional static magnetic field.

In basic research studies, pulsed electrical stimulation has been shown to alter chondrocyte-related gene expression in vitro and to have regenerative effects in animal models of cartilage injury. It is proposed that the device treats the underlying cause of the disease by stimulating the joint tissue and improving the overall health of the joint and that it provides a slow-acting, but longer-lasting improvement in symptoms. Therefore, pulsed electrical stimulation is proposed to be similar to bone stimulator therapy for fracture nonunion.

The OrthoCor Active Knee System (OrthoCor Medical; acquired by Caerus Corp) uses pulsed electromagnetic field energy at a radiofrequency of 27.12 MHz to treat pain. The OrthoCor Knee System is classified as a short-wave diathermy device for use other than applying therapeutic deep heat. It is indicated for adjunctive use in the palliative treatment of postoperative pain and edema in superficial soft tissue and for the treatment of muscle and joint aches and pain associated with overexertion, strains, sprains, and arthritis. the SofPulse (also called Torino II, 912-M10, and Roma; Ivivi Health Sciences, renamed Amp Orthopedics) was cleared for marketing as a short-wave diathermy device that applies electromagnetic energy at a radiofrequency of 27.12 MHz. The device is indicated for adjunctive use in the palliative treatment of postoperative pain and edema in superficial soft tissue.

SUPPORTIVE LITERATURE

Soliman and colleagues (2025) conducted a meta-analysis of 313 double-blind randomized controlled trials (RCTs) evaluating participants of any age with neuropathic pain. A total of 284 studies were pharmacological, while only 29 were related to neuromodulation. Included in the analysis were any pharmacological or neuromodulation intervention if administered for at least 3 weeks of follow up if after a single administration, had at least 3 weeks of follow up. The primary efficacy outcome was the proportion of responders (defined as having at least a 50% reduction in baseline pain intensity. The primary safety outcome was the number of participants who withdrew from the treatment due to adverse events. Duration of the included trials was 3-24 weeks, with a median of 8 weeks. Given the

low certainty of evidence, authors were not able to confidently make treatment recommendations for specific populations, and there were no evidence of superiority to any of the drugs included in head-to-head trials. Tri-cyclic antidepressants, serotonin and norepinephrine reuptake inhibitors (SNRIs) and α2δ-ligands are recommended as first line treatments, followed by topical treatments. Regarding neuromodulation (which included 29 sham-controlled trials of both invasive and non-invasive techniques) trials, the majority of results were inconclusive, stating a need for large, double-blind sham controlled, parallel trials over clinically relevant timeframes to examine efficacy and safety.

Pulsed Electrical Stimulation

PES has been investigated over several decades. There have been no clinical studies to date that have developed standardized stimulation parameters, provided accurate comprehensive reporting of electrical conditions, or consistent clinical results (Zimmerman et al 2024). Given this, conclusions cannot be formulated as to its ability to positively impact the net health outcome.

Pulsed Electromagnetic Fields

Yang et al (2020) published a systematic review evaluating the effects of pulsed electromagnetic field therapy on pain, stiffness, physical function, and quality of life in patients with osteoarthritis. The meta-analysis included 15 small, sham- or placebo-controlled studies published between 1993 and 2016. Only two studies were deemed to be at low risk of bias. Overall, the quality of evidence was deemed low or very low. A statistically significant beneficial treatment effect was noted for pain (standardized mean difference [SMD], 1.06; 95% confidence interval [CI], 0.61 to 1.51), stiffness (SMD, 0.37; 95% CI, 0.07 to 0.67), and physical function (SMD, 0.46; 95% CI, 0.14 to 0.78), but not quality of life (SMD, 1.49; 95% CI, -0.06 to 3.04). Only pain outcomes were considered clinically significant. Studies were limited to the short-term effects of pulsed electromagnetic field therapy, with study follow-up durations ranging from 10 days to 12 weeks. Additionally, the high levels of heterogeneity across the outcome measures made harmonization difficult, the included studies had small sample sizes, and there was a lack of an intention-to-treat analysis in many of the included studies.

Tong et al (2022) conducted a systematic review of 11 randomized trials in which patients with osteoarthritis received pulsed electromagnetic fields or control treatment. Of the studies, six had a sham group and five studies used other treatments including hot packs, TENS, physiotherapy, and ultrasound. Many of the trials described below were included in the analysis, along with some additional studies. Risk of bias was high in six studies, moderate in two studies, and low in three studies. The main outcomes measured the efficacy of pulsed electromagnetic field stimulation on osteoarthritis-related soreness, stiffness, and physical function assessed by visual analog scale (VAS) and/or Western Ontario and McMaster University Arthritis Index (WOMAC) scores. Compared to controls, pulsed electromagnetic field stimulation significantly reduced pain (SMD, 0.71; 95% CI, 0.08 to 1.34; p=.03; I^2=93%). There were also significant differences in stiffness (SMD, 1.34; 95% CI, 0.45 to 2.23; p=.003; I^2=99%) and physical function (SMD, 1.52; 95% CI, 0.49 to 2.55; p=.004; I^2=95%) with pulsed electromagnetic field stimulation. All three outcomes were significantly better with pulsed electromagnetic field stimulation compared to sham treatment but not compared to other treatments. Limitations of the analysis included the small number of studies, high heterogeneity, and the combined analysis of sham and other interventions.

Yabroudi et al (2024) evaluated the effects of pulsed electromagnetic field therapy combined with progressive resistance exercise (PRE) in improving physical function and pain in patients with knee osteoarthritis. Patients were randomized to receive either 24 sessions of pulsed electromagnetic field therapy plus PRE (n=17) or PRE alone (n=17). Compared to baseline assessments, both groups scored higher on post-treatment, 3-month, and 6-month follow-up scores of Knee Injury and Osteoarthritis Outcome Score (KOOS) and Numeric Pain Rating Scale (NPRS). Both groups were also able to complete the 5-times chair stand test and walking speed test faster at post-treatment timepoints compared to baseline; however, none of the discussed study outcomes were significantly different between the pulsed electromagnetic field therapy plus PRE or PRE alone groups.

de Paula Gomes et al (2020) conducted a prospective, randomized, sham-controlled trial evaluating the effects of an exercise program alone or combined with electrophysical modalities in patients with knee osteoarthritis (N=100). Patients were equally allocated into five groups (n=20): exercise, exercise plus sham, exercise plus interferential current therapy (ICT), exercise plus pulsed shortwave diathermy therapy (SDT), and exercise plus photobiomodulation. Patients received treatment three times weekly for a duration of eight weeks. A significant improvement in WOMAC function and pain scores was observed in the exercise-only group compared to all other groups, including SDT. The addition of ICT, SDT, or photobiomodulation did not result in any clinically meaningful benefits. No long-term follow-up assessments were performed after the eight-week treatment period and use of analgesics was not controlled in the study.

Magnetic Peripheral Nerve Stimulation (mPNS)

Kapural et al 2025, conducted a vendor funded randomized controlled trial to assess the safety and efficacy of mPNS in combination with conventional medical management (CMM) in patients with post-traumatic or post-surgical pain. A total of 65 patients were randomized (CMM+mPNS n=35, CMM n=30) and evaluated for one year. Patients in the CMM alone group were allowed to crossover to the treatment group at 90 days. The primary efficacy endpoint was subjects with ≥50% pain relief at day 90, without an increase in pain medication. The treatment protocol included three consecutive daily sessions in the first week, followed by a weekly session for the remainder of the month for a total of six treatments. Assessments included the visual analog scale (VAS), average change in pain score from baseline, reduction in morphine-equivalent daily dose (MEDD), initiation of new pain medication, and increases in new pain medication. Secondary outcomes included patient reported quality of life outcomes (European Quality of Life 5 Dimensions 3 Level [EQ-5D-3L]) at 365 days, the Patient Global Impression of Change (PGIC) scores and Pain Disability Index (PDI) scores. At the 90-day mark, 71% of the subjects were considered responders in the CMM +mPNS cohort vs. 13% in the CMM group ($p<0.0001$). At the end of the study, 94% of participants were responders in the CMM+mPNS cohort and 69.2% in the crossover group. Improvements were noted in the EQ-5D-3L and PGIC responder rates. Treatment -related adverse events were reported by seven participants in the CMM+mPNS, three in CMM alone, and five in crossover participants. None of the adverse events led to withdrawal and were mostly composed of mild skin irritation and short-term increases in pain around the treatment area. A primary limitation of the study was the design-it was not originally designed as a crossover study at 90 days but was added on IRB-approved protocol revision. Additionally, the authors note that a stipend was provided to the mPNS+CMM subjects to enhance retention. Prior to the stipend increase only 3/14 subjects completed day 365. The retention rate increased from 21.4%

to 76.5% after the stipend increase. Longer studies, with sound methodology are needed to determine if the use of mPNS improves the net health outcome.

PROFESSIONAL GUIDELINE(S)

In 2019, the American College of Rheumatology released guidelines for the management of osteoarthritis of the hand, hip, and knee. The guidelines do not mention pulsed electrical or electromagnetic stimulation, but they recommend against transcutaneous electrical stimulation for patients with knee and/or hip osteoarthritis.

In 2019, the Osteoarthritis Research Society International published updated evidence-based consensus guidelines for the nonsurgical management of knee, hip, and polyarticular osteoarthritis. Sixty treatment modalities were evaluated for three patient groups: knee-only, hip, and multijoint osteoarthritis. Neuromuscular electrical stimulation was considered " strongly recommended against" for all groups due to low quality evidence from trials with small sample sizes and insufficient duration of follow-up. Electromagnetic therapy was considered "strongly recommended against" for all groups due to low quality evidence and an implausible biological mechanism.

In 2021, the American Academy of Orthopaedic Surgeons published updated guidelines on the treatment of osteoarthritis of the knee. The guidelines noted that there was only one study "that examined the use of a wearable pulsed electromagnetic field device for pain management in subjects with knee osteoarthritis." The strength of recommendation was downgraded to "limited" from inconclusive since there is only this single "moderate" quality study recommending for or against the intervention.”

In 2021, the American College of Rheumatology released updated recommendations for the treatment of rheumatoid arthritis. All recommended treatments were pharmacologic. Use of electrical stimulation for treating rheumatoid arthritis was not addressed.

REGULATORY STATUS

The United States Food and Drug Administration (FDA) regulates stimulation devices as medical devices. All electrical stimulation devices including related components require FDA approval before marketing and use in the United States to ensure they are safe and effective for human use. Refer to the FDA Medical Device website. Available from: https://www.fda.gov/medical-devices [accessed 2026 March 26]

The FDA lists the most serious type of medical device recalls as well as early alert communications about corrective actions being taken by companies that the FDA believes are likely to be the most serious type of recalls. Available from: Medical Device Recalls | FDA [accessed 2026 Mar 26]

CODE(S)

- Codes may not be covered under all circumstances.
- Code list may not be all inclusive (AMA and CMS code updates may occur more frequently than policy updates).
- (E/I)=Experimental/Investigational

- (NMN)=Not medically necessary/appropriate

CPT Codes

Code	Description
0766T (E/I)	Transcutaneous magnetic stimulation by focused low-frequency electromagnetic pulse, peripheral nerve, initial treatment, with identification and marking of the treatment location, including noninvasive electroneurographic localization (nerve conduction localization), when performed; first nerve
0767T (E/I)	Transcutaneous magnetic stimulation by focused low-frequency electromagnetic pulse, peripheral nerve, initial treatment, with identification and marking of the treatment location, including noninvasive electroneurographic localization (nerve conduction localization), when performed; each additional nerve (List separately in addition to code for primary procedure)
97039 (*E/I)	Unlisted modality (specify type and time if constant attendance) (*E/I when utilized for any of the modalities addressed within this policy.)
97139	Unlisted therapeutic procedure (specify)

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HCPCS Codes

Code	Description
97139	Unlisted therapeutic procedure (specify)
E0761	Nonthermal pulsed high frequency radiowaves, high peak power electromagnetic energy treatment device
E0762 (E/I)	Transcutaneous electrical joint stimulation device system, includes all accessories
E0769 (E/I)	Electrical stimulation or electromagnetic wound treatment device, not otherwise classified
E1399	Durable medical equipment, miscellaneous

ICD10 Codes

Code	Description
All Diagnoses	

REFERENCES

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Zimmerman J, et al. Electrical stimulation for cartilage tissue engineering- a critical review from an engineer's perspective. Heliyon. 2024 Sep 23;10(2024):e38112.

SEARCH TERMS

Not Applicable

CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS)

NCD-Electrical Stimulation (ES) and Electromagnetic Therapy for the Treatment of Wounds (270.1) [accessed 2026 Apr 06]

PRODUCT DISCLAIMER

- Services are contract dependent; if a product does not cover a service, medical policy criteria do not apply.
- If a commercial product (including an Essential Plan or Child Health Plus product) covers a specific service, medical policy criteria apply to the benefit.
- If a Medicaid product covers a specific service, and there are no New York State Medicaid guidelines (eMedNY) criteria, medical policy criteria apply to the benefit.
- If a Medicare product covers a specific service, and there is no national or local Medicare coverage decision for the service, medical policy criteria apply to the benefit.

POLICY HISTORY/REVISION	
Committee Approval Dates	
01/01/27	
Date	**Summary of Changes**
01/01/27	• Original effective date