

Position Statement Policy

Neurostimulation

Policy

Neurostimulation is a low priority treatment and is not routinely funded.

This policy includes Functional Electrical Stimulation (FES) for the treatment of dropped foot in patients with neurological conditions. This policy does not apply to neurostimulation for indications commissioned by NHS England (see note below).

Spinal cord stimulation for chronic neuropathic pain taking place outside of NHSE commissioned specialist pain management services will only be funded where there is evidence that patients meet the [NICE Technology Appraisal TA159 criteria](#).

Individuals with exceptional circumstances may be considered on a case-by-case basis by the Exceptional and Individual Funding Requests Panel. The requesting clinician has to demonstrate exceptional circumstances in that there must be 'some unusual or unique factor about the patient's clinical circumstances which suggests that the presentation/effect of the condition in the patient differs significantly from that found in the general population of patients with the condition and as a result the patient is likely to gain significantly more benefit from that treatment than might generally be expected for these patients'.

It is the responsibility of referring and treating clinicians to ensure compliance with this policy. Clinicians are required to apply to the Exceptional Cases Panel for approval of funding by completing the Exceptional/IFR [Funding Request Form](#).

Note:

Some indications are funded in certain circumstances by NHS England in approved centres. Currently, these are vagus nerve stimulation for epilepsy, sacral nerve stimulation for intractable faecal incontinence and urinary incontinence, gastro-electrical stimulation for intractable gastroparesis, occipital nerve stimulation for intractable chronic migraines or medically refractory chronic cluster headache, and neuromodulation/spinal cord stimulation in highly specialist pain management services.

[NHSE service specification for pain management \(adult\)](#)

[NHS commissioning » Specialised services \(england.nhs.uk\)](#)

Background to the Condition and Treatment

Neurostimulation is the alteration of neural pathways by the application of a stimulus (electrical or chemical) to a targeted site of the body. Neurostimulation is proposed to be a safe and effective treatment for many conditions and, while it is not a treatment used in common practice, it is recommended by NICE in certain circumstances for some indications: dysmenorrhoea (see reference 1), gastroparesis (see reference 2), faecal incontinence (see reference 3), urinary incontinence (see reference 4), urinary retention (see reference 5), epilepsy (see reference 6), drop foot of central neurological origin (see reference 7), neuropathic pain (see reference 8), osteoarthritis (see reference 10), rehabilitation after traumatic injury (see reference 11), and to improve muscle strength for patients unable to exercise due to exacerbation of chronic conditions (see reference 12). NICE do not recommend the use of neurostimulation for chronic migraine or cluster headache (see reference 13), treatment-resistant depression (see reference 14), obstructive sleep apnoea (see reference 15), back pain (see reference 16), stable angina (see reference 17), or oropharyngeal dysphagia (see reference 18). For most of these indications, conventional treatment involves medication and, in some cases, surgery may be considered.

Scope

This policy covers all applications of neurostimulation that are not funded by NHS England, including (but not exclusively) transcutaneous electrical nerve stimulation (TENS) for dysmenorrhoea, osteoarthritis, back pain and stable angina; percutaneous electrical nerve stimulation (PENS) for neuropathic pain; TENS or PENS for faecal or urinary incontinence; optical nerve stimulation (ONS) for chronic migraine; transcutaneous neuromuscular electrical stimulation (NMES) for oropharyngeal dysphagia; functional electrical stimulation (FES) for neurological foot drop and spinal cord stimulation for neuropathic pain (outside of NHSE commissioned specialised pain management services).

[NICE TA159](#) (see reference 19) states that spinal cord stimulation is recommended as a possible treatment for adults with chronic pain of neuropathic origin if they:

- continue to experience chronic pain (measuring at least 50 mm on a 0–100 mm visual analogue scale) for at least 6 months despite standard treatments and have had a successful trial of spinal cord stimulation as part of an assessment by a specialist team.
- Treatment with spinal cord stimulation should only be given after the person has been assessed by a specialist team experienced in assessing and managing people receiving treatment with spinal cord stimulation.

Rationale Behind Policy Decision

The evidence for NICE recommended interventions was reviewed. There was a lack of recent trials and those published were small in size and poor quality, predominantly due to the high risk of placebo effect.

For primary dysmenorrhoea two meta-analyses of TENS showed positive results but had largely un-blinded outcome assessment and a small number of total studies (see references 20 & 21). For refractory neuropathic pain, there was evidence of favourable effects of PENS in three RCTs, but these were for different neuropathic pain indications: sciatica (see reference 22), diabetic neuropathic leg pain (see reference 23), surface hyperalgesia (see reference 24) or post-amputation pain (see reference 25, and were all small and crossover trials, making patient blinding unlikely. For foot drop, trial results vary, but although some have shown positive effects on walking speed and balance, all compare FES with no treatment/activity training or orthoses and most are unblinded and subject to bias (see reference 28-34). For urinary retention, two systematic reviews of sacral nerve stimulation reported various studies with improvements in some variables such as catheterisation frequency or residual volume compared to control, though almost all studies reported lacked a placebo control, blinding of patients, or were retrospective and therefore highly subject to bias (see reference 35 & 36). For overactive bladder, although some positive results have been reported, most studies lack a placebo control and are at high risk of bias (see reference 37).

Priority

In the absence of robust evidence from high quality research, neurostimulation is considered as low priority procedure and is not routinely funded by the ICB.

Glossary

Dysmenorrhoea:	Painful menstrual cramps of the uterus.
Functional Electrical Stimulation (FES):	Stimulation of the peripheral nerves that supply the paralysed muscle using electrodes that may be implanted or placed on the surface of the skin.
Gastroparesis:	Chronic disorder where the stomach empties more slowly than normal in the absence of any type of mechanical obstruction.
Intractable:	Difficult to treat or cure.
Neuropathic pain:	Pain that comes from problems with signals from the nerves.

Neurostimulation:	Therapeutic activation of part of the nervous system using small electrodes.
Percutaneous Electrical Nerve Stimulation (PENS):	The use of mild electrical pulses applied via needle-puncture of the skin to stimulate a nerve.
Percutaneous Tibial Nerve Stimulation (PTNS):	The use of mild electrical pulses applied via needle-puncture of the skin to stimulate the tibial nerve.
Sacral Nerve Stimulation (SNS):	The use of mild electrical pulses to stimulate the sacral nerve (applied via needle-puncture of the skin).
Transcutaneous Electrical Nerve Stimulation (TENS):	The use of mild electrical pulses applied across the intact skin to stimulate a nerve.
Transcutaneous Tibial Nerve Stimulation (TTNS):	The use of mild electrical pulses applied across the intact skin to stimulate the tibial nerve.

References

1. NICE Clinical Knowledge Summary: dysmenorrhoea <http://cks.nice.org.uk/dysmenorrhoea> 2018.
2. NICE. (2014c). Interventional Procedure Guidance 489. Gastroelectrical stimulation for gastroparesis.
3. NICE. (2007). Clinical Guideline 49. Faecal incontinence: The management of faecal incontinence in adults.
4. NICE. (2019). NICE Guideline 123. Urinary incontinence and pelvic organ prolapse in women: management.
5. NICE (2015) Interventional Procedure guidance 536: Sacral nerve stimulation for idiopathic chronic non-obstructive urinary retention.
6. NICE. (2022). NICE Guideline 217 Epilepsies in children, young people and adults.
7. NICE (2009) Interventional Procedure Guidance 278. Functional electrical stimulation for drop foot of central neurological origin.
8. NICE. (2013b). Interventional Procedure Guidance 450. Percutaneous electrical nerve stimulation for refractory neuropathic pain.
9. NICE (2014) Clinical Guideline 177. Osteoarthritis: Care and Management.
10. NICE (2022) NICE Guideline 211. Rehabilitation after Traumatic Injury.
11. NICE (2020) Interventional Procedures Guidance 677. Electrical stimulation to improve muscle strength in chronic respiratory conditions, chronic heart failure and chronic kidney disease.
12. NICE (2013). Interventional Procedure Guidance 452. Occipital nerve stimulation for intractable chronic migraine.
13. NICE (2020) Interventional Procedures Guidance 679. Implanted vagus nerve stimulation for treatment-resistant depression
14. NICE (2017) Interventional Procedures Guidance 598. Hypoglossal nerve stimulation for moderate to severe obstructive sleep apnoea
15. NICE (2016) NICE Guideline 59. Low back pain and sciatica in over 16s: assessment and management.
16. NICE (2011) Clinical Guideline 126. Management of stable angina: .
17. NICE (2018) Interventional Procedure Guidance 634. Transcutaneous neuromuscular electrical stimulation for oropharyngeal dysphagia in adults
18. NICE (2008) Technical Appraisal Guidance 159. Spinal cord stimulation for chronic pain of neuropathic or ischaemic origin.
19. Igwea S E, Tabansi-Ochuogu C S & Abaraogu U O. TENS and heat therapy for pain relief and quality of life improvement in individuals with primary dysmenorrhea: A systematic review. Complement Ther Clin Pract 24, 86–91 (2016).
20. Arik M I, Kiloatar H, Aslan B & Icelli M. The effect of TENS for pain relief in women with primary dysmenorrhea: A systematic review and meta-analysis. Explore vol. 18 108–113 Preprint at <https://doi.org/10.1016/j.explore.2020.08.005> (2022).
21. Ghoname E A, Craig W F, White P F, Ahmed H E, Hamza M A, Henderson B N, et al. (1999). Percutaneous electrical nerve stimulation for low back pain: a randomized crossover study. JAMA, 281(9), 818-823.
22. Hamza M A, White P F, Craig W F, Ghoname E S, Ahmed H E, Proctor T J, et al. (2000). Percutaneous electrical nerve stimulation: a novel analgesic therapy for diabetic neuropathic pain. Diabetes Care, 23(3), 365-370.
23. Raphael J, Raheem T, Southall J, Bennett A, Ashford R, Williams S. Randomized Double-Blind Sham-Controlled Crossover Study of Short-Term Effect of Percutaneous Electrical Nerve Stimulation in Neuropathic Pain. Pain medicine 2011; 12(10):1515-1522.

24. Gilmore C, et al. Percutaneous peripheral nerve stimulation for the treatment of chronic neuropathic postamputation pain: a multicenter, randomized, placebo-controlled trial. *Reg Anesth Pain Med* 44, 637–645 (2019).
25. Jaqueline da Cunha M, Rech K D, Salazar A P, Pagnussat A S. Functional electrical stimulation of the peroneal nerve improves post-stroke gait speed when combined with physiotherapy. A systematic review and meta-analysis. *Ann Phys Rehabil Med*. 2021 Jan;64(1):101388. doi: 10.1016/j.rehab.2020.03.012. Epub 2020 May 24. PMID: 32376404.
26. Nascimento L R, da Silva L A, Araújo Barcellos J V M, Teixeira-Salmela L F. Ankle-foot orthoses and continuous functional electrical stimulation improve walking speed after stroke: a systematic review and meta-analyses of randomized controlled trials. *Physiotherapy*. 2020 Dec;109:43-53. doi: 10.1016/j.physio.2020.08.002. Epub 2020 Aug 20. PMID: 33120054.
27. Howlett O A, Lannin N A, Ada L, McKinstry C. Functional Electrical Stimulation Improves Activity After Stroke: A Systematic Review with Meta-Analysis. *Archives of Physical Medicine and Rehabilitation* 2015;96:934-43.
28. Everaert D G, Stein R B, Abrams G M, et al. Effect of a foot-drop stimulator and ankle-foot orthosis on walking performance after stroke: a multicenter randomized controlled trial. *Neurorehabil Neural Repair*. 2013 Sep;27(7):579-91.
29. Bethoux F, Rogers H L, Nolan K J, et al. Long-Term Follow-up to a Randomized Controlled Trial Comparing Peroneal Nerve Functional Electrical Stimulation to an Ankle Foot Orthosis for Patients with Chronic Stroke. *Neurorehabil Neural Repair*. 2015 Nov-Dec;29(10):911-22.
30. Kluding P M, Dunning K, O'Dell M W, et al. Foot Drop Stimulation Versus Ankle Foot Orthosis After Stroke: 30-Week Outcomes. *Stroke* 2013; 44:1660-1669.
31. Renfrew L, Paul L, McFadyen A, et al. The clinical- and cost-effectiveness of functional electrical stimulation and ankle-foot orthoses for foot drop in Multiple Sclerosis: a multicentre randomized trial. *Clinical Rehabilitation*. July 2019; 33(7), 1150–1162
32. Jaqueline da Cunha M, Rech K D, Salazar A P, Pagnussat A S. Functional electrical stimulation of the peroneal nerve improves post-stroke gait speed when combined with physiotherapy. A systematic review and meta-analysis. *Ann Phys Rehabil Med*. 2021 Jan;64(1):101388. doi: 10.1016/j.rehab.2020.03.012. Epub 2020 May 24. PMID: 32376404.
33. Nascimento L R, da Silva L A, Araújo Barcellos J V M, Teixeira-Salmela L F. Ankle-foot orthoses and continuous functional electrical stimulation improve walking speed after stroke: a systematic review and meta-analyses of randomized controlled trials. *Physiotherapy*. 2020 Dec;109:43-53. doi: 10.1016/j.physio.2020.08.002. Epub 2020 Aug 20. PMID: 33120054.
34. Gross C, Habli M, Lindsell C, et al. (2010). Sacral neuromodulation for nonobstructive urinary retention: a meta-analysis. *Female Pelvic Medicine & Reconstructive Surgery* 16: 249–53.
35. Ho F C S, He C, Yao H H, O'Connell H E, Gani J. Efficacy of sacral neuromodulation and percutaneous tibial nerve stimulation in the treatment of chronic nonobstructive urinary retention: A systematic review. *Neurourol Urodyn*. 2021 Jun;40(5):1078-1088. doi: 10.1002/nau.24694. Epub 2021 May 11. PMID: 33973670.
36. Wang M, Jian Z, Ma Y, Jin X, Li H, Wang K. Percutaneous tibial nerve stimulation for overactive bladder syndrome: a systematic review and meta-analysis. *Int Urogynecol J*. 2020 Dec;31(12):2457-2471. doi: 10.1007/s00192-020-04429-8. Epub 2020 Jul 17. PMID: 32681345.