NICE National Institute for Health and Care Excellence

NICE guidance

Electrical stimulation to improve muscle strength in chronic respiratory conditions, chronic heart failure and chronic kidney disease

HealthTech guidance
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www.nice.org.uk/guidance/htg549

Your responsibility

This guidance represents the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take this guidance fully into account, and specifically any special arrangements relating to the introduction of new interventional procedures. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the Yellow Card Scheme.

Commissioners and/or providers have a responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties. Providers should ensure that governance structures are in place to review, authorise and monitor the introduction of new devices and procedures.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Contents

This guidance replaces IPG677.

1 Recommendations

1.1 Evidence on the safety of electrical stimulation to improve muscle strength in chronic respiratory conditions, chronic heart failure and chronic kidney disease shows no major safety concerns.

- For people who are having an acute exacerbation of their chronic condition and are unable to exercise, evidence of efficacy is adequate to support the use of this procedure provided that standard arrangements are in place for clinical governance, consent and audit. Find out what standard arrangements mean on the NICE website.
- For people who are able to exercise, evidence on efficacy is inadequate in quality. Therefore, this procedure should only be used in the context of research. Find out what only in research means on the NICE website.

1.2 Further research should include long term, suitably powered and appropriately controlled randomised trials. These should report details of patient selection, and type and duration of treatment. Outcomes should include quality of life, social functioning and physiological measures.

2 The condition, current treatments and procedure

The condition

2.1 Chronic respiratory conditions, chronic heart failure and chronic kidney disease can cause impaired muscle function and weakness.

Current treatments

2.2 Rehabilitation is described in NICE's guidelines on rehabilitation after critical illness, chronic obstructive pulmonary disease and chronic heart failure. Management for muscle weakness or dysfunction caused by chronic respiratory conditions, chronic heart failure or chronic kidney disease includes lifestyle change, medication (including oxygen therapy), rehabilitation (such as pulmonary rehabilitation or cardiac rehabilitation) and treating the underlying conditions.

The procedure

2.3 Electrical stimulation produces muscle contractions that aim to mimic exercise training. Small electrical impulses are applied to nerves supplying groups of muscles typically in either the arms or legs, using self-adhesive electrodes applied to the skin and connected to an electrical stimulator. This causes the muscles supplied by the nerve to contract and relax. A typical programme consists of 30 to 60 minutes of stimulation.

3 Committee considerations

The evidence

3.1 NICE did a rapid review of the published literature on the efficacy and safety of this procedure. This comprised a comprehensive literature search and detailed review of the evidence from 12 sources, which was discussed by the committee. The evidence included 6 systematic reviews and/or meta-analyses, and 6 randomised controlled trials. It is presented in table 2 of the overview. Other relevant literature is in the appendix of the overview.

3.2 The professional experts and the committee considered the key efficacy outcomes to be: quality of life, mood, muscle strength and function, and social functioning.

3.3 The professional experts and the committee considered the key safety outcomes to be: muscle pain or discomfort, and skin reactions to electrodes.

3.4 Patient commentary was sought but none was received.

Committee comments

3.5 The committee noted that the procedure may be contraindicated in patients who have an electronic implant (such as a cardiac pacemaker or defibrillator).

3.6 The committee noted that there was only limited evidence that the procedure produced an additional benefit in patients who had successfully undertaken a physical rehabilitation programme.

3.7 The committee noted that electrical stimulation may be used in conjunction with physical exercise, but it should not be used as an alternative to a formal exercise programme if this is possible.

Update information

Minor changes since publication

January 2026: Interventional procedures guidance 677 has been migrated to HealthTech guidance 549. The recommendations and accompanying content remain unchanged.

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Endorsing organisation

This guidance has been endorsed by Healthcare Improvement Scotland.