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# Differential Target Multiplexed Spinal Cord Stimulation: A UK Cost-Effectiveness Analysis

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## Introduction

Chronic low back pain (CLBP) is the leading cause of years lived with disability worldwide and affects > 7.5% of the global population.

Spinal cord stimulation (SCS) therapy is a long-established treatment for CLBP, providing significant benefits and treatment satisfaction compared to conventional medical management (CMM).

Differential target multiplexed (DTM)-SCS is a recent development in therapy, which uses multiplexed electrical pulses to target the modulation of glial cells and neurons.

UK NICE cost-effectiveness analysis is out of date and does not consider this newer form of therapy. This work therefore expands the NICE model by assessing the cost-effectiveness of DTM in comparison to CMM and conventional (C)-SCS.

## Materials and Methods

The model compared three treatment options, DTM-SCS, C-SCS and CMM.

Costs were based upon UK NHS data, and model inputs derived from published literature and deidentified sources. A single SCS system was modelled for both C-SCS and DTM-SCS cohorts, with SCS groups continuing to receive CMM.

A 12-month decision tree phase followed by a Markov model to 15-year follow-up was used, with three-month cycles.

Optimal pain relief was defined as  $\geq 50\%$  improvement in VAS back pain. Costs and quality-adjusted life-years (QALYs) were calculated over the 15-year period, using deterministic and one-way sensitivity analyses, and probabilistic sensitivity analyses performed to explore the effect of the joint uncertainty in all model inputs.

The full-text article of this project has been accepted and is in print in the *Neuromodulation: Technology at the Neural Interface*.

## Results/Case Report

After the discounted mean costs, QALYs, and life-years associated with each treatment group were calculated over a 15-year time horizon, the ICER for each pairwise comparison was £10,111 per QALY gained for C-SCS vs CMM (incremental net benefit [INB] = £8551); £6101 per QALY for DTM-SCS vs CMM (INB = £21,281); and £897 per QALY for DTM-SCS vs C-SCS (INB = £12,730).

## Discussion

The results demonstrate that, over a 15-year follow-up period, DTM-SCS is cost-effective for treating patients with LBP from both payer and societal perspectives. While both DTM-SCS and C-SCS are cost-effective compared to CMM in the long term, DTM-SCS achieved a lower ICER than C-SCS. These findings advocate for the broader adoption of DTM-SCS in the UK healthcare system for managing CLBP.

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## Disclosures

Yes

## Tables / Images



