Background & Objectives

Spinal Cord Stimulation (SCS) is a treatment for chronic intractable pain powered by an implantable pulse generator with a rechargeable or non-rechargeable (NR) battery. SCS is performed in two stages (a trialling phase, followed by permanent device implantation); however, this necessitates two hospitalizations and may increase infection risk. This analysis explores the cost impact of both improvements in battery longevity and the adoption of a 1-step (direct-to-implant) SCS approach within the Italian National Health System (NHS).

Methods

Since 2019, three leading NR SCS devices have been launched: Device A (2019); Device B (2020); Device C (2021). Battery longevity of the newest Device C was estimated at comparable stimulation settings for Devices A and B (per product manuals): 4.5 years for Device A (vs. 8.31 for Device C) and 5.1 years for Device B (vs. 9.27 for Device C).

Economic Model

A Markov model (Figure 1) simulated individual patients across two scenarios: Device A vs. Device C and Device B vs. Device C (both with a direct-to-implant approach). Costs considered were the initial device implantation procedure, device replacements and serious adverse event management. Italian DRG tariffs were applied for costs and a 15-year time horizon used.

Results

Over 15 years, using a direct-to-implant approach, undiscounted total costs for Device A vs. Device C were €29,666 and €25,380, respectively; and for Device B vs. Device C were €27,895 and €25,141, respectively. Compared to Devices A and B, Device C offered savings of €4,286 and €2,754, respectively, with the savings due to fewer expected device replacements afforded by increased battery longevity.

Conclusions

Extended SCS battery longevity can translate into tangible cost savings for payers. Furthermore, a direct-to-implant approach for SCS supports NHS cost efficiencies and can offer the additional benefits of optimizing OR time and having only one recovery period for the patient.

References