Rechargeable deep brain stimulation implantable pulse generator

The Activa PC implantable pulse generator (IPG) demonstrates a significantly reduced battery life of 2.1 years, with a median battery life of 4.5 years in comparison to 6.6 years in the Kinetra IPG. Future technology developments should therefore be focused on improving the battery life of the newer IPG systems [1)].

Nonrechargeable deep brain stimulation implantable pulse generators (IPGs) for movement disorders require surgical replacement every few years due to battery depletion. Rechargeable IPGs reduce frequency of replacement surgeries and inherent risks of complications but require frequent recharging [2)].

Rechargeable deep brain stimulation implantable pulse generator for movement disorders are well received by patients as initial therapy and after conversion. Mild reduction in stimulation parameters might be allowed after conversion to RC IPG [3)].

However, there is now a choice between fixed-life and rechargeable batteries, with each having their own advantages and disadvantages.

Most patients in a adult cohort with movement disorders chose the fixed-life battery. The better lifestyle associated with a fixed-life battery is a major factor influencing their choice. Rechargeable batteries may be more acceptable if the recharging process is improved, more convenient, and discreet [4)].

Mitchell et al., evaluated patient experience with rechargeable IPGs and define predictive characteristics for higher satisfaction.

They contacted all patients implanted with rechargeable IPGs at a single center in a survey-based study. They analyzed patient satisfaction with respect to age, diagnosis, target, charging duration, and body mass index. They tabulated hardware-related adverse events.

Dystonia patients had significantly higher satisfaction than Parkinson's disease patients in recharging, display, programmer, and training domains. Common positive responses were “fewer surgeries” and “small size.” Common negative responses were “difficulty finding the right position to recharge” and

“need to recharge every day.” Hardware-related adverse events occurred in 21 of 59 participants.

Patient experience with rechargeable IPGs was largely positive; however, frustrations with recharging and adverse events were common. Dystonia diagnosis was most predictive of high satisfaction across multiple categories, potentially related to expected long disease duration with need for numerous IPG replacements [5].

Hitti et al., implanted rechargeable stimulators in 206 patients undergoing DBS surgery, and demonstrated the cost-effectiveness and high patient satisfaction associated with this procedure [6].

References

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