Rechargeable implantable pulse generator

- Long-term infective complications of deep brain stimulation in Parkinson's disease: A 22-year follow-up
- Meta-analysis and review of rechargeable implantable pulse generators for spinal cord stimulation and deep brain stimulation
- Movement disorder Deep brain stimulation Hybridization: Patient and caregiver outcomes
- Corrigendum: Fixed-life or rechargeable batteries for deep brain stimulation: preference and satisfaction among patients with hyperkinetic movement disorders
- Corrigendum: Fixed-life or rechargeable battery for deep brain stimulation: preference and satisfaction in Chinese patients with Parkinson's disease
- Deep Brain Stimulation for the Management of Refractory Neurological Disorders: A Comprehensive Review
- Incidence of Infections, Explantations, and Displacements/Mechanical Complications of Spinal Cord Stimulation During the Past Eight Years
- Complications of Spinal Cord Stimulators-A Comprehensive Review Article

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Rechargeable implantable pulse generators (r-IPGs) for deep brain stimulation (DBS) promise longer battery life and fewer replacement surgeries versus non-rechargeable systems.

Patients with psychiatric disorders rated the recharging process as “easy”, but with a significantly higher charge burden and usage-related complication rates compared to published data on movement disorder DBS patients [1].

They have been available for spinal cord stimulation (SCS) claiming to offer a longer service life but demanding continuous monitoring and regular recharging by the patients. The aim of a study (DRKS00021281; Apr 7th, 2020) was to assess the convenience, safety, and acceptance of r-IPGs and their effect on patient lives under long-term therapy. Standardized questionnaires were sent to all chronic pain patients with an r-IPG at the time of trial. The primary endpoint was the overall convenience of the charging process on an ordinal scale from “very hard” (1 point) to “very easy” (5 points). Secondary endpoints were charge burden (min/week), rates of user confidence, and complications (failed recharges, interruptions of therapy). Endpoints were analyzed for several subgroups. Data sets n = 40 (42% return rate) were eligible for analysis. Patient age was 57.2 ± 12.6 (mean ± standard deviation) years with the r-IPG being implanted for 52.1 ± 32.6 months. The overall convenience of recharging was evaluated as “easy” (4 points). The charge burden was 112.7 ± 139 min/week. 92% of the patients felt confident recharging the neurostimulator. 37.5% of patients reported failed recharges. 28.9% of patients experienced unintended interruptions of stimulation. Subgroup analysis only showed a significant impact on overall convenience for different models of stimulators ($p < 0.05$). Overall, SCS patients feel confident handling an r-IPG at high rates of convenience and acceptable effort despite high rates of usage-related complications. Further technical improvements for r-IPGs are needed [2].

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Jakobs M, Hajiabadi MM, Aguirre-Padilla DH, Giaccobe P, Unterberg AW, Lozano AM. Recharge PSYCH: A Study on Rechargeable Implantable Pulse Generators in Deep Brain Stimulation for Psychiatric Disorders. World Neurosurg. 2022 Nov 9:S1878-8750(22)01559-5. doi: 10.1016/j.wneu.2022.11.017. Epub ahead of print. PMID: 36368453.

2)

Hajiabadi MM, Vicheva P, Unterberg A, Ahmadi R, Jakobs M. A single-center, open-label trial on convenience and complications of rechargeable implantable pulse generators for spinal cord stimulation: The Recharge Pain Trial. Neurosurg Rev. 2023 Jan 14;46(1):36. doi: 10.1007/s10143-022-01940-y. PMID: 36640226.