

# High-frequency spinal cord stimulation provides better results in chronic back and leg pain

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For patients with severe, chronic back and leg pain, a new high-frequency spinal cord stimulation (SCS) technique provides superior clinical outcomes, compared to conventional low-frequency SCS, reports a clinical trial in the November issue of *Neurosurgery*, official journal of the Congress of Neurological Surgeons.

The new 'HF10' technique offers lasting reductions in back and leg pain after other treatments have failed, according to the report by Dr. Leonardo Kapural of the Center for Clinical Research and Carolinas Pain Institute, Winston-Salem, N.C., and colleagues. They believe that HF10 therapy could have a major impact on the treatment of chronic back and leg pain, and possibly other conditions as well.

## With HF10, Lasting Reduction in Pain Scores at Two Years' Follow-up

The study included 171 patients with moderate to severe back and leg pain that persisted despite other treatments. Treated at 11 US comprehensive pain centers, the patients had chronic pain that had been present for an average of 14 years. Nearly 90 percent had had previous back surgery; a similar proportion were taking opioid pain medications.

After a trial period, patients were randomly assigned to one of two SCS techniques, with mild electrical stimulation applied to targeted spinal

nerves. One group was treated using HF10, with high-frequency stimulation (10 kilohertz) applied for very short periods. The other group received traditional SCS, with lower-frequency stimulation applied for relatively longer periods.

As previously reported, HF10 provided superior pain relief. At three months, scores for back and leg pain decreased by at least half in more than 80 percent of patients receiving HF10. By comparison, conventional SCS achieved similar responses in back pain for 44 percent of patients and in leg pain for 55 percent.

At two years' follow-up, the HF10 group still had higher response rates: 76 versus 49 percent for back pain and 73 versus 49 percent for leg pain. On a 0-to-10 rating scale, average back [pain score](#) decreased by 5 points with HF10 versus about 3 points for traditional SCS. About 60 percent of patients receiving HF10 were "very satisfied" with their treatment, compared to 40 percent with conventional SCS.

Although SCS is not a new treatment, it provides more consistent results for leg pain than back pain, and relies on producing overlapping areas of numbness (paresthesia) to mask pain. By comparison, HF10 seems to provide greater relief of back pain without inducing areas of numbness. The new study is among the few to directly compare different approaches to SCS in patients with back and leg pain.

Within its limitations, the pragmatic clinical trial supports the superiority of HF10 over conventional SCS for patients with chronic, severe back and [leg pain](#). Extending follow-up to two years "provides physicians, patients, and payers with rigorous evidence demonstrating the durability of SCS in treating chronic pain," Dr. Kapural and coauthors write. They note that the results are "particularly impressive" given the patients' long history of pain and lack of response to other treatments, including back surgery.

Further research will determine whether HF-10 is useful for other chronic pain problems as well, such as arm and [neck pain](#). Dr. Kapural and colleagues conclude: "The superior and durable results demonstrated in this study are anticipated to lead to improved long-term cost effectiveness and payer acceptance, making this therapy broadly available to [patients](#) suffering from [chronic pain](#)."

**More information:** Leonardo Kapural et al. Comparison of 10-kHz High-Frequency and Traditional Low-Frequency Spinal Cord Stimulation for the Treatment of Chronic Back and Leg Pain, *Neurosurgery* (2016). [DOI: 10.1227/NEU.0000000000001418](https://doi.org/10.1227/NEU.0000000000001418)

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