

Health-related quality of life phenotypes among chronic pain patients receiving spinal cord stimulation

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Introduction

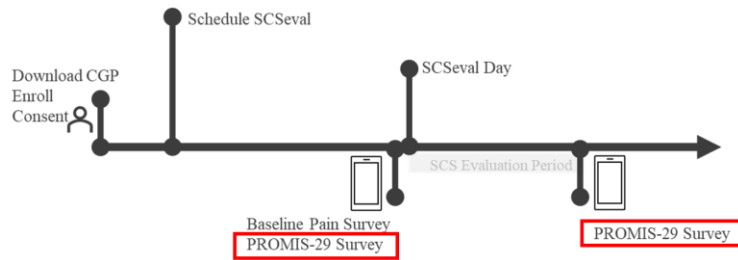
- Patients with chronic pain frequently experience symptoms that impair their mental, social, and physical well-being.
- Patient chronic-pain experiences are complex, personal and unique. Relevant quantification of them is captured in PROMIS-29 survey.
- Chronic pain patients become eligible for a permanent Spinal Cord Stimulator implant after demonstration of pain relief with a temporary SCS (SCSeval)

Objectives

This study aims to examine the effects of temporary spinal cord stimulation therapy on pain and other aspects of patients' health-related quality of life (HRQoL).

Materials & Methods

- Retrospective analysis of (n=1449) patients with PROMIS-29 surveys collected through CareGuidePro™ digital health platform

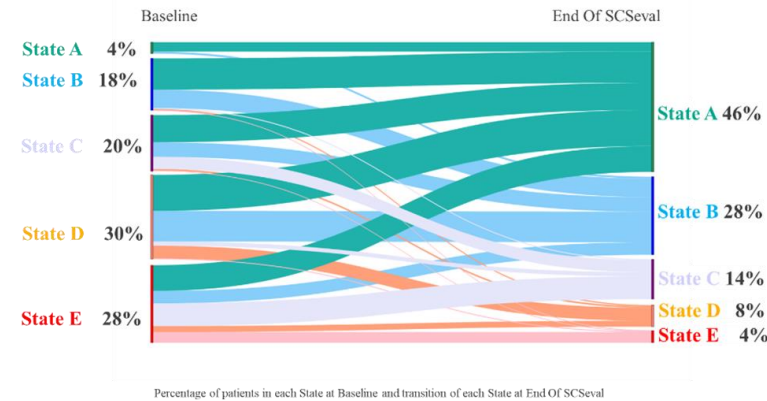


- Characterizing Chronic Pain: Unsupervised K-means clustering
- Trends and Comparison:
 1. Changes in patient clusters from baseline to SCSeval
 2. Relative improvements in specific domains stratified by clusters/states at the beginning of the SCSeval
 3. Compare clusters to clinical benchmarks: PROMIS-29 based T-scores⁴⁻⁵ and PROPr6 health utility scores

Results

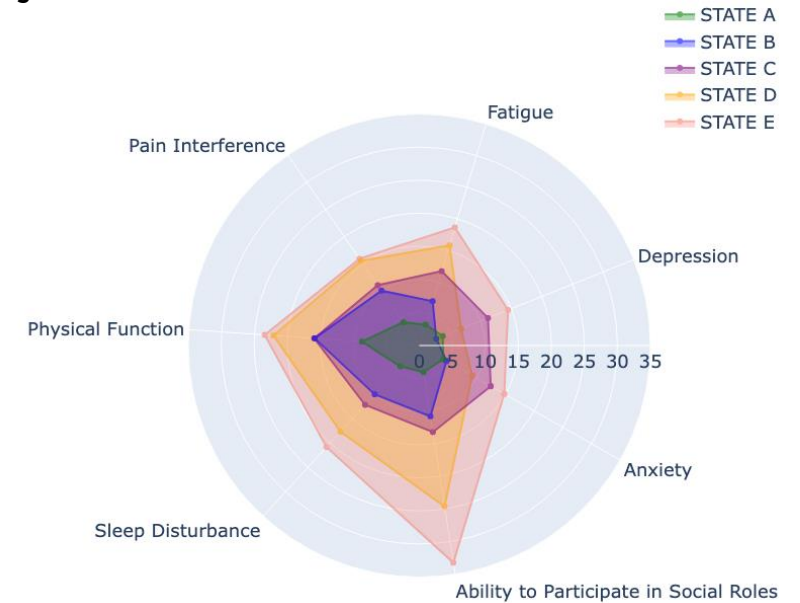
- Five distinct patient subgroups based on their PROMIS-29 responses, which ranged from the least severe (State A) to the most severe (State E) chronic pain and corresponded to clinical benchmarks.

Figure 1. Changes in patient clusters from baseline to end of SCSeval



- Sankey diagram illustrates the state transitions that demonstrate patient's improvement after SCSeval ($p < 0.001$).
- Pain and HRQOL improved for majority of patients after SCSeval, with improvement occurring 31.2 times more frequently than deterioration.
- Time-agnostic clustering strategy allowed us to evaluate how patients' pain and HRQOL changed over time in response to SCSeval exposure (e.g., 28% of sample in worst pain/HRQOL State E at BL; 4% of sample in worst pain/HRQOL State E at end of SCSeval).

Figure 2. Relative improvements in specific domains stratified by clusters/states at the beginning of the SCSeval



T-score metric for each PROMIS-29 domain normalized as $(\text{End Of SCSeval} - \text{BL}) * 100 / \text{BL}$

Conclusions

- State improvement may be used as part of the success criterion for SCS therapy
- Chronic pain has complex and multi-faceted effects on the lives of patients and pain relief is a personal experience. Our research emphasizes the significance of understanding individual chronic pain phenotypes and employing validated techniques to better manage and understand their condition.

References

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