Title:

Adoption of a Novel Digital Health Tool for Adverse Event Monitoring in Patients Receiving Spinal Cord Stimulator Implantation

Background Context:

Spina Cord Stimulator (SCS) Implantation is generally thought of as a safe procedure however complication rates have been reported to range from 30-50%. Information exchange between patients and providers is often fragmented and a lack of efficient patient-provider communication in the post-operative period can hinder the timely identification and intervention of patient health incidents.

Objective:

We conducted a pilot study to explore the use of a novel, automated SMS-based digital health tool for adverse event (AE) monitoring in patients receiving SCS Implantation.

Study Design:

Prospective Pilot Study.

Patient Sample:

A total of 13 patients who underwent SCS implantation by a single surgeon from May 2021 to October 2021.

Outcome Measures:

We investigated the usability and feasibility of implementing the digital health tool.

Methods:

Patients were prospectively enrolled in the tool's administrative web portal by clinical staff. Patients received automated questionnaires assessing AE incidence via a HIPAA-compliant SMS link at 24 hours, 30 hours, 36 hours, 42 hours, 48 hours, 54 hours, 60 hours, 66 hours, and 72 hours post-SCS Implantation surgery. Once patients clicked on the SMS link, they were led to a secure web browser allowing them to complete the questionnaire. No app download or patient login was required.

The digital health tool's Care Alert platform enabled clinicians to be alerted in real-time of patient issues. Patient responses that indicated an issue/adverse event (alerts) were immediately sent to the surgeon and care team via automated email and HIPAA-compliant text-message. Alerts were also automatically logged in the tool's web portal.

Results:

The digital tool was able to capture AE incidence data on 77% (n=10) of patients receiving SCS Implantation surgery. Mean patient age was 55 years. Fifty questionnaires were completed and 255 questions were answered. The surgeon and care team received a total of 12 alert notifications over all timepoints. Six patients developed at least one AE within 72 hours post-SCS Implantation. The following

AEs were captured: new weakness (n=4), difficulty urinating or passing stool (n=4), new numbness (n=3) and abdominal pain (n=1).

The surgeon and care team received real-time notification of these adverse events and were able to immediately follow-up with patients. None of the patients required re-admission. Minimal time effort was required from clinical staff after initial patient enrollment. Results from an internal survey indicated that (1) clinicians and patients thought the tool was intuitive and easy to use and (2) clinicians found the tool to be helpful and efficient in identifying patient health issues.

Conclusions:

Use of the SMS-based digital health tool allowed clinicians to be notified in real-time of patient issues and adverse events post-SCS Implantation surgery. Patients were able to remotely provide crucial health information and the care team was able to immediately follow-up with patients as appropriate. The tool facilitated the timely and effective monitoring of adverse events, and its implementation was found to be beneficial to both clinicians and patients. We believe use of such a tool can (1) help with the early detection of patient health incidents and the mitigation of worsening patient morbidity and avoidable readmissions and (2) streamline information exchange between patients and providers.