Robot allows 'remote presence' to program brain and spine

EurekAlert!

Technology can help increase access to experts as use of neuromodulation grows, suggests Neurosurgery

Philadelphia, Pa. (January 16, 2013) – With the rapidly expanding use of brain and spinal cord stimulation therapy (neuromodulation), new "remote presence" technologies may help to meet the demand for experts to perform stimulator programming, reports a study in the January issue of Neurosurgery, official journal of the Congress of Neurological Surgeons. The journal is published by Lippincott Williams & Wilkins, a part of Wolters Kluwer Health.

The preliminary study by Dr. Ivar Mendez of Queen Elizabeth II Health Sciences Centre in Halifax, Nova Scotia, Canada, supports the feasibility and safety of using a remote presence robot—called the "RP-7"—to increase access to specialists qualified to program the brain and spine stimulators used in neuromodulation.

Robot Lets Experts Guide Nurses in Programming Stimulators

Dr. Mendez and his group developed the RP-7 as a way of allowing experts to "telementor" nonexpert nurses in programming stimulator devices. Already widely used for Parkinson's disease and severe chronic pain, neuromodulation is being explored for use in other conditions, such as epilepsy, severe depression, and obsessive-compulsive disorder.

In this form of therapy, a small electrode is surgically placed in a precise location in the brain or spine. A mild electrical current is delivered to stimulate that area, with the goal of interrupting abnormal activity. As more patients undergo brain and spine stimulation therapy, there's a growing demand for experts to program the stimulators that generate the electrical current.

The RP-7 is a mobile, battery-powered robot that can be controlled using a laptop computer. It is equipped with digital cameras and microphones, allowing the expert, nurse, and patient to communicate. The robot's "head" consists of a flat-screen monitor that displays the face of the expert operator.

The RP-7 also has an "arm" equipped with a touch-screen programmer, which the nurse can use to program the stimulator. The expert can "telestrate" to indicate to the nurse the correct buttons to push on the programming device.

Access to Specialists in the Next Room—or Miles Away

In the preliminary study, patients with neuromodulation devices were randomly

assigned to conventional programming, with the expert in the room; or remote programming, with the expert using the RP-7 to guide a nurse in programming the stimulator. For the study, the expert operators were simply in another room of the same building. However, since the RP-7 operates over a conventional wireless connection, the expert can be anyplace that has Internet access.

On analysis of 20 patients (10 in each group), there was no significant difference in the accuracy or clinical outcomes of remote-presence versus conventional programming. No adverse events occurred with either type of session.

The remote-presence sessions took a little more time: 33 versus 26 minutes, on average. Patients, experts, and nonexpert nurses all gave high satisfaction scores for the programming experience.

"This study demonstrated that remote presence can be used for point-of-care programming of neuromodulation devices," Dr. Mendez and coauthors write. The study provides "proof of principle" that the RP-7 or similar devices can help to meet the need for experts needed to serve the rapidly expanding number of patients with neuromodulation therapies.

The researchers have also started a pilot study using a new mobile device, called the RP-Xpress. About the size of a small suitcase, the RP-Xpress is being used to perform long-distance home visits for patients living hundreds of miles away, using existing local cell phone networks. Dr. Mendez and colleagues conclude, "We envision a time, in the near future, when patients with implanted neuromodulation devices will have real-time access to an expert clinician from the comfort of their own home."

Source: http://www.eurekalert.org/pub_releases/2013-01/wkh-ra011613.php [1]

Source URL (retrieved on *04/25/2015 - 11:57pm*):
http://www.ecnmag.com/news/2013/01/robot-allows-remote-presence-program-brain-and-spine

Links:
[1] http://www.eurekalert.org/pub_releases/2013-01/wkh-ra011613.php