UNIVERSITY OF PITTSBURGH
innovation
INSTITUTE

Manual Wheelchair – Virtual Coach

ID: 04400

Innovators: Dr. Rory Cooper, Dr. Garrett Grindle, Rosemarie Cooper, S. Andrea Sundaram, Josh Brown, Matt Landis

All wheelchair users are at risk for developing pressure ulcers, with that risk being as high as 85% in some subpopulations. Pressure ulcers harm overall health, productivity, independence, and overall quality of life. Cost of treating a pressure ulcer can reach $50,000, even when not involving a hospital stay.

Doing effective pressure relief maneuvers reduce the likelihood of developing pressure ulcers. The Manual Wheelchair Virtual Coach (MW-VC) teaches users how and when to do effective pressure relief, provides reminders, and tracks progress over time to instill the behaviors that prevent pressure ulcers. Unlike competitors, the MW-VC is context aware and physically robust to fit into users' active lifestyles.

Technology Description

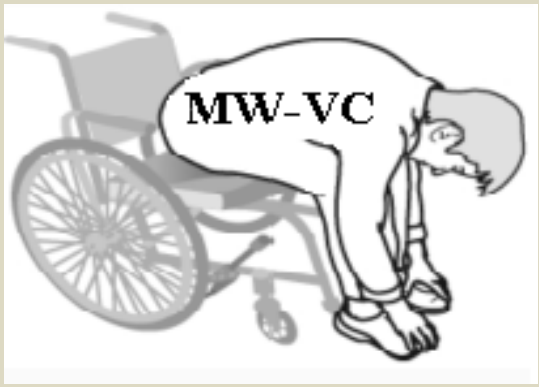
The MW-VC consists of sensors mounted to the wheelchair's seat pan, artificial intelligence algorithms to interpret the sensor measurements, and a smartphone app to provide reminders and coach the user to make each pressure relief effective. Our context aware system provides reminders only when they are necessary — making the system less intrusive and boosting compliance. Being built into the rigid structures of the chair, our hardware is less susceptible to wear and tear than the pressure mats in competitive designs. This also makes the MW-VC compatible with whatever cushion the wheelchair user prefers.

Advantages

- Measures effectiveness of pressure relief
- Coaches technique
- Doesn't give unnecessary reminders
- Works with any type of cushion
- Durable design

Applications

- Acute rehab
- Assisted-living environments
- In-home/in community



Stage of Development

The MW-VC's algorithms were built on data collected from 40 manual wheelchair users on an initial prototype. The team has conducted focus groups with clinicians and end-users, as well as customer interviews, to improve the design.

Based on feedback from the focus groups, we are currently refining the prototype, and beginning in-home testing. We will conduct preclinical trial with 10 users this year, and plan to expand to a larger group for clinical trials next year.

IP Status

Provisional Patent Application filed July 2018

Notable Mentions

Pitt Innovation Challenge Finalist 2017 ($30,000)
First Gear Pitch Competition Winner 2016 ($10,000)

University of Pittsburgh
Innovation Institute
200 Gardner Steel Conference Center
Thackeray & O'Hara Streets
Pittsburgh, PA 15260

George Coulston, PhD, MBA
Technology Licensing Manager
412-648-2236
gcoulston@innovation.pitt.edu