Exercise Band Monitoring

Legacy Project

Many patients in West Virginia are not getting sufficient exercise, even mild amounts of exercise. They are either suffering from congestive health failure, diabetes or COPD or a combination of those. Even mild exercise could dramatically improve their condition.

Participating in strength-training exercises is possible, even for severe congestive heart failure patients, according to the American College of Sports Medicine. Using resistance bands, controlled movements, maintaining a regular breathing pattern and avoiding straining are recommended.

In some cases a specific exercise program is developed by a patient's doctor. For example, exercise guidelines for patients with congestive heart failure include 20 to 30 minutes of exercise performed three to five times each week. The American Heart Association recommends gradually warming up and cooling down to avoid strain on your heart. Resistance should be increase as strength increases.

In the American Appalachian Mountains, coal mining has left many poor residents with COPD, CHF and diabetes. They are recommended to do resistance training to help them recover from their worst episodes. This project is mostly focused on Welch and Williamson, West Virginia. Welch is in McDowell County, one of the poorest counties in the USA. Williamson is a town of about 3000 inhabitants deep in the beautiful Appalachian Mountains of West Virginia, USA. These rugged inhabitants have been devastated by natural disasters and economic hardship. Only recently has the city been protected by a floodwall in response to deadly flooding along the Tug Fork River in 1977 and again in 1984. The local economy is largely fueled by coal mining, an industry in rapid decline.

While patients are directed to do resistance training exercises, many patients are not following their doctor's recommendation. In fact, there is little data on their compliance (are they using them). It would be helpful to know answers to questions such as the frequency of sessions, the number of stretches per session. In this way, motivational interventions, such as community health workers visits to the home could be added or modified to increase compliance.

A previous team has tested and designed a switch, box, processor combination that can register a stretch and store the data. However, it occasionally slips down the band and the power management and real time clock are not functioning (to time stamp the data). Also, there is no computer program to download the data.

The goal of this project is to finish the board (reduce the slipping and finalize the real-time clock and power management) and to write a computer program that can download the data from the board and store it as a CSV and/or a report of exercise.

Contact

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