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Comparison of therapeutic exercise accuracy during completion of a home exercise program using the Exercise Tutor versus a written home exercise program

College of Sciences and Health Professions

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Abstract

Exercise is powerful in rehabilitation and prevention of disability; however, patient adherence to home exercises is difficult, learning new movements requires a great deal of practice, and incorrectly performed exercises are ineffective or even dangerous. We have developed a system comprised of a Kinect device with wearable inertial sensors to capture, record, and process the exerciser's movement while concurrently providing targeted feedback to guide correct exercise completion. This pilot study allowed us to perform initial testing of this system, specifically, the effectiveness of this system in improving exercise accuracy, with and without the addition of inertial sensors to the Kinect camera feedback, as compared to a traditional written home exercise program. Twenty-four participants (18-48 years old, 14 female) completed one of three training types: a written exercise program, Kinect feedback only, or combined inertial sensor and Kinect feedback. All subjects completed a pre-test, three training sessions, and a post-test with the assigned feedback type, with movement accuracy as the outcome. These data are in analysis; therefore, previous data from the pilot for this project are presented here. Initial analysis indicates that kinect and inertial sensor feedback are better for different movement types, and are superior to a written program.