Non-Invasive Electronic Wireless Knee Biomechanical and Physiology Monitoring for Post-Operative Rehabilitation

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The SmartSleeve is a non-invasive wearable device that can provide real-time physiological and clinical measurements with wireless embedded sensing technology will improve the rehabilitation and physical therapy measured in: a) Reduced duration of rehabilitation. b) Absence or substantial reduction in the incidence of impaired physiologic function (rehabilitation goal: full range of motion, lack of pain, strength and stability substantially equivalent to pre injury state) of the joint. c) Reduction in the risk of unattended medical complications occurring during rehabilitation regimens and outside clinic visit time. embedded microelectronics. In real-time the device collects data and wirelessly transmits physiologic and medical data to a variety of user interfaces including smartphones, tablets, or computers via radio telemetry or direct download onto a protected server. Real-time and historical data are presented in a friendly, easy to understand interface on the patient's smartphone that includes reminders and encouragements based on customized rehabilitation regimens loaded by the medical team. Using unique calibration and signal processing methods, the SmartSleeve is able to accurately able to differentiate between various angles and movements of the knee. A biomechanical analysis shows that gait data collected is reproducible and identical to that of 3D motion capture technology. Temperature data is accurate enough to detect temperature changes associated with rehabilitation complications.

Awards Won:

Fourth Award of $500