Wearable Device to Objectively Measure Pain and Stress

Background: Pain is a person’s perception of a stimulus and is therefore a subjective measure. Measures such as the Visual Analog Scale and the FACES Pain Scale are traditionally used but are limited in ability to detect changes, especially in a clinical setting. Currently, there is no objective and quantitative measure of pain that can be used clinically.

Technology Description: KnowPain is a mobile, hand-mounted device that can objectively measure pain and stress though the galvanic skin response. It has been shown that when pain (stress) increases, sympathetic nervous system activity increases, and this increase is reflected in the galvanic skin response. We have integrated secondary information such as humidity, temperature, and motion to eliminate confounding variables from the pain response. Our real-time measures allow for monitoring of pain as a vital sign.

Stage of Development: A proof-of-concept prototype has been developed that demonstrates consistency with subject-reported pain during and after a cold pressor test. An iOS App is in development to analyze and visualize real-time information. Next steps are to integrate secondary information and to test the device in a larger sample of subjects.

Patent: US2016007878A1

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WU Reference Number: 014115