

CONTINUOUS MONITORING OF THE GALVANIC SKIN RESPONSE

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Galvanic Skin Response (GSR) is an objective measurement of the electrical conductance of the skin. GSR is tightly correlated with peripheral sweat rate, which in turn is associated with many clinical conditions. These conditions include, but are not limited to, menopausal "hot flashes", diabetic hypoglycemic and hyperglycemic episodes, and various cancers. The objective quantification of GSR can be a valuable clinical tool in evaluating the effectiveness of clinical interventions for these and other conditions. Current methods of monitoring GSR are not well suited to implementation outside of the clinical setting. The goal of this research is to develop a reliable portable device for real-time ambulatory monitoring of GSR. In order to get accurate and consistent readings, electrodes must be attached to the patient with a lasting and non-irritating electrically conductive gel with suitable impedance characteristics. Development of such a device requires consideration of many physiological factors. The distribution and density of sweat glands must be considered to determine a location for the device on the body that will yield measurable GSR without interfering with the patient's daily activities. We are in the process of evaluating the electrical impedance of electrode and gel combinations presently used in the Carpenter lab. Quantification of the frequency dependent loading profile of the electrode-gel interface will improve the measurement accuracy of the GSR. The ionic composition of sweat and the sweat rate must be evaluated to ensure that the integrity of the interface between the body and the device is maintained throughout the monitoring period.

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