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FROM AN IDEA TO A HEALTHCARE PRODUCT-A NEW DEVICE FOR TREATING PRESSURE ULCERS

Pressure ulcers are a major complication of spinal cord injury (SCI) and often develop despite frequent repositioning. This paper describes the development of a new hypothesis on the cause of pressure ulcers and its development into a novel, sensor-driven electronic device for their treatment and prevention. A prospective study carried out to determine the history of early-occurring pressure ulcers among patients with SCI admitted to the former Charity Hospital, New Orleans showed, as expected, that duration of immobilization prior to ward admission was a significant risk factor. However, the strongest risk factors were low systolic blood pressure and low partial pressure of oxygen at the time of admission to the emergency department. Poor circulatory function thus appeared to be a more important cause of ischemic injury and resultant ulcers than external pressure. These findings suggested that maintaining adequate tissue perfusion was the key to treatment and prevention. A new method was thus conceived of continuously monitoring tissue oxygenation at areas of high risk, combined with using therapeutic electrical stimulation to increase blood flow and raise tissue oxygenation when the level dropped below a set point. In subsequent research, tissue oxygenation at the sacrum was found to be lower in patients with SCI than in controls; furthermore, high voltage pulse galvanic stimulation (HVPGS) at 75 Hz applied to the back of patients with SCI lying supine increased transcutaneous oxygenation levels at the sacral area into the normal range within 10 minutes. A method has since been patented for automating and performing this task, called COMAS (Cutaneous Oxygen Monitoring and Stimulation) and discussions are underway to develop and manufacture the device.

Biography

Anthony R Mawson has completed his MA from University of Essex, England and Doctor of Public Health from Tulane University School of Public Health & Tropical Medicine. He is a Professor in the Department of Epidemiology and Biostatistics, School of Public Health, Jackson State University, Jackson, Mississippi, USA, and he is the President of Chalfont LLC, a medical research and development company in Jackson, MS.

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