System to Map Neuropathy in Extremities of Diabetic Patients (Ramot)

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The Invention

The invention is a new and objective device for detecting diabetic neuropathy in the feet which are by far the most common points for loss of nerve activity in diabetic patients. It consists of an array of computer-controlled stimulators in a floor mat with an interactive patient feedback system for determining quantitative, objective and standardized maps of distributions of hot temperature perceptions at the feet of an individual. When the patient places his feet on the mat, a series of random stimulations (heat) are initiated and the patient marks where he feels the stimulation on a screen image. The unit correlates the patient's responses with the known stimulations and a map of sensitivity is prepared for the doctor's analysis.

The Need

Diabetic neuropathy is a peripheral nerve disorder caused by diabetes. Neuropathy is considered the most common serious complication of diabetes and consists of nerve atrophy in the extremities. Loss of sensation in the feet is the most common symptom of diabetic neuropathy. This loss of sensation is manifested in numbness or insensitivity to pain or temperature. Blisters and ulcers may appear on numb areas of the foot because sustained mechanical loading (pressure, shear) and even actual injury go unnoticed. If foot injuries are not treated promptly, infection may occur that spreads sub-dermally and into the bone. Progressive ulcers often require amputation of the toes or the entire foot. Current methods for diagnosing neuropathy are based on operators applying probes to the skin and checking the patient's response. These tests are labor consuming, require visits to the clinic, and may be inaccurate due to probe orientation and pressure. Furthermore, they do not have high spatial resolution.

Advantages

The advantage of our device is its objectivity, repeatability and elimination of the need for human interaction. The unit can be home based with results sent remotely to the care facility for monitoring.

Stage of Development

A prototype device is being designed

Patent

Patent pending in US Europe and China

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