

Development of a biofeedback tilt-table for investigating orthostatic syncope in patients with spinal cord injury

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摘要

Abstract

The purpose of this study was to develop a biofeedback tilt-table for automatic tilt-table training, helping patients with spinal cord injury (SCI) to recover more rapidly from orthostatic hypotension, and increasing safety to avoid syncope during training. This biofeedback tilt-table implemented automatic training maneuvers and included three closed feedback loops to monitor the acquisition of physiological signals from patients and the feedback of presyncope symptoms (PS) to regulate the angle of tilt. The results of clinical testing revealed that the mean blood pressure and oxygen saturation represented the most useful physiological signals for determining PS feedback and the quantitative criteria adopted were practicable and useful in describing the level of PS. This novel biofeedback tilt-table system offered higher patient throughput, faster training and safety in training of SCI patients to overcome their orthostatic hypotension than traditional tilt-table training, and could provide quantitative information of PS to assist medical staff in studying the mechanism of orthostatic syncope