

• 系統編號	RN9404-1830	
• 計畫中文名稱	研發自動回饋控制之幫浦循環器解決脊髓損傷者姿勢性低血壓引起之暈眩	
• 計畫英文名稱	Development of a Feedback Control Pumping Circulator to Prevent Postural Hypotension	
• 主管機關	行政院國家科學委員會	• 計畫編號 NSC92-2218-E038-003
• 執行機構	臺北醫學大學醫學系	
• 本期期間	9208 ~ 9307	
• 報告頁數	12 頁	• 使用語言 中文
• 研究人員	賴建宏 Lai, Chien-Hung	
• 中文關鍵字	姿勢性低血壓; 脊髓損傷; 下肢幫浦循環器; 生理參數	
• 英文關鍵字	Posture hypotension; Spinal cord injury; Circulator pumping system of lower extremities; Cardiovascular response	
• 中文摘要	<p>高位脊髓損傷病患因自律神經傳導障礙，導致姿勢改變時，產生姿勢性低血壓，並併發眼花、暈眩的狀況。為幫助姿勢性低血壓患者改善暈眩狀況，本研究利用一套具自動回饋系統之下肢幫浦循環器，量測可量化之生理參數：血氧濃度、心律、血壓與呼吸頻率，變更不同的施加壓力，將積存於下肢的血液壓回，以研究不同傾斜床角度與不同幫浦壓力下病患之生理狀況，以供作為自動控制策略之訂定與研究。結果可以看到當無任何幫浦壓力施加時，血壓會隨傾斜床角度逐漸升高而下降，而當有幫浦壓力施加於下肢時，血壓會因幫浦壓力的增加而回升，但幫浦施加壓力大到一定程度時，其效益反而無法與幫浦壓力成正比，因此可證明幫浦壓力之改變有助於改善姿勢性低血壓，再進一步分析，更可以得到收縮壓與舒張壓對應幫浦壓力與傾斜床角度之模型，由此血壓模型之建立，可以作為病患血壓於不同傾斜床角度與幫浦施加壓力下之預測，供自動控制策略訂定之參考。</p>	
• 英文摘要	<p>One of the major cardiovascular and hemodynamic complications in individuals with spinal cord injury (SCI) is postural-related orthostatic hypotension. It can interfere and delay medical and rehabilitation treatment. Patients with SCI above T6 interrupt the sympathetic pathways from brain stem to sympathetic nerves and disrupt the voluntary muscle contractions of the lower extremities. Therefore, these patient may suffered from impairment of blood control in the responses to postural change and severe venous pooling in the lower extremities. Using a tilt table or elevating a reclining wheelchair gradually is the common practice for patient with SCI to achieve the upright position. However, it would be a time-consuming process. A variety of external compression methods, like</p>	

abdominal binder, elastic compression stockings and pressure boots, have been used to try to alleviate the effects of orthostatic hypotension, with inconsistent results. The purpose of our study is to try to develop a circulator pumping system of lower extremities (CPSLE) to alleviate the posture hypotension in subjects with (SCI) and to evaluate the effects of this CPSLE in controlling the posture hypotension in individuals with spinal cord injury. This study used a randomized control trial with repeated measure design. Both patients with SCI and healthy able-bodied subjects underwent tilting table test from 0° to 75°. All participants were strapped in place on the tilt table. Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), and etc. cardiovascular response of subjects were measured by using physiological monitor device. The ECG recorders were put on the chest, the rubber bladder of the pressure cuff was applied on the arms, and the CPSLE was set to both lower legs of participants. The results showed this CPSLE system could alleviate posture hypotension in individuals with SCI above T6.