• 系統編號	RN9611-1060
• 計畫中文名稱	總計畫---網路化暨嵌入式智慧型病人維護系統在重症醫學之研究(I)
• 計畫英文名稱	Web-Based Infotronics Structure of Intelligent Maintenance Patients in Critical Care Medicine (I)
• 主管機關	行政院國家科學委員會 • 計畫編號 NSC94-2212-E038-001
• 執行機構	台北醫學大學外科
• 本期期間	9408 ~ 9507
• 報告頁數	11 頁 • 使用語言 中文
• 研究人員	高明見; 韓吟宜; 謝建興; 黃勝堅; 范守仁 Kao, Ming-Chien; Han, Yin-Yi; Shieh, Jiann-Shing; Hung, Sheng-Jean; Fan, Shou-Zen
• 中文關鍵字	快速傅立葉轉換; 不可逆呼吸停止; 病人維護系統
• 英文關鍵字	Fast Fourier transform; Irreversible apneicComa (IAC); Patient maintenance system; PoinCare' plot
• 中文摘要	本研究計畫主要是建立網路化的智慧型病人維護系統。而子計畫一、子計畫三、子計畫四、子計畫五分別針對開刀房的紀錄監測、加護病房生理的訊號分析、及後端的醫療資料庫管理進行研究。子計畫一，建構一個網路化智慧型的病人維護系統，將系統整合技術應用在開刀房的智慧型病人維護系統上，藉由病人生理訊號的收集與病歷資料的記錄，建立醫療資料庫。完成嵌入式資料擷取系統，連結醫院開刀房內的醫療裝置，並且將病患的生理訊號以數位化的方式，透過網際網路傳輸記錄在電子資料庫中以備查詢，再建立醫療記錄系統，利用觸控式輸入手術過程的醫療資訊，再透過網路通訊傳至遠端資料庫，並整合所完成之建立完整的智慧型病人維護系統。子計畫三，主要探討腦神經外科加護病房內之不可逆窒息昏厥(Irreversible Apneic Coma, IAC)患者與腦死患者其心率變異度，分別利用時域參數、頻譜分析(HF/LF, HF/TF)和非線性的Poincare plot 分析方法求得 SD1、SD2、SD1/SD2 等參數，證明心率變異度與 IAC 病人、正常人或是腦死之相關性。子計畫四，對加護病房中之創傷病患，利用動脈血壓在頻譜分析下所得參數，與臨床目前習知之組織缺血指標做對照，求得可即時顯示病人狀況的缺血指標，期望可指引醫療自動化的進行及監測急救目標的達成。子計畫五，本子計畫的目標爲建立生理訊號傳輸格式，整合子計畫一中的嵌入式擷取系統，建立生理訊號管理系統。希望建立比對資料庫及確立電子資料傳輸格式，進而訂定傳輸資料檔格式。
• 英文摘要	The purpose of this project is to combine each sub-project to set up a platform for web-based structure of intelligent maintenance patients in critical care medicine to offer the evidence-based medical care of patients in clinical medicine. A generic web-based

embedded system will be designed for data collection in operating theatre (OT), neurosurgical intensive care units (NICU), and trauma intensive care units (TICU). Also, the personal computer (PC) device will be implemented into this system in order to obtain some clinical signs which are unable to input to embedded microprocessor. Sub-project 1 established a web-based patient maintenance system (PMS). It applies the system integrated technology to patient maintenance system in operating room. We establish a medical database via collecting vital signs and recording basic information of patients. In hospital, those data of vital signs and surgery records will be saved to a personal computer server. Sub-project 3, to find the heart rate variability (HRV) of irreversible apneic coma (IAC) and brain death for the clinical correlation research. IAC, or the rather controversial term brain death, is defined as the irreversible loss of function of the brain. Sympathetic storm, a cardiovascular hyperdynamic state occurring in the process of brain stem failure, has been well studied in animal models. Observations of hypertension and tachycardia due to intense vasoconstriction in IAC patients have been described in clinical settings. The Poincare plots are the non-linear analysis of HRV. We calculate Poincare plot index (SD1,SD2 and area) and frequency index (HF/LF, HF/TF). Finally, we discuss the relationship between HRV and autonomic nervous system and observe the Poincare plots of three groups (IAC, normal coma and normal). Sub-project 4, the purpose of this project is to develop a hypoxia index, a real-time online monitor, using spectral analysis of arterial blood pressure (ABP) which is basically available in every critically ill patient. Compared with other physiological parameters well-established to indicate the shock state (such as serum lactate level, venous oxygen saturation, etc.), the hypoxia index detects tissue hypoxia and ischemia in the setting of critical illness more easily. This helps to direct the clinical decision making to keep aggressive medical treatment or turn toward palliative critical care for the terminal life. Sub-project 5, the purpose of this sub-project is to combine the embedded record system of sub-project one to develop a vital signs managing system. We hope to set up medical database and establish the electronic format for data transmitting via discussing with engineers and medical doctors.