Background information:

The Nursing Information System of Taichung Veterans General Hospital upholds the principle of patient-centered critical care, regards SCIENCE (Smart Critical Care: Innovation, Evidence-based, Network, Cloud, eHealth) as the core value, and develops eight featured nursing operating systems as follows: 1) Medical Orders Real-time Warning System; 2) Severe Sepsis Warning and Care System; 3) Structural Nursing Handoff Communication System; 4) Body Fluids Color Judgment Standardized System; 5) Digital Mobile System for Central Vascular Catheter Bundle; 6) Digital Mobile System for Phlebitis Hypertonic Drugs Assessment and Care; 7) Digital Mobile System for Wound Assessment and Care; 8) Input and Output Automatic Upload System.

The eight smart critical care operating systems are combined with relevant medical operations (medical information system, examination information system, pharmacy operating system, and nursing authority management server), and use various data input devices (mobile phone, tablet, computer, bedside monitor, electronic scale, and electronic blood pressure monitor) to monitor the physiological parameters of patients in critical condition. Assessment tools are used to collect patients’ real-time status, and integrate the data into a concordant database to form a patient-centered information and warning system, in order to improve safety care for patients and the high standards of satisfaction with the spirit of innovation and evidence-based medicine.

An integrated smart critical care model to improve efficiency and care quality:

Significant results & achievements:

Result indicators of “SCIENCE” are as follows: “Medical Orders Real-time Warning System” alerts nursing personnel’s timing for providing medicine and care based upon doctor’s prescription. 80 minutes earlier than the traditional operation. (95% C.I.: 99.05 ~ 61.65, p < .001); as to the “Severe Sepsis Warning and Care System”, the earlier the process of early goal-directed therapy(EGDT) in septic shock was initiated, the better was patient survival outcome, (81:242 min in survival vs. 221±415 min in non-survival, p=.030); in the “Structural Nursing Handoff Communication System,” the time of handoff was reduced from 8.8 to 4.4 minutes per patient (p < .05); in the “Body Fluid Color Judgment Standardized System,” the usage rate of the color card has reached 86.2% in 3 years; in the “Digital Mobile System for Central Vascular Catheter Care Bundle,” central line associated blood stream infection density reduced from 3.56 % in 2010 to 2.0 % in 2013, which is much lower than the average 4.8 % of medical centers in 2013. The average following rate of monitoring line placement is 98%; in the “Digital Mobile System for Phlebitis Hypertonic Drugs Assessment and Care” regarding patients’ vein injection for permeability with hypertonic drugs, the extravasation rate has been 0% from September 2013 to the present; in the “Digital Mobile System for Wound Assessment and Care,” with the input of the Braden high-risk pressure sore assessment, the time of the nursing program and quality monitoring are significantly reduced by 52%; in the “Input and Output Automatic Upload System,” delay time of data uploading by electronic scales is reduced from 49.5 to 0.07 minutes (p < .01).