Reduce CLABSI of a Medical Intensive Care Unit in a Tertiary Referral Center in Taiwan

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Abstract
The central line-associated blood stream infection (CLABSI) rate of intensive care units (ICU) in a tertiary referral center was 3.89‰ in 2016, higher than the average rate of ICU in all medical centers in Taiwan, where the rate was 2.6‰ (Taiwan Centers for Disease Control). Moreover, the infection rate of CLABSI in the medical ICU of this hospital was more higher (8.79‰), which motivating us to form a project to improve this phenomenon. This project included: (1) correct hand hygiene (2) laying the sterile cloth towel from head to toe, disinfecting the skin with 2% chlorhexidine gluconate (CHG), and selecting the appropriate placement sites to avoid the use of femoral veins, the need for daily assessment of catheters, and the removal of unnecessary catheters as early as possible. (Berwick, Calkins, McCannon, & Hackbart, 2006)

Key words
central line-associated blood stream infection (CLABSI), intensive care units (ICU), bundle care

Problem establishment
After analysis of all processes of patients care, the higher rate of CLABSI of medical ICU was established as follows: (1) Failure to perform hand hygiene; (2) The selection of the central catheter placement site is incorrect; (3) The sterile cloth towel is not laid correctly; (4) The timing of placement and removal is incorrect; (5) The disinfection of central catheter and dressing coverage are incorrect; (6) Failure to perform the injection cap disinfection; (7) Lack of complete and effective monitoring methods

Project purpose
To reduce the infection rate of CLABSI to below 4.0‰

Articles review
A central line-associated blood stream infection is a laboratory-confirmed bloodstream infection (BSI) in a patient who had a central line within the 48 hour period before the development of BSI, and that is not related to an infection at another site. The CLABSI rate per 1000 central line-days is calculated by dividing the number of CLABSI by the number of central line-days and multiplying the result by 1000 (O’Grady et al., 2011). Bundle care refers to the suggestion of empirical evidence, forming a group of scattered measures to improve the performance (Galpern, Guer-reno, Tu, Fahoum, & Wise, 2008). In 2006, the Institute for Healthcare Improvement (IHI) first proposed: hand hygiene, the largest sterile surface from head to toe, disinfecting the skin with 2% chlorhexidine gluconate (CHG), and selecting the appropriate placement sites to avoid the use of femoral veins, the need for daily assessment of catheters, and the removal of unnecessary catheters as early as possible. (Berwick, Calkins, McCannon, & Hackbart, 2006)

Figure 1 Intensive care unit high CLABSI rate Fishbone Diagram

Result evaluation
The rate of CLABSI in the medical ICU was reduced from 8.79 to 3.56‰.

Discussion and conclusion
The biggest resistance in the initial stage of the project came from the physicians. Since the physicians were decision-maker and performers of the central catheter placement. BSI bundle care cannot be promoted effectively without the cooperation of physicians. However, through the help of the nursing specialist and cross-disciplinary discussions with the intensive care unit director and the members of infection control team, BSI bundle care was implemented successfully and also was included in the training education of residents. Before the central catheters placement by physicians, the checklist and the graphic card were provided to enable the physicians to familiarize and implement the entire standard procedure. The nurses also worked with the physician to assess whether the central catheter needs to remain in place or not. We hope the continuously monitoring, evaluation, and implement of this project will benefit more critically ill patients in the future.

References
