

Using a Game Card Teaching Model and Interdisciplinary Care to Improve Bloodstream Infection Rates in Adult Intensive Care Units

Hui-Chun Tu* 1

Infection Control Center, National Taiwan University Hospital, Hsinchu, Taiwan

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INTRODUCTION

- Our hospital, established as a new regional medical center in December 2019. In January and February 2023, the unit's central venous catheter-related bloodstream infection rate was higher than twice the control standard deviation (+2 Sigma), exceeding the average value of 1.77 ‰ from 2022, as well as the peer values of 2.45 ‰ from regional hospitals and 2.52 ‰ from district hospitals, as shown in Table 1.
- In 2022, the unit's central venous catheter-related bloodstream infection rate was 1.77 ‰, with an average central venous catheter utilization rate of 75.0%. However, from January to March 2023, the average central venous catheter-related bloodstream infection rate increased to 7.28 ‰, as shown in Table 2.
- Through interdisciplinary care and root cause analysis, utilizing interactive teaching with game cards, we aimed to enhance the knowledge and skills of unit healthcare staff on CVC Bundle, establish effective management protocols, and ultimately reduce the CLABSI rate in adult ICUs.

Table 1 : Central Venous Catheter-Related Bloodstream Infections In the Intensive Care Unit from January to March 2023

Item	112		
	Jan	Feb	Mar
Number of Central Venous Catheter-Related Bloodstream Infection Cases in the Intensive Care Unit (Persons).	2	3	3
Central Venous Catheter-Related Bloodstream Infection Rate in the Intensive Care Unit (‰).	5.65	9.46	7.01

Table 2: Data Related to Central Venous Catheters.

Item	Year			
	111	112	112	112
	Annual	Jan	Feb	Mar
Central Venous Catheter Utilization Rate (%)	75.0	74.1	70.6	83.3
Central Venous Catheter-Related Bloodstream Infection Rate. (‰)	5.65	5.65	9.46	7.01

AIM

- Improving Bloodstream Infection Rates in Adult Intensive Care Units.

METHOD

- To enhance infection control effectiveness, we adopted a cross-disciplinary care model, conducting a comprehensive analysis of infection cases and monitoring infection indicators within the unit. We reviewed and revised the central venous catheter (CVC) procedures to ensure they meet the latest standards and requirements.
- Each day, the medical and nursing departments jointly review and assess the necessity of CVC placement and the completeness of wound care, ensuring that every step aligns with best practices. Additionally, the infection control center conducts monthly audits, providing feedback on deficiencies in CVC bundle care and hand hygiene. The unit promptly implements corrective actions upon receiving this feedback. This real-time deficiency improvement mechanism helps to increase the unit's responsiveness and timeliness in addressing abnormal infection indicators, thereby effectively reducing infection risks, as shown in figure 1.

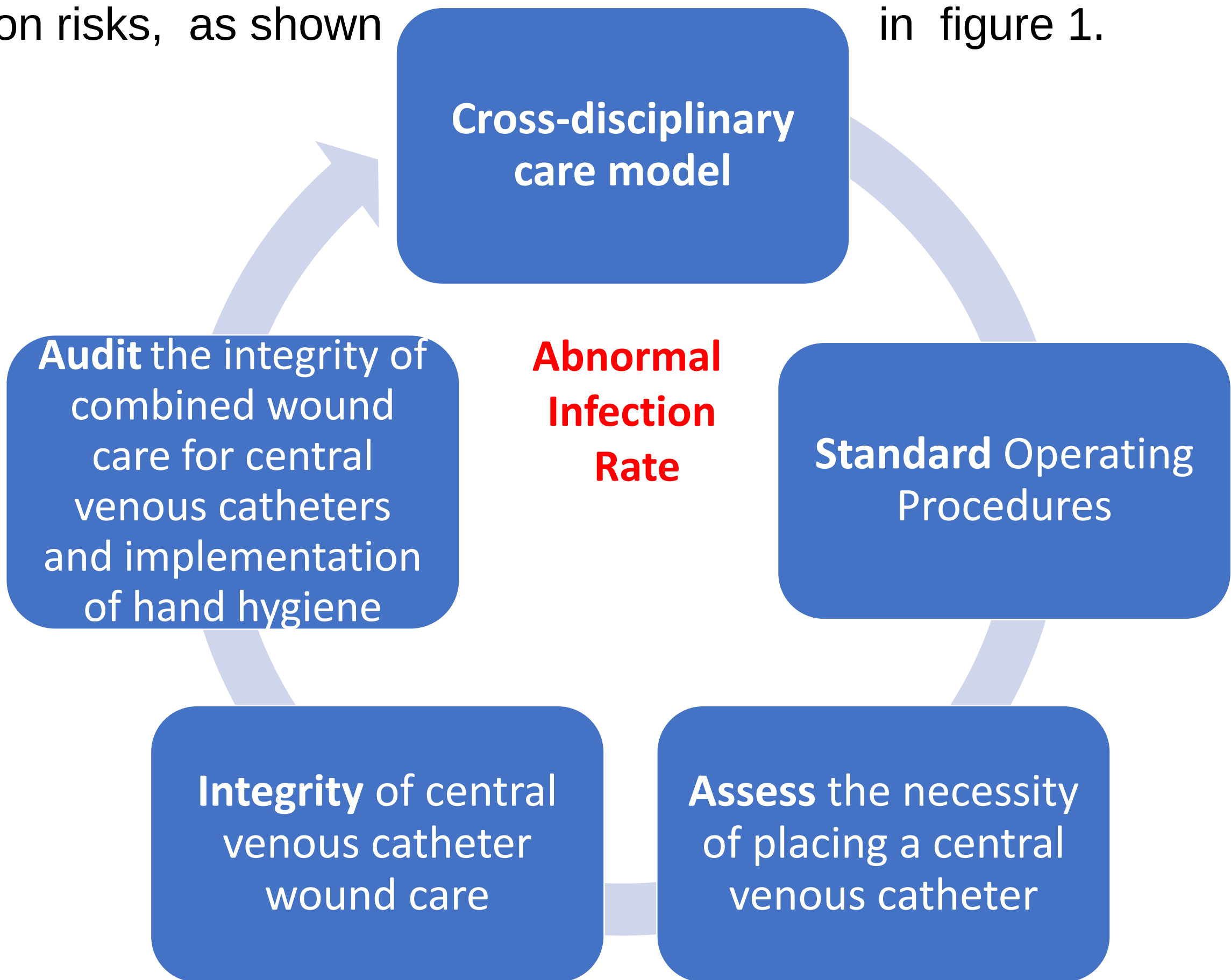


Figure 1.

RESULTS

- Two months after implementing the improvement measures, the rate of central line-associated bloodstream infections in the unit increased to 7.85‰. A root cause analysis was conducted again, and further intervention measures were implemented for improvement, as shown in Table 3.
- Table 3 : Central Venous Catheter-Related Bloodstream Infections in the Intensive Care Unit from January to September 2023
- | Item | Jan | Feb | Mar | April | May | June | July | Aug | Sep |
|---|------|------|------|-------|------|-------|------|-----|-----|
| Number of Central Venous Catheter-Related Bloodstream Infection Cases in the Intensive Care Unit (Persons). | 2 | 3 | 3 | 0 | 3 | 3 | 1 | 0 | 0 |
| Central Venous Catheter-Related Bloodstream Infection Rate in the Intensive Care Unit (‰) | 5.65 | 9.46 | 7.01 | 0.0 | 7.79 | 10.03 | 3.76 | 0.0 | 0.0 |
- To address the unit's failure to properly assess and care for central venous catheter (CVC) wounds, the Infection Control Center conducted a CVC Bundle questionnaire to gauge the staff's knowledge. Based on the questionnaire results and the issues identified during the audits, relevant training courses were designed to enhance correct care practices, as shown in figure 2.

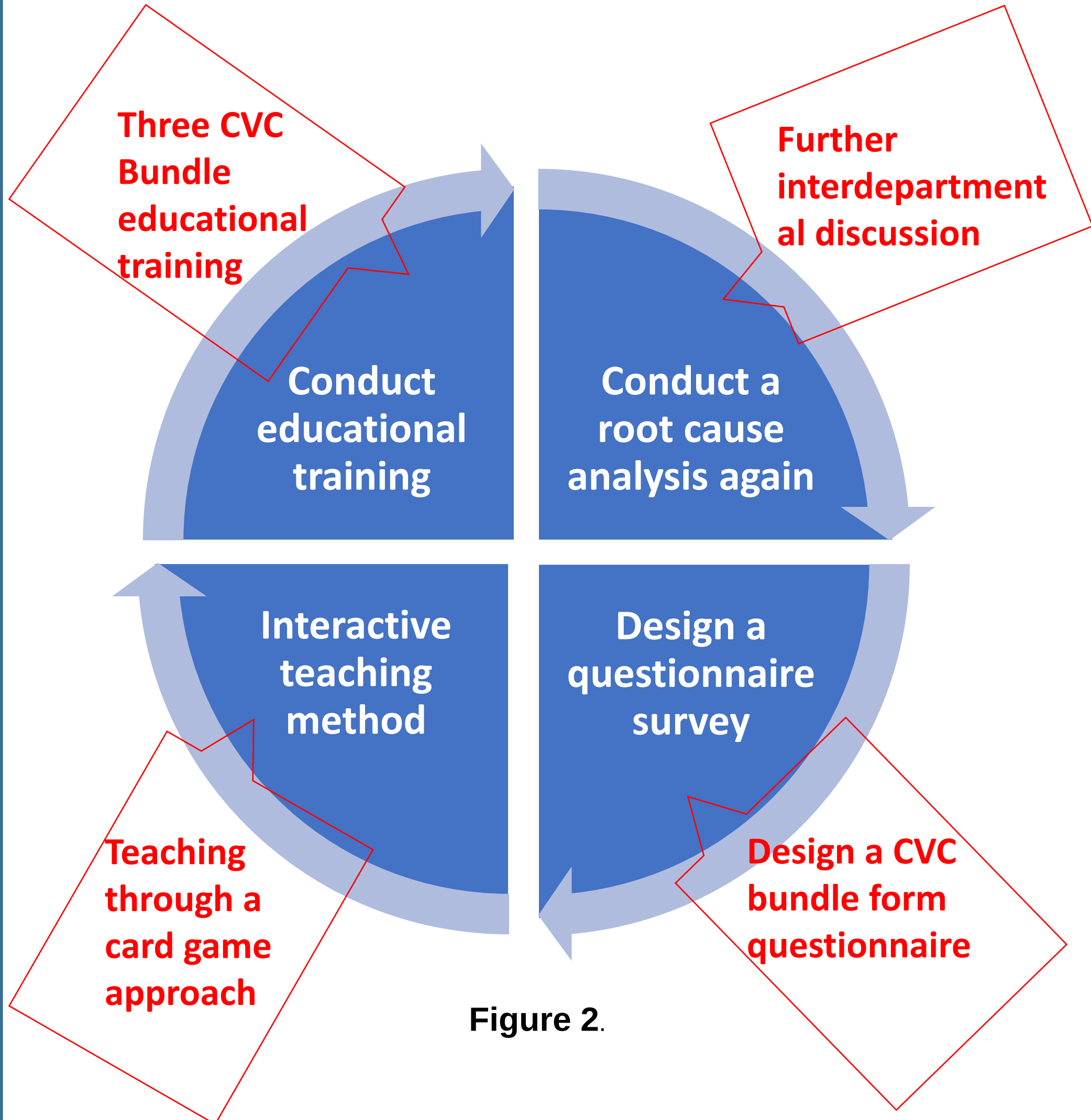


Figure 2.

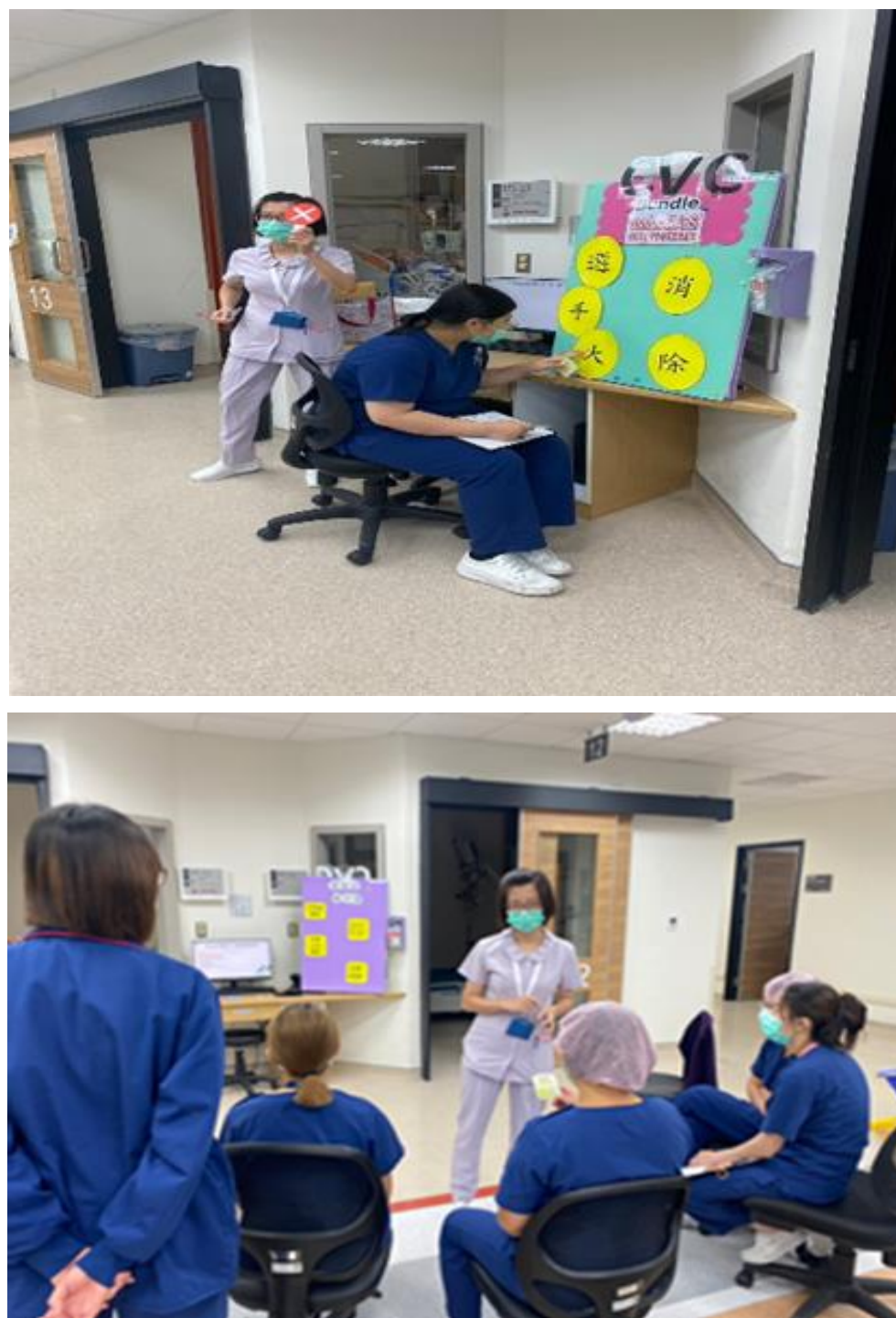


Figure 3.

- The Infection Control Center used game cards in three training courses to reinforce staff's understanding of CLABSI concepts through interactive participation, as shown in figure 3.

CONCLUSIONS

- The Infection Control Center used an interactive teaching model with game cards and interdisciplinary care to standardize Central Venous Catheter (CVC) protocols. This initiative improved care accuracy through audits of wound care and injection practices. Routine education on hand hygiene and CVC management led to a decrease in central line-associated bloodstream infections (CLABSI) in the ICU to 2.3 per 1,000 catheter-days, enhancing healthcare quality and patient safety while reducing hospital stays and costs.

REFERENCES

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CONTACT INFORMATION

- Author's contact email : G81486@hch.gov.tw