

Promoting CVC bundle to Improve Central Venous Catheter-Related Bloodstream Infection Rates in PICU

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Introduction

Critically ill pediatric children and premature infants require a variety of intravenous infusions, drug treatments, or total intravenous nutritional infusion when they are unable to eat. Establishing a good intravenous catheter is a very important lifeline for vulnerable children. Therefore, the use of central venous catheter bundle care (CVC bundle care) can reduce bloodstream infections and improve the quality of care.

Purpose/Methods

Since 2022, the infection rate in PICU has increased from 2.18‰ in the first half of the year to 7.64‰ in the second half of the year. Our investigation showed the cause was central venous catheter-related bloodstream infection. Therefore, we promoted the CVC bundle during the placement of central venous catheters to resolve the issue.

Because of frequent invasive treatments for critically ill children in pediatrics, protective equipment for medical staff include surgical caps, masks, sterile isolation gowns, and 2-3 pairs of sterile gloves. It took approximately 15 to 20 minutes to prepare these items as they were stored in different locations. Improvement strategy: Based on the principle of CVC Bundle to streamline and centralize the placement of supplies, a dedicated work cart is designed to reduce the time required to prepare supplies.

The standard method of disinfecting tubes was to use cotton sticks containing 75% alcohol and iodine to wipe the needle insertion site. The disinfectant should stay at the site for 2 minutes to take effect. It was found that disinfection via the cotton sticks could not effectively clean the needle. Improvement strategy: Replace the disinfection method of cotton sticks with using sterile alcohol cotton pads to rub and wipe the injection cap for 15 seconds and then inject the drug. This new method is recommended according to the US CDC guidelines for BSI prevention.

Results

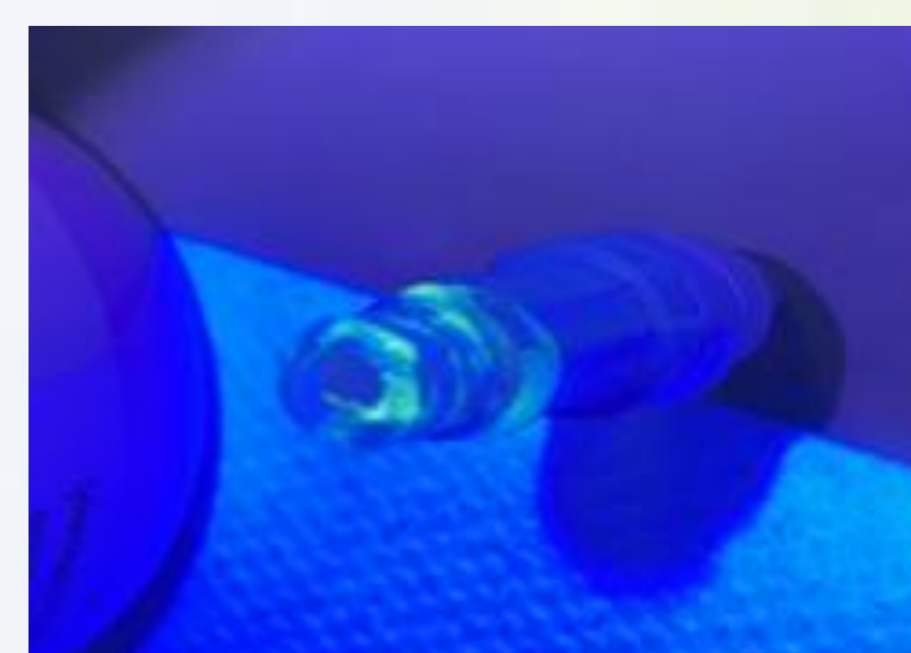
Using the Bundle cart not only shortens the preparation time from 15-20 minutes to 4-6 minutes, but also reduces the risk of bloodstream infection by decreasing the exposure of sterile areas. The rate of central venous catheter-related bloodstream infection in PICU dropped from 7.64‰ in the third quarter of 2022 to 0.88‰ in 2023. We continue monitoring the infection rate closely.

Conclusion

It is our ongoing goal to improve the quality of medical care by simplifying the process, and to promote the new disinfection method of sterilizing intravenous caps to all hospital units. We strive to maintain patient safety and become an evaluation indicator for every hospital.

Keywords

CVC bundle, sterile surface, rub disinfection



cotton sticks containing 75% alcohol and iodine to wipe the needle insertion site → **unclear**



using sterile alcohol cotton pads to rub and wipe the injection cap for 15 seconds → **clear**