INTEGRATED DELIVERY SYSTEM OF DISINFECTION CAP AND FLUSH SYRINGE, PLUS STAFF EDUCATION, REDUCE BLOODSTREAM INFECTIONS AND TREATMENT COSTS

Saungi McCalla, MSN, MPH, RN, CIC
Director of Infection Control

White Plains Hospital
White Plains, N.Y.

Co-authors:

Janet Greco, MA, RN-BC, OCN
Meg Warren, MSN, RN-BC, CPAN
Patricia Byrne, RPh, MPA
Joyce Bogetti, RN

From left;

Meg Warren
Saungi McCalla
Patricia Byrne
Janet Greco

Presented at:
AVA 2012
Annual Scientific Meeting
San Antonio, Texas
October 16–19

Purpose

White Plains Hospital (WPH) in White Plains, N.Y. had mandated the traditional method for manually disinfecting IV connector hubs with isopropyl alcohol (IPA) prior to line accesses. In early 2010, unsatisfactory rates of bloodstream infections were found in PICC lines. Interviews of nurses revealed that variance from, and noncompliance with, the manual method may have increased infection risk.

Disinfection cap

The hospital sought to trial an evidence-based disinfection cap (SwabCap,® Excelsior Medical), an engineered device intended to protect the IV connector and compensate for lapses in manual disinfection. The cap dispenses IPA when twisted onto luer-lock IV connectors.

Disinfection cap on IV connector

The cap's design appeared to address WPH's connector disinfection issues as follows:

- Because the cap can only be twisted on one way, like a lid on a jar, it eliminates variance in disinfection technique.
- The cap's bright orange color supports protocol compliance because it is easy for a supervisor to spot when it is in place.
- It creates a closed system on the hub, keeping the luer-lock connector bathed in IPA as long as the cap is in place. As the CDC has noted, the longer a surface is exposed to IPA, the greater the bacteria kill.
- The retention seal helps to create a closed system when the cap is applied to all luer lock IV access ports, including the IV tubing Y-sites.

Project Description

WPH choose to trial the cap as part of an integrated delivery system (SwabKIT,® Excelsior Medical) that packages the cap with a flush syringe. The combination of cap and syringe is intended to improve compliance with cap use, by making the cap readily available to nurses after they use the syringe to flush the line.

Following a successful two-week trial, the kit was implemented hospital-wide for use on:

- All central venous catheters
- All peripheral IVs
- All tubing openings (e.g., Y-sites), to create a closed system.

Usage was reinforced with staff education.

Kit that packages disinfection cap with flush syringe

Major Outcomes

	Sept. 2010–Feb. 2011 (pre-implementation)	Sept. 2011–Feb. 2012* (kit use)
Bloodstream infections (no.)	14	**4**
Bloodstream infection rate	3.85/1,000 line days	**1.14/1,000 line days (70.4% reduction)**
Annual avoided treatment costs	N.A.	**$583,320****

*Through end-of-July 2012, only one CLABSI has occurred in PICC lines since February 2012. This makes the overall CLABSI rate since the kit was implemented 0.68/1,000 line days, an 82% decrease from the six-month period prior to implementation.

**Calculation: The CDC assumes an excess healthcare cost of $29,166 per bloodstream infection. WPH avoided 10 bloodstream infections in six months for a savings of $291,660 (10 x $29,166). This projects to savings of $583,320 over 12 months (20 x $29,166).

Conclusions/Implications for Practice

- Patient safety can be increased by using the kit to create a closed IV system that also encompasses peripheral IVs.
- Comprehensive disinfection cap use is associated with lower bloodstream infection rates.
- Implementing the disinfection cap/flush syringe kit to reinforce compliance with cap use, and also supporting cap use with education, expedited nurses' transition to cap use.
- Avoided treatment costs are much greater than cap acquisition costs, justifying the upfront expense of acquiring the cap.

Limitations

Prospective observational study following interventions. Not a randomized controlled trial.

Funding Source

None

Disclosure Statement

Excelsior Medical (Neptune, N.J.) is reimbursing the author for travel and hotel expenses to attend this conference.