BioPatch Usage in the Surgical Intensive Care Unit

Organization: University of Maryland Medical Center  
Type: Acute Care  
Primary Contact: Melissa C. Custer, BSN, RN  
E-mail: mcuster@umm.edu  
Phone: 410.328.6454

IDENTIFICATION:
Central venous catheters (CVC) are used in hospitals throughout the world and are especially important in ICU settings. Although an important part of ICU care, CVCs put patients at increased risk for costly blood stream infections (BSI) that can increase mortality. Recently, the implementation of evidence-based best practices for the prevention of central line-associated BSI has become an infection control performance standard of the Joint Commission. Additionally, the Center for Medicare/Medicaid Services (CMS) has initiated restrictions on reimbursement for this infectious complication.

In FY 2008, the CVC-BSI rate in the SICU was 5.9 per 1000 central line days. This is no better than the FY07 rate of 5.8 per 1000 central line days, and is higher than the national average of 5.3. As a result of this rate, UMMC implemented the BioPatch dressing in conjunction with other best practices, such as the central line cart, maximal barrier precautions and the central line insertion checklist in October 2006. The BioPatch is a powerful antimicrobial dressing impregnated with chlorhexidine gluconate that has been shown to reduce CVC-BSI. The manufacturer recommends that the BioPatch be used in conjunction with a transparent, occlusive, sterile dressing and that it remain in place for 7 days, unless saturated. When the BioPatch becomes saturated, the dressing should be changed.

Despite these interventions, the SICU has not yet realized a significant reduction in CVC-BSI.

The aims of our QI project were to:
1) examine if the BioPatch is being applied and changed as recommended by the manufacturer
2) examine the cost of BioPatch use in the SICU
3) determine if the BioPatch is appropriate to use in all SICU patients

PROCESS:
With guidance from the Department of Infection Control, an Infection Control Task Force of 15 SICU nurses was assembled to observe the central lines of patients in 10 assigned rooms every shift for 3 weeks, for a total of 42 observations. The trained observers recorded the integrity of the dressing, the date and time the central line dressing was last changed, and whether or not the
dressing needed to be changed. The data was then analyzed to characterize observed BioPatch use vs. expected BioPatch use.

A total of 21 patients were observed. Data showed that only 5 (24%) of the observed patients had the BioPatch changed as recommended. On average, one BioPatch remained in place for only 1.42 days, compared to the 7 days recommended by the manufacturer. In fact, observations showed that the BioPatch was being changed 3 times more often than expected. In a subset of 9 patients with a LOS less than or equal to 3 days, patients were more likely to have the BioPatch changed as recommended by the manufacturer.

At UMMC, one BioPatch kit costs $9.71. The total cost of BioPatch kits for the observed patients during the three-week study period was $912.74. Based upon manufacturer recommendations of one BioPatch per patient per 7 days, the cost of BioPatch usage in this time period was expected to be $281.59. Therefore, during the three-week study period, it cost UMMC an extra $631 to provide SICU patients with BioPatch dressings.

**SOLUTION:**
As a result of this QI project, the Department of Infection Control and the SICU Infection Control team are re-evaluating the use of the BioPatch in the SICU. It is possible that there are some patients who are not good candidates for BioPatch use, such as patients that are edematous, coagulopathic and febrile. A more in-depth cost analysis will be conducted by Infection Control and the critical care value analysis team in order to evaluate the cost of BioPatch in relation to BSI rates, and to determine the future use of BioPatch in the SICU.