Accepted Oral Presentation:

Furuya EY, Dick A, Perencevich EN, Pogorzelska M, Goldmann D, Stone PW.

Central Line Bundle Implementation and Impact on Infection Rates in US Intensive Care Units (ICU).

**Background:** Central line (CL) bundles to prevent central line-associated bloodstream infections (CLABSI) are widely promoted.

**Objective:** Examine the extent of CL bundle adoption in ICUs. Determine the effect of individual bundle elements and the bundle as a whole on CLABSI rates.

**Methods:** A cross-sectional survey was performed of ICUs in National Healthcare Safety Network (NHSN) hospitals. Hospitals provided NHSN-reported rates of CLABSI/1,000 central line days, along with ICU-specific policies and compliance rates. We hypothesized that high compliance rates were needed to decrease CLABSI rates. Information regarding setting and infection control department characteristics was also obtained. We evaluated the impact of CL bundle elements on CLABSI rates with 4 models. Model 1 examined the impact of individual bundle elements. We then examined the additive value of complying with 1 or more elements by summing the number of elements met (Model 2). Model 3 tested the effect of compliance with any 1 element. Model 4 tested whether compliance with all bundle elements was necessary. Descriptive statistics were computed. All multivariate regressions were ordinary least squares with Huber-White standard errors to account for intra-hospital correlation across ICUs.

**Results:** Data were available on 312 ICUs in 250 hospitals. Mean CLABSI rate was 2.1/1000 line days, similar to the NHSN mean. 49% of ICUs reported having a CL bundle policy, but only 38% of those with a policy reported full (≥95%) compliance. When not all bundle elements were fully implemented, maximal barrier precautions were most often implemented while daily line checks and optimal site selection were least commonly implemented. Simply having a bundle policy was not associated with lower CLABSI rates; only when an ICU had a policy, monitored compliance, and had ≥95% compliance were CLABSI rates decreased. In Model 1, no individual bundle element was associated with decreased CLABSI rates. Evaluation of Model 2 (moving from zero compliance to complying with any 1 element, then to complying with any 2, etc.) demonstrated a significant decrease in CLABSI rates with bundle compliance ($\beta = -0.42, p = 0.048$). Model 3 revealed that complying with any 1 of 3 bundle elements resulted in decreased CLABSI rates ($\beta = -1.03, p = 0.015$). However, Model 4 showed that compliance with all bundle elements was not necessary to show a significant decrease in infections.

**Conclusions:** In NHSN hospitals across the US, a policy for the CL bundle is often present but frequently not well implemented. Furthermore, the bundle approach is not effective in preventing CLABSI unless it is monitored and implemented well. Full compliance with any 1 of the bundle elements led to lower CLABSI rates, whereas compliance with the full bundle was not necessary. Hospitals must focus efforts on ensuring close monitoring and full compliance with the CL bundle.

Session Number: 60
Session Title: The Cutting Edge of Infection Prevention: The Top Four Submitted Scientific Papers of the 2010 Decennial
Session Date: Saturday, March 20, 2010
Session Time: 8:30 AM - 9:30 AM