
Abstract:

BACKGROUND: “Implementation research” promotes the systematic conversion of evidence-based principles into routine practice to improve the quality of care. We hypothesized a system-based initiative to reduce nosocomial infection would lower the incidence of ventilator-associated pneumonia (VAP), urinary tract infection (UTI), and bloodstream infection (BSI).

METHODS: From January 2006 to April 2008, 7,364 adult trauma patients were admitted, of which 1,953 (27%) were admitted to the trauma intensive care unit and comprised the study group. Tight glycemic control was maintained using a computer algorithm for continuous insulin administration based on every 2-hour blood glucose testing. Centers for Disease Control and Prevention definitions of nosocomial infections were used. Evidence-based infection reduction strategies included the following: a VAP bundle (spontaneous breathing, Richmond Agitation-Sedation Scale, oral hygiene, bed elevation, and deep vein thrombosis/stress ulcer prophylaxis), UTI (expert insertion team and Foley removal/change at 5 days), and BSI (maximum barrier precautions, chlorhexidine skin prep, line management protocol). An electronic dashboard identified the at-risk population, and designated auditors...
monitored the compliance. Infection rates (events per 1,000 device days) were measured over time and compared annually using Fisher’s exact test.

RESULTS: The study group had 22,928 device exposure days: 6,482 ventilator days, 9,037 urinary catheter days, and 7,399 central line days. Patient acuity, demographics, and number of device days did not vary significantly year-to-year. Annual infection rates declined between 2006 and 2008, and decreases in UTI and BSI rates were statistically significant (p < 0.05). These decreases pushed UTI and BSI rates below Centers for Disease Control and Prevention norms.

CONCLUSIONS: Over 28 months, a systems approach to reducing nosocomial infection rates after trauma decreased nosocomial infections: UTI (76.3%), BSI (74.1%), and VAP (24.9%). Our experience suggests that infection reduction requires (1) an evidence-based plan; (2) MD and staff education/commitment; (3) electronic documentation; and (4) auditors to monitor and ensure compliance.