Evidence Based Practice: Tailored to Fit the Unique Needs of Trauma and Burn Patients

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Background & Purpose:
The TBICU is unique in that it cares for patients with inhalation injuries and large skin defects via burn injuries. The presence of inhalation injury and large skin defects is a unique risk factor in the development of VAPs and BSIs in the burn patient. Almost a decade ago we noted an unacceptable high rate of blood stream infections (BSI) and ventilator associated pneumonias (VAP) in our 10 bed trauma burn unit (TBICU). We initially implemented the Michigan Hospital Association Collaborative bundles for BSI and VAP prevention. Due to some unique characteristics of our patient population, not all of these interventions were possible.

Study/Project Design:
VAP rates as well as CR-BSI rates were measured from 1999- August 2012 for all patients admitted to the ICU

Setting:
Level one trauma center in an academic medical center in an adult ICU.

Sample:
This was a convenience sample of all adult patients admitted to the ICU from 1999- August 2012.

Procedures:
Utilizing the latest evidence through MHA Keystone ICU, our practice was improved by implementing patient care bundles to reduce the incidence of the following: Ventilator Associated Pneumonia (VAP) and Blood Stream Infection (BSI) However, due to some unique characteristics of our patient population, not all of these interventions were possible. Modification and changes made to fit the unique burn and patient population: For patients with burned skin, lines were covered with a chlorhexidine impregnated disk, covered with gauze, and changed every 4 hours. An occlusive dressing was not an option. For intubated patients, twill tapes were used to hold the ETT in place. Head of bed elevation could not be maintained in our patients due to spinal injuries. Even the use of specialty beds also created a challenge as the HOB could not be maintained at 30 degrees.

Findings/Results:
In 2002 our BSI rates averaged 14.1 infections per 1,000 line days. Currently in 2011 with the customization of the bundle, we have reduced our BSI rate to 0 infections per 1,000 line days. We applied these same principals to reduce ventilator associated pneumonia (VAP) in our ICU from a high of 31.3 per 1000 vent days in 2003 to 7.8 VAPs per 1000 vent days in 2011. We have achieved a 6-fold reduction in the TB-ICU VAP rates. The positive results of our VAP reduction in the TB-ICU was due to interdisciplinary participation within our unit. Many disciplines were involved as well as each discipline’s leader. Each discipline had its own unique contribution. The TBICU has a standardized process to complete spontaneous awakening trials (SAT). Every VAP prevented saves the hospital $25,000 (Scott 2009), and for every BSI prevented saves the hospital $6,000-$23,000 (Scott 2009). Modifying standardized processes to accommodate specialized populations can be done to achieve and sustain positive outcomes.

Discussion/Conclusions/Implications:
We believe that several components are necessary to sustain best practice: 1) Adapt best practices to fit the needs of unique patient populations 2) Creating a first line of defense using a chlorhexidine impregnated disk for central lines 3) Securement of the ETT using twill tape to minimize the movement of the tube thus preventing pneumonia 4) In addition to customizing the bundles, active engagement from front-line staff, standardized work process, and leadership support help to reduce hospital acquired infections 5) Modify practice bundles using evidence.