Catheter related bloodstream infection prevention: Simulation training saved $539,902 on CRBSI costs


Abstract:

STUDY OBJECTIVE: To study the impact of adding simulation-based education to the pre-intervention mandatory hospital efforts aimed at decreasing central venous catheter-related bloodstream infections (CRBSI) in intensive care units (ICU).

DESIGN: Pre- and post-intervention retrospective observational investigation.

SETTING: 24-bed ICU and a 562-bed university-affiliated, urban teaching hospital.

PATIENTS: ICU patients July 2004-June 2008 were studied for the development of central venous catheter related blood stream infections (CRBSI).

MEASUREMENTS: ICU patients from July 2004-June 2008 were studied for the development of central venous catheter-related blood stream infections (CRBSI). PRE-INTERVENTION: mandatory staff and physician education began in 2004 to reduce CRBSI. The CRBSI-prevention program included online and didactic courses, and a pre- and post-test. Elements in the pre-intervention efforts included hand hygiene, full barrier precautions, use of Chlorhexidine skin preparation, and mask, gown, gloves, and hat protection for operators. A catheter-insertion cart containing all supplies and checklist were was a mandatory element of this program; a nurse was empowered to stop the procedure for non-performance of checklist items.

INTERVENTION: As of July 1, 2006, a mandatory simulation-based program for all intern, resident, and fellow physicians was added to teach central venous catheter (CVC) insertion.

MEASUREMENTS: Data collected pre- and post-intervention were CRBSI incidence, number of ICU catheter days, mortality, laboratory pathogen results, and costs.
MAIN RESULTS: The pre-intervention CRBSI incidence of 6.47/1,000 catheter days was reduced significantly to 2.44/1,000 catheter days post-intervention (58%; P < 0.05), resulting in a $539,902 savings (USD; 47%), and was attributed to shorter ICU and hospital lengths of stay.

CONCLUSIONS: Following simulation-based CVC program implementation, CRBSI incidence and costs were significantly reduced for two years post-intervention.