Beyond the Bundle: Strategies to Prevent Catheter Related Blood Stream Infections in a Pediatric Oncology In-Patient Unit

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Objectives

• Discuss innovative, low-cost nursing strategies to prevent central line associated blood stream infections (CLABSI)

• Facilitate optimal clinical and fiscal outcomes
Background

- Key facts from the CDC
- 15 million Central vascular catheter (CVC) days in ICU’s in the US each year
- 80,000 catheter related bloodstream infections (CRABSIs) in ICU’s each year
- 250,000 if looking at all hospital settings
- Show increase in cost and length of stay
- Infection risk increases with nursing staff reductions below a critical level
CDC Guideline Goals

The new guidelines are

- Not designed for “getting to zero”
- Goal is to reduce the rate as low as feasible given
  - specific patient population
  - universal presence of microorganisms in the human environment,
  - and the limitations of current strategies and technologies
What is the Bundle?

• Bundles are a grouping of evidence-based practices that when adhered to, result in outcome improvement

• Bundles are an “all or none” approach and must ALWAYS be followed

• Supported by evidence to significantly reduce patient harm when implemented

• Implementation of a “bundle” standardizes infection prevention practices
What is the Bundle?

- Insertion Bundle
- Maintenance Bundle
Problem

Spike in central line associated blood stream infections (CLABSIs) despite utilization of evidence-based bundle for inserting and managing central venous catheters:

- 2012 CLABSI rate 3.49/1000
  - exceeded national benchmark
  - increased from rate of 2.72/1000 in 2011
- Culture included belief that CLABSI is inevitable in certain populations
“What’s A Fish Got To Do With It?”
CLABSI

No working space in patient rooms
- Over-bed tables were dirty and cluttered
- Parent items, toys, etc. created clutter
- Bed used as work surface

Extra hands needed
- Failure to wash between dressing removal and donning sterile gloves
  - Supplies not readily replaceable if inadvertently dropped or contaminated

Attitude that CLABSI is inevitable
- RNs and MDs felt CLABSI inevitable in immuno-compromised children

Lack of knowledge and skills with CVC Bundle procedures
- Staff unaware of CVC bundle components
  - Scrub times variable and inconsistent
Corrective Plan of Action

Creative Measures to Decrease CLABSI

• Team Formed:
  • clinical nurse specialists,
  • nursing educator,
  • nursing management,
  • infection preventionist staff nurses

• Identified issues

• Developed a plan
Staff Re-Education

- Reviewed CVC Maintenance Bundle procedures
- Demonstrated dressing change procedure
- CNS observed staff performing dressing change on actual patient
Beyond the Bundle

- Staff required to use clock to count time for skin cleansing and scrub the hub
- Instituted 2 person process for CVL dressing changes and port access
  - Nurse #1 removes old dressing
  - Nurse #2 stays sterile
  - Initially the CNS was the 2nd RN
Beyond the Bundle

- **Carts** purchased specifically to house sterile supplies for CVL dressing changes and to access ports
  - Cart stocked with all needed supplies
  - Cart top provides clean surface for sterile field
  - Carts disinfected before and after use
  - Drawers labeled for easy restocking
Outcomes

CLABSI RATE/1000 Line days
- 2011: 2.72
- 2012: 3.49
- 2013: 1.02
- 2014: 0.58

Creative Measures Implemented 2013
Evaluation of Measures

- CLABSIs decreased since implementation
  - Decreased CLABSI rate since implementation
  - 2012 rate: 3.49 per 1000 line days
  - 2013 rate: 1.02 per 1000 line days
  - 2014 rate to Nov.1: 0.58 per 1000 line days
- Culture changed: expect no CLABSI
- Cost-effective
Cost-Benefit Analysis

- Carts cost $2000 each
- Each CLABSI cost ~ $45,000\(^1,2\)
- Cost-benefit analysis score: 22.5
  (>1 is a benefit\(^3\))
- Estimated cost savings: ~ $500,000/yr.
Final Thoughts

- Continuous education and observation of performance
- Root Cause Analysis of documented infection
- Celebrate successes with staff


