GETTING TO ZERO: REDUCING CENTRAL LINE ASSOCIATED BLOOD STREAM INFECTIONS

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The 100,000 Lives Campaign: Prevent Central Line Infections

Institute for Healthcare Improvement

Getting to Zero

“Some is not a number, soon is not a time”
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“Thenames of the patients whose lives we save can never be known. Our contribution will be what did not happen to them. And, though they are unknown, we will know that mothers and fathers are at graduations and weddings they would have missed, and that grandchildren will know grandparents they might never have known, and holidays will be taken, and work completed, and books read, and symphonies heard, and gardens tended that, without our work, would never have been.”

Donald Berwick, MD, MPP
President and Former CEO
Institute for Healthcare Improvement
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- An estimated 41,000 central line-associated bloodstream infections (CLABSI) occur in U.S. hospitals each year.  

- CLABSI can be prevented through proper management of the central line.  

- Estimates of attributable cost per bloodstream infection are estimated to be between $3,700 to $29,000  
  Institute for Healthcare Improvement 1999

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**Central Line Bundle**

**What is a bundle?**

- A grouping of best practices with respect to a disease process that individually improve care, but when applied together result in substantially greater improvement.

- The science behind the bundle is so well established that it is considered standard of care.
Central Line Bundle Elements

- Hand hygiene
- Maximal barrier precautions
- Chlorhexidine skin antisepsis
- Optimal catheter site selection – subclavian vein is the preferred site for non-tunneled catheters in adults
- Daily review of line necessity with prompt removal of unnecessary lines

Hand Hygiene 101

When caring for central venous catheters, cleanse hands with soap and water or an alcohol-based waterless hand cleaner:
- Before and after palpating catheter insertion sites
- Before and after inserting, replacing, accessing, repairing, or dressing an intravascular catheter

Palpation of the insertion site should not be performed after the application of antiseptic, unless aseptic technique is maintained.

Cleanse hands if they are obviously soiled or if contamination is suspected.
Cleanse hands between patients, after removing gloves and after using the bathroom.
Maximal Barrier Precautions

- For the Provider and assistant:
  - Hand hygiene
  - Non-sterile cap and mask
    - All hair should be under cap
    - Mask should cover nose and mouth tightly
  - Sterile gown and gloves

- For other staff in room:
  - Mask should cover nose and mouth

- For the Patient:
  - Cover patient’s head and body with a large sterile drape

Chlorhexidine Skin Antisepsis

Prepare skin with antiseptic/detergent chlorhexidine 2% in 70% isopropyl alcohol.

Pinch wings on the applicator to pop the ampule. Hold the applicator down to allow the solution to saturate the pad.

Press sponge against skin, apply chlorhexidine solution using a back and forth friction scrub for at least 30 seconds. Do not wipe or blot.

Allow antiseptic solution time to dry completely.
Recommendations Regarding Site Selection

**CDC recommends:**

“...in adult patients, a subclavian site is preferred for infection control purposes, although other factors (e.g., the potential for mechanical complications, risk for subclavian vein stenosis, and catheter-operator skill) should be considered when deciding where to place the catheter.”

O’Grady NP. MMWR. Aug 9, 2002; 51: RR10, 6.

Daily Review of Line Necessity

- Avoid routine replacement of central lines, even over guidewires.
- Assess the need of line necessity daily.
- Document line necessity in medical record.
- Discuss line necessity in daily multidisciplinary rounds.
Getting to Zero
Mercy Medical Center
North Iowa’s Story

- 2004 Jerry Prazak BSN RN CCRN-CMC, Clinical Leader attended National Teaching Institute for Critical Care in Orlando Florida
- 2004 Karen Roller MS BSN RN CCRN attended the SCCM conference in San Diego California
- CLABSI prevention and Central Line Bundle information were presented at both conferences
Critical Care Medical Director, Nursing Director and Clinical Leader met to strategize how to implement best practice to prevent central line infections.

2005 Multidisciplinary workgroup was identified to implement the Central Line Bundle

- Dr. Daniel Pennington MD Medical Director
- Karen Roller MS BSN RN CCRN Nursing Director
- Jeremiah Prazak BSN RN CCRN Clinical Leader Critical Care
- Kimberly Overbeck BSN RN Co-Chairperson Nursing Practice & Standard Committee
- Barbara Stillings RN MSN Co-Chairperson Nursing Practice & Standards Committee
- Diane Carney MS BSN CCRN Staff Development Leader
- Mary White Manager Central Sterile
Mercy's Story

- Revised current policy and procedure to incorporate the CDC guidelines and the IHI Central Line Bundle
- Presented information to Critical Care and Hospital Nursing Practice and Standards Committees for approval
- Staff Development Leader and Clinical Leader in CCU developed a power point to educate staff and begin the practice change.

Mercy's Story

- Clinical Leader in CCU worked with Central Sterile Department and the vendor of the central line kits to develop a central line tray for the team inserting the central line.
- Eliminated the need for a nurse to leave the room for supplies during the procedure, avoiding another potential for contamination
Mercy’s Story

The vendor’s tray did not include
1. Extra gowns, hats, masks and gloves for assistants in the room
2. CLC 2000 positive pressure cap
3. Extra supplies in case of contamination
Mercy’s Story

- Critical Care Clinical Leader worked with vendor to develop a tray which included the vendor’s tray and additional items needed. One tray was placed on each nursing unit.
- Critical Care Clinical Leader enlisted the help of the vendor to develop a central line dressing change kit that incorporated all items needed to perform the dressing change.
- All items needed for bundle compliance were located in one place.
- Nurse did not need to leave the procedure to obtain additional supplies.
Central Line Insertion Checklist

Central Line Insertion Checklist is:

- Placed in every central line tray
- A reminder to staff
- Used for data collection
Central Line Insertion Checklist

- Weren’t always filled out so they were discontinued and we recently reinstituted them for data collection for compliance with the bundle during insertion

- Could not retrieve the data because there was not a method of pulling reports from the Electronic Medical Record

Connecting the Dots


- Expanded into a national initiative through the Trinity Health Keystone project with Trinity hospitals across the nation participating.


**Education**

- Critical Care Clinical Leader taught trainers throughout the hospital and networks about the central line bundle and the new policy and procedure.

- A videotape of the education was developed:  
  1. To educate those who could not attend a live training session  
  2. To provide education during orientation for new staff.

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Central Line-Associated Bloodstream Infections (CLABSI) in CCU

| Month  | Jan-06 | Feb-06 | Mar-06 | Apr-06 | May-06 | Jun-06 | Jul-06 | Aug-06 | Sep-06 | Oct-06 | Nov-06 | Dec-06 | Jan-07 | Feb-07 | Mar-07 | Apr-07 | May-07 | Jun-07 | Jul-07 | Aug-07 | Sep-07 | Oct-07 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| # infections | 0.0 | 2.4 | 1.1 | 1.2 | 1.0 | 0.4 | 0.3 | 0.6 | 0.7 | 0.8 | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 | 2.1 | 2.2 |
| # days | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 |

Rate: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Getting to Zero

CENTRAL LINE ASSOCIATED BLOODSTREAM INFECTIONS (CLABSI) IN CCU

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BARRIERS

- Noncompliance with:
  1. Use of the bundle during insertion
  2. Dressing change frequency and procedure
  3. Line assessment and discontinuing the line when no longer needed
Strategies

- Daily individual reinforcement and just in time training of the bundle elements
- Empower nursing staff to speak up immediately if someone begins to insert a central line without complying with the Central Line Bundle
- Include discussion of need for lines, tubes and drains during daily multidisciplinary rounds
- Role modeling by individual nursing staff and the Medical Director of CCU

Replicating Our Success: NICU Data
Summary

- 2006 - National Quality Forum developed the CMS Never Event list
- 2008 - CMS Never Events policy took effect
- Present - Culture of Safety is strived for by every hospital to prevent hospital acquired complications

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North Iowa's Story