HAI Peer Learning Network – Peer Sharing Event

Topic: CLABSI Prevention

Nov. 28, 2017
Reminders

- For best sound quality, dial in at **1-800-791-2345** and enter code **11076**
- Mute your phone during the presentation
- Don’t put the call on hold
- Please use the chat box to ask questions!

*Please note – this webinar is being recorded.*
MHA HAI Program Offerings

- Peer Learning Network
- ASP/MDRO Collaborative
- NHSN User Group
- CHAIN Fall Conference & Award
- Additional support
• Convenes the 4th Tuesday of each month
• Rotating topics (SSI, CAUTI, CLABSI, VAE) & cross-cutting adaptive techniques
• Focus on best practices and implementation science
• Formal & informal sharing, resource review, peer discussion/polling

Peer Learning Network
HAI Learning Network Contacts

Susan Klammer
Quality & Process Improvement Specialist
651-603-3529
sklammer@mnhospitals.org

Lindsey Lesher Erickson
Consultant HAI Epidemiologist
lerickson@mnhospitals.org

Nancy Miller
Program Manager - HIT/Care Coordination
Stratis Health
nmiller@stratishealth.org
Polling Question

Which aspect of CLABSI is your highest priority?

• Patient & family education
• Insertion practices
• Access/maintenance practices
• Performance improvement monitoring
• Staff education
Agenda

- Welcome
- Hospital Highlights
  - CentraCare St. Cloud Hospital
  - Mayo Clinic, Rochester
- Resource review
- MHA HAI Updates
- Wrap up
Journey to Zero CLABSIs
presented to
HAI Peer Learning Network
Tuesday, November 28, 2017
Presented by:
Melissa Fradette, MSN, RN, CCRN
Ellen Simonson, RN, MPH, CIC
St. Cloud Hospital
Re-Designated a Magnet Hospital September 2013 for the third time
First Magnet Designation June 2004

St. Cloud Hospital – 489 beds
Part of CentraCare Health
Magnet Designated – 3 times consecutively
Level II Trauma Center
One of 50 Top Cardiovascular Hospitals® by Truven
100 Top Hospitals (ten-time honoree) by Truven

Intensive Care Unit – 28 beds
Admit Medical, Surgical, Trauma, and Neuro critical care patients
CLABSI Prevention Strategies

Central Line Insertion Bundle
- Central Line Cart
- Central Line Insertion Checklist
- Evaluation of Need

Central Line Maintenance Bundle
- Scrubbing the Hub
- Minimization of Line Accesses
- Chlorhexidine Dressings and Bathing
- Dressing Maintenance
- Line Patency
- Evaluation of Continued Need
- Annual Education and Competency
SCH ICU’s CLABSI Story

• FY13
  – 1 CLABSI – 15 Days to Infection

• FY14
  – 3 CLABSIIs – > 10 Days to Infection
  – Evidence suggests CLABSIIs acquired > 10 days from insertion are related to maintenance practices; CHG bathing targeted at maintenance related CLABSIIs

• FY15
  – 3 CLABSIIs – < 10 Days to Infection
  – CHG bathing implemented 11/18/14 (2 of 3 CLABSIIs after implementation)

• FY16
  – 3 CLABSIIs – < 10 Days to Infection

• FY17 – No CLABSIIs
Data Review

• January 2014 to August 2015 – 8 ICU-acquired CLABSIs
• Review of events by IPC Nurse and ICU Nurse Clinician revealed:
  – One positive and one negative blood culture in 5 CLABSIs (63%)
  – 3 of the 5 (60%) positive cultures were drawn from central lines
• Literature review completed – venipuncture only blood cultures due to a high incidence of false positives from luminal biofilm
Practice Change

• Findings reviewed with ICU Medical Director, Laboratory Services, and ICU Nurse Practice Committee – Supported and approved venipuncture only blood cultures

• In September 2015, venipuncture only blood cultures implemented in ICU – No CLABSIs since
  – As of November 14, it has been 809 days since the last ICU-acquired CLABSI

• In March 2016, practice spread throughout St. Cloud Hospital and CentraCare Health – 20% reduction in CLABSIs
Outcomes

Central Line Associated Blood Stream Infections
Infections/1000 Catheter Days

- CHG Bathing Implemented
- Venipuncture Only Blood Cultures

CLABSI/1000 cath days
Linear (CLABSI/1000 cath days)
Questions?
Hospital Highlight – Mayo Clinic, Rochester

Presenters:

- Priya Sampathkumar, MD, FIDSA, FSHEA
  - Associate Professor of Medicine
  - Division of Infectious Diseases
- Jean Barth, MPH, RN, CIC
  - Director of Infection Prevention and Control
CLABSI REDUCTION AT MAYO CLINIC
MAYO’S APPROACH

PROJECT GOAL
Reduce and maintain central line associated blood stream infections (CLABSIs) at less than the Value Base Purchasing (VBP) achievement threshold.

PROJECT SCOPE
Who: All inpatients in Rochester MN
What: Central Lines, Arterial Lines, Midline Catheters
includes line selection, insertion and maintenance of lines

COUNTER MEASURE
While being more diligent in line assessment and removal, we do not want to increase line re-insertion rates.
DMAIC DESIGN

DEFINE  MEASURE  ANALYZE  IMPROVE  CONTROL
DEFINE

- Develop Project Charter
- Identify and Engage Stakeholders
- Develop Project Timeline and Milestones
- Form Workgroups
IDENTIFY AND ENGAGE STAKEHOLDERS

- Infection Prevention and Control
- Administration
- PICC Team
- Anesthesiology
- Internal Medicine
- Supply Chain
- Hematology And BMT
- Pediatrics (PICU/NICU)
- Pulmonary Critical Care
- Respiratory Therapy
- Nursing Administration Clinical Nurse Specialist Education Floor
- Media Services
IDENTIFY CENTRAL LINE LIFE CYCLE

SELECT THE RIGHT LINE

INSERT LINE CORRECTLY

MAINTAIN LINE

REMOVE LINE WHEN NO LONGER NEEDED

FORM WORKGROUPS

LINE SELECTION/ORDERING

INSERTION

MAINTENANCE AND ACCESSING

ASSESSMENT AND REMOVAL
DMAIC DESIGN

DEFINE  MEASURE  ANALYZE  IMPROVE  CONTROL
<table>
<thead>
<tr>
<th>Quality Tools Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Surveys</td>
</tr>
<tr>
<td>• Process mapping</td>
</tr>
<tr>
<td>• Direct observations</td>
</tr>
<tr>
<td>• Chart audits</td>
</tr>
<tr>
<td>• Interviews &amp; focus groups</td>
</tr>
<tr>
<td>• Affinity diagrams</td>
</tr>
<tr>
<td>• Fishbone Diagrams</td>
</tr>
<tr>
<td>• 5 Whys</td>
</tr>
<tr>
<td>• Plan Do Study Act (PDSA’s)</td>
</tr>
</tbody>
</table>
EXAMPLE - PROCESS MAPPING Line Maintenance

Pt. 10

Consent (by fam, pt., or provider in emergency)

PICC by PICC team
(2 RNs) - 3, 6, 9
- more efficient
- better practice
- non-stick

Assess vein

Lidocaine 1:
- Prep wire + needle
- Insert needle, US onsite
- Guide en-US
- Peel off guide

Doc. - place catheter

PM/NS

Insert wire

Disengage pack

Take needle off wire

Flexible "basket" wire

Remove dilator + wire

Infuse medication (catheter)

Infection loop

Remove PICC

Right CVC (bogeymen)

Clot

Remove intubation catheter

Pitch to ET

Carry in PICC kit

Complications

PICC thrombosis to PE

Microembolism
EXAMPLE – 5 Whys & Root Cause Analysis
### Example of Findings from Analysis

<table>
<thead>
<tr>
<th>Line Selection and Ordering</th>
<th>Insertion</th>
<th>Line Maintenance and Accessing</th>
<th>Line Assessment and Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Midlines underutilized</td>
<td>• Insertion was done well overall</td>
<td>• Hand hygiene issues</td>
<td>• Needs assessment performed inconsistently</td>
</tr>
<tr>
<td>• Potential for reduction of triple lumens</td>
<td>• Variation in supplies</td>
<td>• Dressing disruption</td>
<td>• Lines left in longer than ideal</td>
</tr>
<tr>
<td></td>
<td>• Procedure interruptions</td>
<td>• Variation in supplies</td>
<td>• Formal policy and procedure does not exist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Procedure interruptions</td>
<td></td>
</tr>
</tbody>
</table>
Procedure in Progress
Please Do Not Enter
DMAIC DESIGN

DEFINE  MEASURE  ANALYZE  IMPROVE  CONTROL
Developed CLABSI Bundles of education by audience:
- Nursing
- Physician
- Patient

Interventions categorized into the following areas:

- Supply
  - Transition to CHG impregnated dressing
  - Include more sterile syringes in insertion kits
  - Minimize supply and use of non-CHG coated lines

- Education
  - Nursing
  - Physician
  - Patient

- Policy and Process
  - Develop general principles for Needs Assessment
  - Develop algorithm decision process
  - On-call SME to support PICC team calls
  - Establish line ownership

- Systems

Change PICC order screens
DMAIC DESIGN

DEFINE > MEASURE > ANALYZE > IMPROVE > CONTROL
## CONTROL – MAINTAIN GAINS

<table>
<thead>
<tr>
<th>STRATEGY</th>
<th>TASKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Develop control plan</td>
<td>• Develop a map and cadence for ongoing system checks</td>
</tr>
<tr>
<td>• Practice good change management</td>
<td>• Identify indicators/red flags that warrant a review of an issue</td>
</tr>
<tr>
<td>• Identify and empower operational owners</td>
<td>• Who is responsible to initiate?</td>
</tr>
<tr>
<td>• Ongoing Metrics</td>
<td>• Continued education and communication</td>
</tr>
</tbody>
</table>
QUESTIONS AND DISCUSSION
Resource Review
New additions to HAI resources!

CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS (CLABSI)

Central line-associated bloodstream infections (CLABSI) are serious infections that can result in longer hospital stays, increased costs and increased risk of death. These infections are among the most deadly types of healthcare-associated infections with a mortality rate of 12 percent to 25 percent. Experts estimate that the average cost of care for a patient with CLABSI is $45,000 with an estimated $2 billion annual cost to the U.S. health care system.

Great strides have been made in U.S. hospitals to prevent CLABSI in the intensive care unit (ICU) with the use of proper techniques to insert and manage the central line. There is room to strengthen CLABSI prevention outside of the ICU, however. The Centers for Disease Control and Prevention estimate that 32 percent of CLABSI in hospitals occur outside of the ICU.

Download the CLABSI road map.

The CLABSI road map covers central line insertion, maintenance and monitoring, and is intended to be used in all patient care areas in acute care hospitals. The CLABSI toolkit below is a collection of supporting documents, resources and tools to assist hospitals in implementing the bundle.

For more information, contact the MHA quality and patient safety team.

CVC Care and Maintenance Processes

- The Joint Commission CVC Maintenance Bundles
- The Joint Commission Daily Central Line Maintenance Checklist Template
- IPRO Central Line Maintenance Bundle
- AHRQ Central Line Maintenance Audit Form
Blood Cultures Contamination: Background & Scope

- Blood culture: gold standard for detection of bacteremia

- Contamination of blood cultures (i.e., false-positive) is common
  - Occurs from the introduction of organisms outside the bloodstream (e.g., skin or environmental contaminants)
  - Estimated that 20-50% of all positive blood cultures are contaminated [1]
  - Reported contamination rates in hospitals vary widely (0.6% to 12.5%), highest in ED [1]

- Number of hospital stays for septicemia more than doubled from 2000-2009 [2]

- Negative consequences associated with false-positive blood cultures:
  - Interference with clinical decision-making
  - Unnecessary antibiotic use, increased pharmacy costs
  - Additional laboratory tests, increased lab costs
  - Infection control considerations (e.g., isolation)
  - Increased length of hospital stay
  - Infection surveillance estimates – hospital, public health

Strategies for Reducing Blood Culture Contamination

- Strategies for reducing blood culture contamination:
  - Trained phlebotomy/blood culture teams
  - Blood culture kits / prepackaged prep kits
  - Source of culture (catheter, vein)
  - Use of sterile gloves, aseptic technique
  - Skin preparation
  - Needle exchange systems
  - Culture bottle preparation
  - Initial specimen diversion devices
  - Appropriate blood culture testing/utilization

- Microbiology reports useful (Do some units, services have higher contamination rates vs others?)
Blood Culture Collection

Recommendations

- Maintain blood culture contamination rate <3% [1,2]
- Where available, **phlebotomy team** should draw the blood samples for culture [3]
- **Skin preparation** for percutaneously drawn blood samples should be carefully done with either alcohol or tincture of iodine or alcoholic chlorhexidine (>0.5%), rather than povidone-iodine; allow adequate skin contact and drying time to mitigate blood culture contamination [3]
- If a blood sample is obtained through a catheter, **clean the catheter hub** with either alcohol or tincture of iodine or alcoholic chlorhexidine (>0.5%) and allow adequate drying time to mitigate blood culture contamination (A-I). [3]
- For suspected CRBSI, **paired blood samples** drawn from the **catheter** and from a **peripheral vein** should be cultured before initiation of antimicrobial therapy, and the bottles should be appropriately marked to reflect the site from which the cultures were obtained [3]
- If a blood sample for culture **cannot be drawn from a peripheral vein**, it is recommended that ≥2 blood samples should be **obtained through different catheter lumens**. It is unclear whether blood samples for culture should be obtained through all catheter lumens in such circumstances [3]

Obtaining Blood Cultures by Venipuncture versus from Central Lines: Impact on Blood Culture Contamination Rates and Potential Effect on Central Line–Associated Bloodstream Infection Reporting

John M. Boyce, MD; Jacqueline Nadeau, M(ASCP); Diane Dumigan, RN; Debra Miller, RN, CMSRN; Cindy Dubowsky, MS; Lenore Reilly, RN, MS; Carla V. Hannon, RN, MS

http://www.jstor.org/stable/10.1086/673142
Overview of Study

- **Background:**
  - Blood cultures obtained from catheters have a higher contamination rate compared to cultures obtained via venipuncture
  - Better aseptic technique for obtaining blood samples for culture could lower the number of reportable CLABSI cases

- **Goal:** implement strategies to minimize number of blood samples drawn from catheters

- **Objective:** evaluate impact of reducing the use of catheter-drawn blood samples for culture on blood culture contamination rates and its possible contribution to reducing number of reportable CLABSI cases

- **Results:** combination of measures resulted in a progressive and sustained reduction in blood culture contamination rate from 1.6% to 0.5% for all hospital units (excluding ED, NICU)
Implementation

**Policy:** recommended drawing blood samples for culture by venipuncture whenever possible and avoiding the use of catheter-drawn blood samples unless absolutely necessary

- Physicians required to obtain permission from hospital epidemiologist to have blood samples drawn for culture from central catheters unless patient was febrile and neutropenic or required hemodialysis

**Education:** new policy; reeducated about aseptic technique and skin antiseptic application time and dry time required

**Procedure:** nursing wrote procedure designed to minimize contamination of blood specimens drawn from central catheters when phlebotomists or IV team unable to obtain by venipuncture

- Two nurse-procedure: one obtained specimens, one monitored procedure using checklist

**Standardized supplies:** nursing developed a special kit (Table 1 in article)
Implementation (cont.)

- **Communication**: memo sent by Chief Medical Officer to all medical staff

- **Leveraged EHR and incorporated into workflow**: At the time blood samples were obtained for culture, physicians prompted to enter whether the blood was drawn from a central line or from other sites (peripheral vein or A-line)
  - If a blood sample could not be obtained by venipuncture, then the protocol required that the order be cancelled and a new order placed for blood culture samples to be drawn from a catheter

- **Tracked compliance**: micro lab developed a monthly report:
  - Number of blood culture samples drawn on all hospital units
  - Proportion of blood cultures with samples drawn from central lines vs other sites
  - Presented to the CLABSI committee
Study Results

- Impact of implementing venipuncture policy:
  - Significantly reduced the proportion blood culture specimens drawn from central lines (from 10.9% to 0.4%)
  - Blood culture contamination rate decreased from 1.6% to 0.5%
  - Requiring permission from hospital epidemiologist to draw blood culture specimens from catheter served as a significant barrier to physicians ordering cultures of blood specimens drawn from catheters
  - Limiting number of blood culture specimens obtained from central lines contributed to reducing blood culture contamination rate
MHA HAI Updates
HAI Road maps now available in PDF and in data portal!
Road Map Overview

Organized by section to address specific aspects of care

<table>
<thead>
<tr>
<th>Road map sections</th>
<th>Road map questions (if not present at your hospital or answering no, please see next column for suggested resources)</th>
<th>If specific road map element is missing, consider the following resources:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient &amp; family education</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Consider the following examples of patient education when developing teaching materials:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- MHA Checking CLABSI patient education sheet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Centers for Disease Control fact sheet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The Ohio State University Wexner Medical Center CVC sterile dressing change patient education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Institute for Healthcare Improvement (IHI) “Always use teach back” tools were developed to assist in confirming patient understanding of care instructions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

 Fundamental or advanced strategies to help with prioritization

Audit-style format for key elements

Operational definitions (what yes means)

Line by line references (active links at the end of each document)

Mapped resources with live links
Road maps available on the MHA website!

http://www.mnhospitals.org/quality-patient-safety
HAI road maps in the MHA Data Portal

Current Hospital:

- Minnesota Hospital Association - Saint Paul

Choose a Road map
- CAUTI Road Map
- CLABSI Road Map
- SSI Road Map
- VAE Road Map
- CDI Road Map

Select question type

Analyze Road map
Next HAI Peer Learning Network Event

NO HAI LN Event in December 2017

2018 HAI Learning Network Kickoff
Thursday, Jan. 23, 2018
1:00 - 2:00 pm

Registration link:
https://web.telspan.com/register/240mnhospitals/haijan18
Questions?

Susan Klammer
Quality & Process Improvement Specialist
651-603-3529
sklammer@mnhospitals.org

Lindsey Lesher Erickson
Consultant HAI Epidemiologist
lerickson@mnhospitals.org

Nancy Miller
Program Manager - HIT/Care Coordination
Stratis Health
nmiller@stratishealth.org