Catheter and Bundle: Is Your Team Complete?

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Date: October 26, 2018
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Past clinical experience includes Medical Surgical, Emergency Department, Intensive Care Units, and supervisor & leadership roles. Graduate degree in nursing with a specialty track of Nursing Education. Currently supervise a rapid response team and a vascular access team in a 450 bed acute care facility in Alabama. Currently using my clinical trial experience to share with others good outcomes and EBP.

Marguerite Naseau Core Values Award 2012 – Creativity

• Initiated an in-house vascular access team
• ABN provider of CEU material rt/vascular access
• Developed specific EMR charting for special teams
• Established an Outpatient service for line placement and other services
• Construct and write skill specific policies for vascular access
• Initiate and present Alabama Board of Nursing applications for procedures beyond basic nursing preparation
Disclosure

• Consultant for Teleflex Medical

• I will not discuss off label use
Learning Objectives

• Review the science behind how infections occur with a bundle.

• Identify how passive protection completes the team.

• Discuss a personal experience of adding a protected catheter to an existing insertion bundle practice.
Catheter and Bundle Journey
Clinical Team Approach

- Interdisciplinary Team
- Key Leader or Champion
  - Vascular access team
  - Infection control leaders
  - Administrative support
  - Infection disease physicians
  - Champion or key leader for outcomes
Gap Analysis: Preventative and Aids In Identifying Cause

- Extensive Consultation Process
- Evidenced Based Practice
- Current Effort of CLABSI Reduction

Gap Analysis
**Bundles and Solutions**

- Maximal Barrier Insertion Bundles
- CUSP Initiatives
- Central Venous Line (CVL) Carts
- Personal Protective Equipment (PPE)
- Central Line Insertion Practices (CLIP) forms
- Antimicrobial Catheter
What is “All we could do”? 

- Team approach
- Educate all staff – hands on & didactic
- 2 person team – empowered VAS
- Incorporation of EBP
- VAS perform weekly dressing changes
- Daily assessment of all lines by expert
- Yearly assessment of VAS clinicians
- Data Collection
**Remarkable Results = Improved Patient Outcomes**

**Timeline**

- **2016 (6 Months)**
  - Number of Catheter Days: 10332
  - Number of CLABSIs: 20

- **2017 (6 months)**
  - Number of Catheter Days: 10222
  - Number of CLABSIs: 6

*Results represent the use of the bundle, care and maintenance education, post insertion education, and antimicrobial catheter feature.*
**Additional Impact / Organism Specific**

2016 Pre-Intervention:
- 7 CLABSIs
- *Candida* Species

2017 Intervention Period:
- 0 *Candida* CLABSIs

Continued Results:
- *Candida* CLABSI Free

*Results represent the use of the bundle, care and maintenance education, post insertion education, and antimicrobial catheter feature.*
Impact of Reducing Candida

Candida CLABSIs Reduction = 7

Cost to Treat $79,508\textsuperscript{24}

Total Cost to Treat $556,556

Candida Mortality Rate 38%\textsuperscript{23}

3 Potential Mortalities Avoided

*Results represent the use of the bundle, care and maintenance education, post insertion education, and antimicrobial catheter feature
What Gaps exist in the modern bundles? Let’s evaluate the missing pieces.
Central Line-Associated Bloodstream Infection Costs

250,000 CLABSIs occur in the US each year
80,000 in ICUs¹

20% of CLABSI incidents result in a mortality²

The CDC estimates the annual cost of CLABSI is more than $1 Billion²
Winning with a Multi-Faceted Approach

(CDC) Recommendations

Michigan Appropriateness Guide for Intravenous Catheters (MAGIC)

Infusion Nursing Society (INS)

Institute for Healthcare Improvement (IHI)

Pennsylvania Patient Safety Authority (PPSA)
Why Do Catheters Cause Infections?

Key Elements:

• Nutrition
• Surface for attachment
• Minimal competition
• Time (24 hours)
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Next Step: Surface Colonization
- Biofilm formation
Creating a Gold Medal Team

- Cap
- Mask
- Gown
- Maximal Barrier Drape
- 2% Chlorhexidine Prep
- Antimicrobial Disk
- Antimicrobial Luer Caps
- Antimicrobial Catheter¹
Contamination Happens

- Patient Skin Microflora
- Patient Hair Follicles
- Poor Penetration by Skin Prep
- Medical Personnel Gloves
- Hematogenous Seeding
- Guidewire
- Hub Colonization
Colonization Starts with Contact
Extraluminal Colonization
Intraluminal Colonization
Active Solutions to Reduce Colonization

- Maximal Barrier Precaution
- Antimicrobial Dressings
- Skin Prep

- Antimicrobial injection caps
- Proper Care and Maintenance
- Lock Solutions

Potential for human error!
Passive Solution to Reduce Colonization

Protection without intervention

- Antimicrobial Catheters

Extraluminal/Intraluminal*

* and/or
Clinical Trial Evidence: Antimicrobial Catheters

- Rupp et al. 2005
- Lorente et al. 2014
- Wang et al. 2018
Antimicrobial Efficacy of Antimicrobial Catheters
The Bundle Needs a Goalie!

Active Solutions

Passive Solution

Opportunity for errors

Prepping
Maximal Barrier
Care and Maintenance
Dressing and Caps
Antimicrobial Catheter

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Conclusion

- Team approach
- Catheter colonization
- Active vs. passive solutions
- Insertion bundle and antimicrobial catheter evidence
- Commitment to look
  - If not all protected, ask why not?

Ask, what would the patient choose for themselves?
References

10. Data on File.
References (cont.)


Any Questions?
Thank You