Evidence Based Practice for CVC and PIV Infection Prevention in the Emergency Department

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History

• 2012 - Original Survey and Education Project initiated
  – Infection control committee observing colleagues not adhering to EBP guidelines in ED
  – Policy issues
  – Move to new facility – Project never completed

• 2014 - Needs Assessment Survey
  – CVC and PICC Line Management
  – Renewed interest to complete old project

EBP Project

• Purpose
  – To explore how well Emergency Department (ED) RNs know and apply EBP guidelines in preventing infections associated with peripheral and central venous catheter access.
EBP Project

• **Design**
  – This EBP project explores how well nurses know and apply EBP guidelines in preventing infections associated with peripheral and CVC access through a pre and post survey of registered nurses in an urban Level II academic center Emergency Department.

• **Setting**
  – 60-bed urban Level II academic center ED in Chicago serving an average of 65,000 patients a year.

• **Participants**
  – Registered nurses of an urban Level II academic center ED in Chicago.
Methodology

• Convenience sample of RNs
• Voluntary Participation
• Institutional IRB approval obtained
• The nurses were given pre and post surveys evaluating their knowledge regarding EBP infection control guidelines.
  – Education Sessions held in between surveys
  – Education materials placed in highly visible areas
Delahanty and Myers

• National studies in 2006 and 2009
  • Survey of 3,278 nurses (2006) on evidence-based infection control practices and 562 Nurses in 2009

• 18 questions
  • PIV and CVC infection control
  • Demographics

• Results published in Nursing 2009
  • Not a peer reviewed journal, but important nonetheless
Sample Questions from Survey

1. When you disconnect an intermittent or continuous administration set, what do you do with the set while not in use?
   1. Place a new dead end cap on the male luer end
   2. Place a new capped needle on the male luer end
   3. Place nothing on the male luer end
   4. Attach the male luer end to an injection port on the same tubing

2. When CVCs are being inserted, what percentage of the time does staff use maximal barrier precautions (sterile gloves, and gowns, large sterile drapes, caps, masks)?
   1. Less than 25% of the time
   2. 25% - 50% of the time
   3. 51% - 75% of the time
   4. 76% - 100% of the time

3. According to CDC guidelines, the best skin preparation to use before insertion of a central or peripheral IV catheter in adults with no allergies is:
   1. Povidone-Iodine (Betadine)
   2. Povidone-Iodine and alcohol
   3. Chlorhexidine gluconate (CHG) with alcohol
   4. Alcohol alone
   5. Alcohol and zinc pyrithione (Triseptin)
Instrument and Analysis

• Modified Delahanty & Myers Survey Tool
  – 12 questions with multiple choice answers including 3 demographic questions that pertain to years of experience, education level and age
  – Permission was obtained from Delahanty and Myers for utilization of this instrument in the ED survey

• Survey Monkey link created
  – Distributed to staff via Institutional Email
  – Comparison of Pre and Post Survey results

  • Post-survey after Education Sessions
Staff Education

• 45-minute Education Session
  – 0.75 CEUs awarded
  – Objectives
    • Apply current CDC guidelines for prevention of CVC and PIV associated bloodstream infections
    • Compare CVCs and PICCs
    • Apply CVC and PICC management principles
    • Demonstrate CVC/PICC line dressing change

• Education Poster Board
  – Placed in break room
  – Included Answers and Rationale to survey questions
Education Sessions

• 35 nurses attended
  – Logistical issues

• Positive Response
  – Most ED nurses don’t routinely encounter CVCs
  – Nurses from other areas (ICUs) seemed well versed
    • Resource for RNs in the ED
Survey Results

ED Experience (Years)

Pre n – 31
Post n - 25

Nursing Education Level

Pre - 31
Post - 25

ADN
BSN
MSN

0-5 yrs
6-10 yrs
11-15 yrs
16-20 yrs
21-25 yrs
26-30 yrs
30-35 yrs
> 36 yrs
Survey Results

Maximal Barrier Precautions with CVC Insertion

% Compliance Observed

Antimicrobial Ointments Reduce CVC Infection Rates

Survey Results

When to Change C/D/I Transparent CVC Dressings

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every 2 Days</td>
<td></td>
<td></td>
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<tr>
<td>Every 5 Days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Every 7 Days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With Catheter Change</td>
<td></td>
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</tbody>
</table>

Disconnecting Infusion Sets

<table>
<thead>
<tr>
<th>Action</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Dead End Cap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Capped Needle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attach to Injection Port</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What do you do with the set while not in use

[Image of a dead end cap](http://www.medicalrite.com/dead-end-cap-male-female-luer-non-vented-sterile-bag-100.html)
Room for Improvement

Confidence with Answering the Questions Correctly

- Scale 5 (Very Confident) - 1 (Not Confident)

Infusion Therapy Theory and Supervised Clinical Practice in School

Frequency of Infusion Therapy Training

- Pre
- Post

- Annual
- Every 1-3 yrs
- Sporadically
- Never

Yes
No
Unsure
Future Considerations

• We need more training!!!!
  – Annual training and competency

• Policy Review
  – Some inconsistencies and out dated policies
Questions?

Thank you to:
Dr. Ruth Kleinpell
Marites Gonzaga-Reardon, MSN, CCNS-BC, CEN
References


