THE JOURNEY TO CLINICAL INDICATION:
TIME TO MOVE THE NEEDLE

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Clinical process gives way to outcomes and efficiency over time as the model becomes more Pay for Performance.

The Affordable Care Act
Value Based Purchasing Timeline

<table>
<thead>
<tr>
<th>FY 2018 Value Based Purchasing Domains*</th>
<th>Baseline Period</th>
<th>Performance Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Process of Care</td>
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<table>
<thead>
<tr>
<th>Device</th>
<th>All studies</th>
<th>Studies requiring microbial concordance between catheter and blood cultures</th>
<th>Studies requiring microbial concordance and all devices cultured</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of studies</td>
<td>IVD-related BSIs per 1000 IVD-days (95% CI)</td>
<td>No. of studies</td>
</tr>
<tr>
<td>Peripheral IV catheters</td>
<td>10</td>
<td>0.5 (0.2-0.7)</td>
<td>9</td>
</tr>
<tr>
<td>Midline catheters</td>
<td>3</td>
<td>0.2 (0.0-0.5)</td>
<td>2</td>
</tr>
<tr>
<td>Arterial catheters for hemodynamic monitoring</td>
<td>14</td>
<td>1.7 (1.2-2.3)</td>
<td>11</td>
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<tr>
<td>Peripherally inserted central catheters</td>
<td>15</td>
<td>1.0 (0.8-1.2)</td>
<td>5</td>
</tr>
<tr>
<td>Noncuffed central venous catheters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonmedicated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nontunneled</td>
<td>79</td>
<td>2.7 (2.6-2.9)</td>
<td>63</td>
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<tr>
<td>Tunneled</td>
<td>9</td>
<td>1.7 (1.2-2.3)</td>
<td>7</td>
</tr>
<tr>
<td>Medicated</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Chlorhexidine-silver-sulfadiazine</td>
<td>18</td>
<td>1.6 (1.3-2.0)</td>
<td>16</td>
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<tr>
<td>Minocycline-rifampin</td>
<td>3</td>
<td>1.2 (0.3-2.1)</td>
<td>3</td>
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<tr>
<td>Pulmonary artery catheters</td>
<td>13</td>
<td>3.7 (2.4-5.0)</td>
<td>11</td>
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<tr>
<td>Noncuffed, nontunneled hemodialysis catheters</td>
<td>16</td>
<td>4.8 (4.2-5.3)</td>
<td>11</td>
</tr>
</tbody>
</table>

*BSI = bloodstream infection; CI = confidence interval; IV = intravenous; IVD = intravascular device.
Guidelines and Standards

CDC- HICPAC 2011

- There is no need to replace peripheral catheters more frequently than every 72-96 hours to reduce risk of infection and phlebitis in adults.
- Replace peripheral catheters in children only when clinically indicated.
- Remove peripheral venous catheters if the patient develops signs of phlebitis.

SHEA 2014

- Peripheral artery catheters and peripheral venous catheters are not included in most surveillance systems, although they are associated with risk of bloodstream infection independent of CVCs.

APIC 2015

- Repeated (PIV) sites may be required for lengthy courses... thus increasing costs
- Superficial phlebitis results in pain, and lack of (PIV) sites can delay treatment and prolong hospitalization.
- Venipuncture has been documented to produce nerve damage, such as complex regional pain syndrome
- Additionally, the vesicant nature of medications can result in necrotic ulcers requiring surgical debridement.
INS Standards of Practice 2016

- Consider monitoring bloodstream infection rates for peripheral catheters, or vascular catheter associated infections (peripheral) regularly
- Use the venous site most likely to last the full length of the prescribed therapy
- Make no more than 2 attempts at short peripheral intravenous access per clinician, and limit total attempts to no more than 4
- Use a new pair of disposable, nonsterile gloves in conjunction with a “no-touch” technique for peripheral IV insertion, meaning that the insertion site is not palpated after skin antisepsis
INS Standards of Practice 2016

- Consider increased attention to aseptic technique, including strict attention to skin antisepsis and the use of sterile gloves, when placing short peripheral catheters... contamination of nonsterile gloves is documented.

- Consider the use of maximal sterile barrier precautions with midline catheter insertion.

- For peripheral catheters, consider two options for catheter stabilization: (1) in integrated stabilization feature on the catheter hub combined with a bordered polyurethane securement dressing or (2) a standard round hub peripheral catheter in combination with an adhesive ESD.

Infusion Therapy Standards of Practice, Journal of Infusion Nursing. 2016, V39 (1S)
INS Standards of Practice 2016

- Perform dressing changes on short peripheral catheters if the dressing becomes damp, loosened, and/or visibly soiled and at least every 5 to 7 days.

- Remove the short peripheral catheter if it is no longer included in the plan of care or has not been used for 24 hours or more (V)

- Notify the LIP about signs and symptoms of suspected catheter related infection and discuss the need for obtaining cultures (e.g. drainage, blood culture) before removing a peripheral catheter

- Remove short peripheral and midline catheters in pediatric and adult patients when clinically indicated based on findings from site assessment and or clinical signs and symptoms of systemic complications (e.g.. Bloodstream infection).
Guidelines and Standards

INS Standards of Practice 2016

- Signs and symptoms of complications with or without infusion through the catheter include but are not limited to the presence of (I)

1. Any level of pain and or tenderness with or without palpation
2. Changes in color: erythema or blanching
3. Changes in skin temperature: hot or cold
4. Edema
5. Induration
6. Leakage of fluid or purulent drainage from the puncture site
7. Other types of dysfunction (e.g., resistance when flushing, absence of the blood return)
Moving to Clinical Indication

- Fewer Invasive Procedures
- Improved Patient Experience
- Reduced Material Costs
- Fewer Breaches in Skin
- Increased Nursing Efficiency
- Vein Preservation

Regardless of dwell time, risks are still associated with PIVs
PIVs are the Most Frequent Invasive Procedure¹


60% of first attempts to insert are unsuccessful²

27% of patients endure 3 or more attempts²,³

57% of RNs report that they were not taught how to insert PIVs during nursing school⁴

Cultivating Clinical Competencies

INS Safety Practice Survey 2013

“Were you taught to insert short peripheral IV catheters while in school?” (N=344)

- 43% Yes

“If no, how did you learn to insert short peripheral IV” (N=235)

- On-the-job training: 71%
- See one, do one: 11%
- Trial and error: 5%
- Attended a PIV insertion workshop: 9%
- Other: 4%

Methodist Hospitals, NW Indiana

- **Background**
  - 674 beds
  - Previous standard of care for PIVs
    - Routine replacement every 72-96h
    - Transparent film and tape dressings
    - Basic PIV policy not reflective of recent guideline updates
  - 13 years of PIV related LC-BSI data
  - Fall 2013 infection cluster
Building the Case for Clinical Indication

Benefits of Longer Dwell

Fewer Invasive Procedures

Increased nursing efficiency

Fewer breaches in skin

Reduction in material costs

Improved patient experience

Vein preservation
Starting the Journey

All interested parties
- Nursing, IR, Anesthesia, Pharmacy…

Applicability
- All inpatients vs. select populations
- All clinical units vs. select locations

Timeline

Policies, materials, education…

Support systems
Materials/Equipment

- **Efficacy and Durability**
  - Is the dressing going to hold?
  - Is a stabilization dressing or device needed?
  - Does the policy reflect what to do when the dressing is loose
    - (ie; avoidance of tape reinforcements)

- **Protection from bacterial re-colonization**
  - A proven BSI reduction strategy
  - A multi-faceted approach
Creating a Bundle

- Policy, Practice and Materials
  - 2011 CDC Guidelines and INS Standards of Practice
    - Insertion, care and maintenance
    - Dwell time & removal guidelines
  - Best Practices and Process Improvements
    - “No touch” after prep or use sterile gloves
    - Closed system IV catheter
    - Protective disk with CHG*
    - Securement dressing
    - Alcohol impregnated caps on all lines
    - Replacement when clinically indicated

*Consult device Instructions for use when determining maximum length of time between dressing changes
Bolstering Best Practices

Education and skill building
- All clinicians, all units
- Targeted product in-services
- “IV Basics” classes
  - Device, site & gauge selection
  - Strict adherence to site prep protocol
  - Application and dry time
  - “No Touch” or sterile gloves for palpation after prep
  - Application of protective CHG disk, securement device & dressings
  - Meticulous hub hygiene
Protected Clinical Indication

• What are you doing for the PIVs that are staying in longer than 72 hours to reduce bacterial recolonization of the skin?

• It’s up to you to decide what fits best in your hospital’s protocol
  • Look at product indications
  • Look at the evidence

Pre-Prep
Bacteria colonies exist not only on the surface, but below the surface as well, particularly within the hair follicles and sebaceous glands.

Post-Prep
(immediately following antiseptic application)
Prepping the skin reduces colony counts of bacteria from the surface only — it never completely disinfects the skin.

Post-Prep
(within 1-2 days following antiseptic application)
Resident bacteria begin to re-colonize the skin surface.
Post- Implementation

➢ On-going Clinician Assistance
  - Internal
  - External/vendor

➢ Surveillance\(^1,2,3\)
  - What will be monitored?
  - Frequency?
  - Who is responsible?
  - How will the data be used?

3. Infusion Therapy Standards of Practice, Journal of Infusion Nursing. 2016, V39 (1S)
Methodist Hospitals
1 Year Post Implementation

- 37% Reduction in House-wide LC-BSIs
- 19% Reduction in PIV related BSIs
- 48% Reduction in PIV Kit usage
- 75% Reduction in CLABSIs (68% Fewer CLABSIs compared to NHSN prediction)

Reduced IV “sticks”
Positive patient feedback
Positive staff feedback

Methodist Hospitals

2 Year Post Implementation

37% Reduction in House-wide LC-BSIs

sustained

25% Reduction in PIV related BSIs

6% further reduction

75% Reduction in CLABSIs

(68% Fewer CLABSIs compared to NHSN prediction)
sustained

DeVries, M. – Oral Abstract, AVA 2016, Orlando, FL
What did we learn about the infections?

Of those (9) that took place 5 days or more after insertion:

- Based on definition:
  - 2 were field starts (policy violation)
  - 1 was likely secondary to a POA UTI, but did not meet CDC definition (surveillance definition)
  - 1 had a POA BSI with the same organism on admission but still positive after 16 days so have to count again (surveillance definition)
What did we learn about the infections?

The remaining 5 (20%):

- 1 started with alcohol and no CHG sponge dressing placed (policy violation, year one)
- 1 with dressing disruption/change at day 5 (hospital wide focus – AC start from ER)
- 1 (day 14) had no documented dressing change (policy violation, year one)
- 2 with no documented problems

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Emergency Room starts

- 10/25 (40%) were initiated in the Emergency Department
- 2 more were field starts (EMS)
- Of those hospital based, 43.5% were started in the ER
- This is a similar ratio to the percent of PIVs overall that are placed in the ER in our hospital
  - Suggesting this may be largely attributed to volume as much as differences in practice
  - Provides opportunity for enhanced focus for this group to see the biggest impact per inserter
- Average from insertion to infection similar between ER and inpatient starts (once one high outlier of 14 days is removed)
  - 3.6 vs. 4.2 days (not significant)
Where do they occur?

**Unit Type**
- MedSurg, 52%
- Step Down, 28%
- ICU, 8%
- Post partum/L&D, 8%
- Oncology, 4%

**Anatomical Location**
- Hand, 35%
- Forearm, 31%
- Wrist, 11%
- Antecubital, 19%
- EJ, 4%
Failed IVs

- 5/25 (20%) had 5 or more PIVs prior to the bloodstream infection
  - 4/5 (80%) of these took place prior to Day
    - Do we need to expand our definitions/awareness of “attempts” to include serial failed IVs?
    - Early identification and referral to expert team?

DeVries, M. – Oral Abstract, AVA 2016, Orlando, FL
What Have We Learned So Far?

- Despite average dwell time in excess of 4.2 days (range 1-23 days) the majority of infections are occurring on or before day 4
  - Suggesting that avoiding a restart can be a further benefit to reducing infection risk to our patients and that our efforts to reduce the risk in longer dwelling lines has largely been successful
- Remaining opportunities regarding IV starts based on observations
  - Skin prep
  - Dressing integrity
  - Site selection
  - Early identification of need for vascular access consult
Can you measure the impact on patient experience?

Press Ganey:
Top Box: Overall patient satisfaction
Tests and Treatment: Courtesy of the person starting IV

- We hypothesized that overall satisfaction could be improved by improving the overall experience with IVs.
- One year after introducing our protected clinical indication bundle we experienced
  - Increase of 23 percentile ranking improvement with top box
  - 24 percentile ranking improvement with courtesy of person starting IV.
- This suggests an quantifiable association worth further study.

DeVries, M. – Oral Abstract, AVA 2016, Orlando, FL
More things to consider…

• What is the contribution of PIVs to CLABSIs?
  • Pre-implementation of clinical indication: 20% of CLABSIs also have peripheral IVs
  • Year one after implementation: 12% of CLABSIs also have peripheral IVs
  • Year two after implementation: 10% of CLABSIs also have peripheral IVs
What about midlines?

- In an effort to reduce CLABSI incidence many hospitals are looking increasingly to midline catheters as part of their solution.
- Midlines are considered peripheral catheters per INS standards\(^1\) and CDC definitions regarding tip termination.
- How are you protecting your patients with these lines?
  - Insertion? INS says consider maximum sterile barriers.
  - Protection? These lines may dwell for up to 29 days
- How are you measuring success?
  - Decrease in central line days?
  - Decrease in CLABSI?
  - Material costs and time savings?
  - Incidence of Midline associated bloodstream infection?

1. Infusion Therapy Standards of Practice, Journal of Infusion Nursing. 2016, V39 (1S)
To make a large impact, make a small change to the most frequently performed invasive procedure in your institution.