Reducing Risks and Improving Outcomes

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Risks of Peripheral IV Therapy

Peripheral intravenous (PIV) therapy is one of the most frequently performed invasive procedures in hospitals and is associated with many risks:

- Risks to patients due to delays in receiving therapy and to PIV complications such as phlebitis, infiltration, occlusion, dislodgement, and infection
- Risks to the institution in reduced patient throughput and overuse of PIV products and nursing time when resiting of catheters is required before the end of therapy
- Risks to healthcare workers (HCWs) for blood exposure and needlesticks, a key concern at University of Florida Health at Jacksonville (UF), where many patients are HIV or hepatitis C positive

Goals: Reduce Risk, Improve PIV Outcomes

UF implemented an integrated vascular access performance improvement program including performance assessments, policy updates, education, and practice and product standardization that was designed to:

- Improve outcomes associated with PIV therapy
- Reduce risks to HCWs from blood exposure and needlesticks
- Reduce overuse of infusion products
- Increase standardization of infusion practice
- Increase clinical competency to incorporate infusion best practices and improve first-stick success

Project Timeline

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<tbody>
<tr>
<td>Baseline assessment</td>
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<td>Policy update and alignment</td>
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<td>Product selection</td>
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<td>Product and practice training</td>
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<td>New product implementation</td>
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<tr>
<td>Continuing education (CE)</td>
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Pre- and Postprogram Assessments

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<thead>
<tr>
<th>Areas Assessed</th>
<th>June 2014</th>
<th>June 2016</th>
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<tbody>
<tr>
<td>No. of patient care areas</td>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>No. of indwelling IV catheter sites</td>
<td>98</td>
<td>188</td>
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<tr>
<td>Medical chart review</td>
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<tr>
<td>No. of patient records</td>
<td>69</td>
<td>60</td>
</tr>
<tr>
<td>No. of PIVs charted</td>
<td>190</td>
<td>100</td>
</tr>
<tr>
<td>No. of PIV insertions observed</td>
<td>12</td>
<td>15</td>
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<tr>
<td>No. of clinicians interviewed</td>
<td>43</td>
<td>23</td>
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Table 1. Practices, processes, and products were assessed to identify areas of risk that could lead to needlestick injury, blood exposure, bloodstream infection, or other catheter-related complication posing risks to HCWs and patients.

Interventions

Policy Updates

- Adopted policy for PIV catheter site rotation when clinically indicated
- Initiated process improvement project to promote adherence to policies and best practices

Education

- Conducted IV best practice educational programs on associated risk factors for all staff responsible for PIV therapy
- Provided infusion-related CE classes to develop clinician skills and improve first-stick success

Practice Standardization

- Assessed prefilled saline flush protocols and ensured that mix of available sizes aligns with policies and best practices
- Standardized practices related to the use of extension sets and hypodermic products
- Ensured that all HCWs adhere to standardized PIV best practices per UF policies and Infusion Nurses Society (INS) standards

Product Standardization

Standardized product portfolio to include:

- Radiology-specific IVs that allow higher flow rates, reduce force in the vein for computed tomographic (CT) contrast material injection, and optimize image quality
- Catheters with blood control technology and integrated extension sets
- Standardized extension sets from >8 sets to 2 sets
- Catheters with integrated securement
- Standardized skin prep to a CHG/alcohol formulation to align with 2016 INS recommendations
Additional Key Outcomes

Additional key outcomes included the critical reduction to zero of blood spillage and contamination. The reduction in catheters per patient also met a key objective. Improvements in documentation allowed continued monitoring to ensure sustained adherence to policies and best practices.

Blood spillage and contamination

REDUCED TO ZERO

PIV catheters per patient

42% DECREASE

Decreased from 2.75 to 1.6

First-stick success

37% INCREASE

Increased from 42% to 80%

PIV dwell time

79% INCREASE

Increased from 2.4 to 4.3 d

Figure 1. Percentage of successful IV starts requiring one, two, or three attempts. First-stick proficiency increased to 80% by June 2016.

Figure 2. Preprogram dwell times (light blue line) averaged 57.6 h, with 60% of PIVs requiring replacement within 48 h of insertion. Postprogram average PIV catheter dwell times (dark blue line) increased by 79% to 103.2 h, the percentage of catheters failing within 24 h decreased to 9% from 32%, and PIVs requiring replacement by 48 h decreased by 46%.
Conclusions

The vascular access management performance improvement program implemented at UF was effective in improving outcomes associated with PIV therapy. The risk to HCWs from blood exposure was reduced to zero. Standardization of practices through extensive education and the selection of a portfolio of products that support best practices increased clinical competency and adherence to best practices. First-stick success improved, fewer PIV catheters were used, and dwell times increased. These results demonstrate that improving infusion clinical competency in PIV therapy can have significant positive effects on staff, patients, and the institution.

References


Acknowledgements

We gratefully acknowledge the support of clinical specialists from Becton, Dickinson and Company (BD) and FORCE Communications for graphic design support. ©2017 University of Florida Health at Jacksonville.

Outcomes

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<th>2014</th>
<th>2016</th>
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<tbody>
<tr>
<td>PIV dwell time (days)</td>
<td>2.4</td>
<td>4.3</td>
</tr>
<tr>
<td>First-stick proficiency</td>
<td>42</td>
<td>80</td>
</tr>
<tr>
<td>Port protectors on all ports</td>
<td>77</td>
<td>100</td>
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<tr>
<td>Patients requiring new IV on admission from ED</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>Reported percentage of patients requiring &gt;1 attempt for PIV access</td>
<td>50</td>
<td>22</td>
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<tr>
<td>Nonocclusive dressing</td>
<td>18</td>
<td>8</td>
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Table 3. Numerous pre- and postprogram measurements were assessed to gain specific insights into processes and procedures that had improved and to identify areas that needed continued focus.

ED = emergency department; PPE = personal protective equipment.

NOTE: Data in table are percentages, unless otherwise indicated.