Getting to Zero with the Implementation of a Nurse Directed Neonatal Peripherally Inserted Central Catheter (PICC) Team

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SCN PICC TEAM

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Location:
Special Care Nurseries Emory University Hospital Midtown
Bloodstream infection rates had been rising steadily on our unit since 2002, to where by January 2008, our PICC associated bloodstream infection (BSI) rate was 11.8 per 1000 catheter days. Using guidelines provided by the Centers for Disease Control and Prevention (CDC), the Institute for Healthcare Improvement (IHI) and the National Association of Neonatal Nurses (NANN) our unit developed a nurse led neonatal PICC team. Our goal was to eliminate BSI’s primarily associated with our PICC’s.
Process

- Identification and implementation of a Neonatal PICC Team.
- Development and introduction of a PICC Bundle.
- Development of PICC candidate criteria guidelines.
- Unit wide staff education.
- Implementation of 2 Step Prep for dressing changes.
- Use of a dedicated central line cart.
Neonatal PICC Bundle Elements

- Hand hygiene
- Maximal barrier precautions on insertion
- Chlorhexidine skin antisepsis for infants > 27 $^3$ weeks gestational age
- Dressing change every seven days
- Use of a 2% Chlorhexidine sponge on infant > 27 $^3$ weeks gestational age
- Daily PICC assessment
Results

*2% CHG utilized on patients that are \( \geq 27^{3} \) weeks gestation

- Implemented PICC bundle
- Changed to a self-sealing rubber septum lock and luer-threaded cannula
- Staff education
- Two step prep method
- Enrolled in comprehensive unit based safety program CUSP
- 2% CHG for all central line insertions
- Annual staff competency training

#PICC BSI
#PICC BSI/ PICC Days x 1000
## Economic Burden of Sepsis

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual number of PICC Associated BSI in the Special Care Nursery</th>
<th>Cost to the Institution</th>
<th>Potential Savings in Sepsis Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007 (Jan 1\textsuperscript{st} – Dec 31\textsuperscript{st})</td>
<td>19</td>
<td>$475,000</td>
<td></td>
</tr>
<tr>
<td>2008 (Jan 1\textsuperscript{st} – Dec 31\textsuperscript{st})</td>
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<td>$225,000</td>
<td>$250,000</td>
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<tr>
<td>2009 (Jan 1\textsuperscript{st} – Dec 31\textsuperscript{st})</td>
<td>3</td>
<td>$75,000</td>
<td>$400,000</td>
</tr>
<tr>
<td>2010 (Jan 1\textsuperscript{st} – Dec 31\textsuperscript{st})</td>
<td>1</td>
<td>$25,000</td>
<td>$450,000</td>
</tr>
<tr>
<td>2011 (Jan 1\textsuperscript{st} – Aug 31\textsuperscript{st})</td>
<td>3</td>
<td>$75,000</td>
<td>$400,000</td>
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</tbody>
</table>
# Comparison of Neonatal Mortality Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>SCN Neonatal Mortality Rates</th>
<th>State Neonatal Mortality Rates</th>
<th>USA Neonatal Mortality Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>3.63</td>
<td>5.3</td>
<td>4.5</td>
</tr>
<tr>
<td>2006</td>
<td>3.91</td>
<td>5.2</td>
<td>4.5</td>
</tr>
<tr>
<td>2007</td>
<td>3.34</td>
<td>5</td>
<td>4.4</td>
</tr>
<tr>
<td>2008</td>
<td>2.4</td>
<td>Unavailable</td>
<td>4.27</td>
</tr>
<tr>
<td>2009</td>
<td>2.3</td>
<td>Unavailable</td>
<td>4.19</td>
</tr>
</tbody>
</table>
PICC Bundle Compliance

August 2009 - February 2011
Conclusion

- Implementation of our team in June 2008 reduced our rate to 5.63 per 1000 catheter days by July 2009. By July 2010, our rate was again reduced to 1.06 per 1000 catheter days, an overall 90% reduction.
- Practices were standardized to decrease the incidence of PICC associated blood stream infections.
- Maintaining open lines of communication between all team members during the entire project and continuing today has proven invaluable in achieving and sustaining outcomes.
- A dedicated team, a standard for insertion, care and maintenance and having staff and leadership educated and engaged, was and is crucial for sustainment.
- Knowledge and continual review of the evidence is also important, therefore, we participate in a nationwide initiative; On the CUSP: Stop BSI.
- Nationwide about 60% of PICC’s are placed by nurses from more than eighteen hundred nurse-led teams, which raises the question: why not 100%?