Mentored Quality Improvement Impact Project for Insulin Pen Safety

Goryeb Children’s Hospital
Atlantic Health System
Morristown, New Jersey
Suzannah Kokotajlo, Pharm.D., Team Leader
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Team Members

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- Pharmacy members
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  - Christine Robinson, Pharm.D.
- Nursing members
  - Dana Kuber, BSN, RN, CCRN
  - Francis Melchionne, Ed.D., RN, CDE
Goryeb Children’s Hospital

- Member of Atlantic Health System and part of Morristown Medical Center (MMC)
- Consists of
  - 69 inpatient beds
    - 9-bed pediatric intensive care unit (PICU)
    - 26-bed general pediatric unit
    - 34-bed neonatal intensive care unit (NICU)
  - Emergency department
  - Outpatient infusion center

Background and Description

- Insulin pens were previously available for all patients at MMC
- Removed from critical care units in July 2014 due to ISMP reports and recommendations
- Retained only for pediatric patients
  - Required for comprehensive diabetic education for patients and families before discharge
- Despite low-order volume, the use of insulin pens still posed a safety risk to our pediatric patients
- Sought out participation in the mentored quality improvement impact activity to develop a safer practice model
Baseline Data Collection

• Proper storage and labeling of insulin pens at baseline
  – General Pediatrics: 8%
  – PICU: 20%
• Needed to improve labeling procedures in the pharmacy to facilitate proper scanning and administration

Process Improvements

• Initiated “double scanning” procedure
  – Each pen is labeled with a patient-specific label before dispensing
  – Nurses scan both the patient-specific label and the medication barcode before administration
• Compliance was assessed monthly with a goal of > 90%
Example Insulin Pen Labeling

• Visual reference placed on the refrigerator in the pediatric pharmacy satellite

Selected Results: Insulin Injection Observations

• 12 total observations at baseline
  – 9 on the general pediatric floor
  – 3 in the PICU

<table>
<thead>
<tr>
<th>Care Area</th>
<th>Pre-Breakfast</th>
<th>Pre-Lunch</th>
<th>Pre-Dinner</th>
<th>Bedtime</th>
<th>Other</th>
<th>Reported</th>
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<td>9</td>
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<tr>
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<td>0</td>
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<td>3</td>
<td>1</td>
<td>12</td>
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</tbody>
</table>
Selected Results: Insulin Injection Observations

• 12 observations during the post-intervention phase
  – 7 on the general pediatric floor
  – 5 in the PICU

<table>
<thead>
<tr>
<th>Care Area</th>
<th>Pre-Breakfast</th>
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<th>Pre-Dinner</th>
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<tbody>
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<td>General Pediatrics</td>
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<td>1</td>
<td>1</td>
<td>7</td>
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<td>2</td>
<td>1</td>
<td>1</td>
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</table>

Selected Results: Insulin Injection Observations

• Expiration is documented on the label
  – Baseline: 58%
  – Post-intervention: 100%

• Performs proper patient identification
  – Baseline: 91%
  – Post-intervention: 100%

• Scans the patient’s ID band and the insulin pen barcode (prospectively)
  – Baseline: 89%
  – Post-intervention: 90%
Selected Results: Insulin Injection Observations

- Improvement seen with pen labeling and marking of expiration date, as well as patient identification

- Still not at 100% prospective barcode scanning
Selected Results: Pen Storage and Labeling Audit

• 18 pens audited at baseline
  – 13 on the general pediatrics floor
  – 5 in the PICU

• 26 pens audited in the post-intervention phase
  – 18 on the general pediatrics floor
  – 8 in the PICU

Selected Results: Pen Storage and Labeling Audit

• Properly stored AND labeled
  – Baseline: 11%
  – Post-intervention: 81%

• Greatest increase seen in proper labeling, but still room for improvement
  – Baseline: 17%
  – Post-intervention: 81%

Properly labeled = pen labeled, label attached to barrel, and expiration date on label. Properly stored & labeled = active order, storage per policy, and properly labeled.
Selected Results: Nurse Survey

- Baseline
  - Response rate: 10.94%
    - # of responses: 7
    - N value: 64

- Post-intervention
  - Response rate: 18.64%
    - # of responses: 11
    - N value: 59

Selected Results: Nurse Survey

- Improvement in identifying the appropriate steps of insulin pen administration (i.e., how long to hold the pen against the skin before withdrawing the needle)
  - Baseline: 57%
  - Post-intervention: 100%

- Improvement seen in the percentage of nurses who did NOT observe deviations from appropriate insulin administration and storage
  - Baseline: 57%
  - Post-intervention: 73%

- Improvement seen in the number of nurses citing understanding insulin pharmacokinetics/pharmacodynamics as the biggest knowledge deficiency, but a large gap still exists
  - Baseline: 100%
  - Post-intervention: 73%
Lessons Learned

• Importance of sustainability
  – Compliance with double scanning peaked in December and May and has remained high through July
    • Frequent nursing reminders were being sent out during these months
  – Low volume of insulin pen use prevents learning through repetition

• Nurse involvement
  – Low response rate with nursing survey
  – Involving nurses more in the process to provide motivation for improved compliance

Next Steps

• Assessing nursing barriers to double-scanning process
  – Assistance from nursing coordinators, managers, and educators

• Providing weekly updates to nursing personnel on compliance
  – Identified nurses will be counseled appropriately

• Addressing nursing knowledge gap with additional education on insulin timing profile
  – Hang posters in medication rooms

• Continuing regular audits of pharmacy labeling practices