Strategies for Ensuring the
Safe Use of Insulin Pens
IN THE HOSPITAL

Mentored Quality Improvement Impact Project for Insulin Pen Safety

Goryeb Children's Hospital
Atlantic Health System
Morristown, New Jersey

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Team Members

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- Pharmacy members
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- Nursing members
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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

Care Area	Pre-Breakfast	Pre-Lunch	Pre-Dinner	Bedtime	Other	Reported
General Pediatrics	2	3	0	3	1	9
PICU	1	2	0	0	0	3
Total	3	5	0	3	1	12

Selected Results: Insulin Injection Observations

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

Care Area	Pre-Breakfast	Pre-Lunch	Pre-Dinner	Bedtime	Other	Reported
General Pediatrics	1	2	2	1	1	7
PICU	5	0	0	0	0	5
Total	6	2	2	1	1	12

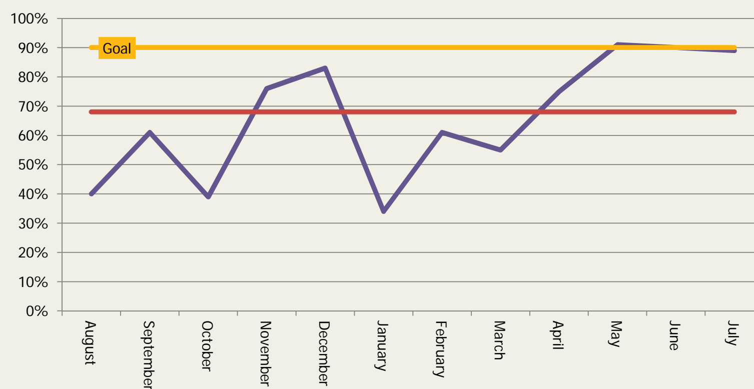
Selected Results: Insulin Injection Observations

- 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

Compliance with Double 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