



*Strategies for Ensuring the*

# Safe Use of Insulin Pens IN THE HOSPITAL

## A Report of Participation in a Mentored Quality Improvement Activity for Insulin Pen Safety

St. Joseph's/Candler Health System  
Savannah, Georgia

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## Team Members

- Team leader
  - Tyler Prieskorn, Pharm.D.
- Team members
  - Carolyn Williams, B.S.Pharm. – Medication Safety Specialist
  - Kimberly Tackett, Pharm.D.
  - Marianne Fields, RN, MSN – Director of Nursing Med/Surg
  - Mary Robinson, RN – Nurse Manager
  - Stacey Peacock, RN – Nurse Manager



## St. Joseph's/Candler Health System

- St. Joseph's/Candler Health System
  - 636-bed, community-based, regional-referral, tertiary-teaching, comprehensive health delivery system

## Background and Description

- Insulin pens at St. Joseph's/Candler
  - Insulin aspart (Novolog), insulin aspart/insulin aspart protamine mix (Novolog 70/30), and insulin detemir (Levemir) formulary insulin products
  - Available in refrigerators attached to automated medication dispensing machines (Pyxis®)
  - Doses verified by two nurses prior to administration
- Participation in Mentored Quality Improvement Impact Activity
  - Evaluate current use of insulin pens in an objective manner to identify areas where improvements can be made
  - Assess the nursing staff's knowledge of insulin and insulin pens
  - Collaborating with experienced mentors

## Baseline Observations

- Insulin pen storage
  - 66 pens from 3 patient care wards
  - 2% of pens properly stored and labeled\*
- Insulin pen administration
  - 15 observations on 3 patient care wards (n = 45)
  - Areas noted for improvement
    - Swabbing insulin pen with alcohol
      - Ward 1 = 47%, Ward 2 = 53%, Ward 3 = 53%
    - Priming insulin pen device
      - Ward 1 = 54%, Ward 2 = 20%, Ward 3 = 60%

\*Properly stored and labeled = active order, storage per policy, pen labeled, label attached to barrel, and expiration date on label.

## Baseline Observations

- Nursing survey
  - n = 17
  - Two questions evaluating knowledge of insulin pharmacokinetics
    - Respondents asked to determine what timeframe a patient is at risk for hypoglycemia following administration of long-acting insulin
      - 12% of respondents answered correctly
    - Respondents asked to determine which situation from 4 choices is likely to lead to a hypoglycemic event
      - 53% of respondents answered correctly
  - One question evaluating knowledge of insulin pen devices
    - Respondents asked to evaluate 5 statements pertaining to insulin pen devices and determine which statements were true (2 of 5 statements were true)
      - 94% of respondents picked true statement # 1
      - 82% of respondents picked true statement # 2

## Process Improvements

- Initiate nursing education
  - Handouts
    - Insulin action-time profiles
    - Proper use of insulin pen devices
  - In-service
  - Posters at Pyxis®
    - Expiration calendar
- Reinforce and develop storage areas
  - Consult with nursing management to store insulin pens according to system policy
  - Conduct random audits as part of floor stock inspections
- Develop policy regarding use of insulin pens (in progress)\*
  - Address correct use of insulin pens
  - Address correct storage and labeling

\*Not completed before post-implementation observations

## Selected Results: Insulin Injection Observations

- Post-implementation observations
  - Swabbing insulin pen with alcohol
    - Ward 1 = 67%, Ward 2 = 85%, Ward 3 = 71%
  - Priming insulin pen device
    - Ward 1 = 73%, Ward 2 = 92%, Ward 3 = 92%
- Change from baseline
  - Swabbing insulin pen with alcohol
    - Ward 1 = 20%, Ward 2 = 32%, Ward 3 = 18%
  - Priming insulin pen device
    - Ward 1 = 19%, Ward 2 = 72%, Ward 3 = 32%

## Selected Results: Pen Storage and Labeling Audit

- Post-implementation observations
  - 67 pens from 3 patient care wards
  - 64% of pens properly labeled and stored
- Change from baseline
  - 62%

## Selected Results: Nursing Survey

- Nursing survey
  - n = 11
  - Two questions evaluating knowledge of insulin pharmacokinetics
    - Respondents asked to determine what timeframe a patient is at risk for hypoglycemia following administration of long acting insulin
      - 64% of respondents answered correctly (52% change from baseline)
    - Respondents asked to determine which situation from 4 choices is likely to lead to a hypoglycemic event
      - 82% of respondents answered correctly (29% change from baseline)
  - One question evaluating knowledge of insulin pen devices
    - Respondents asked to evaluate 5 statements pertaining to insulin pen devices and determine which statements were true (2 of 5 statements were true)
      - 91% of respondents picked true statement # 1 (-3% change from baseline)
      - 55% of respondents picked true statement # 2 (-27% change from baseline)

## Lessons Learned

- Changing established behaviors
  - Difficult if done without explanation
  - Incentivize change
  - How will change improve patient care and safety?
- Never assume
- Provide resources to assist with change
  - Physical resources
  - Electronic resources
  - Personnel
- Maintaining change
  - Reinforce education
  - Periodic reminders
  - Random audits

## Next Steps

- Continue with the development of insulin pen device policy
- Adjust insulin pen label comments with time profiles and expiration dates
- Continue to make pharmacists available on patient care wards



## Mentored Quality Improvement Activity: A Broad View

- Impact of process improvements
  - More consistent storage of insulin pen devices throughout the health system
  - Reduced potential for errors and medication misadventures
  - Increased awareness of the importance of using insulin pen devices correctly
  - Improved knowledge of insulin pharmacology and pharmacokinetics
- Impact of participation in mentored quality improvement activity
  - Eventual development of insulin pen policy
  - Exposure to different ideas to help ensure the safe use of insulin pen devices