

### MEMBERS ONLY ON-DEMAND CE

## USE OF PATIENT SPECIFIC LABELING TO IMPROVE PATIENT SAFETY WITH INSULIN PEN ADMINISTRATION



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### INTRODUCTION

In 1922, Leonard Thompson received a drug called insulin, that would change his life and the life of millions thereafter.<sup>1</sup> While this drug has been associated with tremendous benefit for patients, this highly effective medication has also been associated with numerous errors, resulting in its classification as a high-risk drug. In 2017, ISMP developed a guideline to optimize insulin administration and help decrease risks associated with prescribing, dispensing, and preparing insulin.<sup>2</sup> The use of insulin pens in the inpatient setting has increased due to convenience, ease of use, and the potential for more accurate dosing. It has also helped with transitions of care, as patients can more easily learn how to use the pen prior to discharge. One of the risks associated with using insulin pens, however, is the potential for pen contamination if the same device is used on multiple patients. In 2016, *American Journal of Health-System Pharmacy (AJHP)* published an article on best practices for safe insulin use and recommended that insulin pens be labeled with a patient and product specific label to help ensure that only one pen is used for a single patient.<sup>3</sup>



To mitigate the risk of cross contamination associated with insulin pens, as well as address recommendations made by AJHP, many hospitals worked to develop a solution to the problem. One hospital created a manual process of adding a patient specific barcode.<sup>4</sup> The nurse would navigate to the medication administration record (MAR) and select the “Scan Insulin Pen” button to proceed with the administration process. This allowed the hospital to create specific alerts to help warn the nurse if that specific pen was used on another patient. Many other health-systems are investigating ways to address this issue. EPIC has collaborated with many hospitals, including our organization, to help develop a solution that can be implemented by all its customers. As a result, Patient Specific Package (PSP) labeling was created and became available with the May 2024 EPIC upgrade.<sup>5</sup>

### PURPOSE/PROGRAM GOALS

The goal of the project was to create a process that ensured that each patient received their own insulin pen during administration, thus decreasing the risk of cross contamination.

### DESCRIPTION OF THE PROGRAM SITE

Our organization is composed of multiple hospitals across Chicago and the surrounding suburbs. Our electronic medical record platform is developed by EPIC (Verona, Wisconsin). After many months of preparation, the system went live with PSP labeling on January 28, 2025.

### HISTORICAL WORK

We worked on multiple projects and workflows to decrease the risk of cross contamination. A pilot was done using

EPIC's dispense preparation and check process. The insulin pen label that was printed contained the order identification (ID) number, which confirmed the insulin order, product, and patient it was going to be administered to. The pharmacy staff covered the original manufacturer barcode to prevent the nurse from scanning the wrong barcode during the administration process. One of the disadvantages to the pilot was that it required dispense preparation equipment within non-sterile environments to be set up and proved to be labor intensive for the pharmacy staff. This ultimately prevented its expansion across the system. In addition to this pilot, a MAR flowsheet row was added as nursing acknowledgement to ensure use of the correct insulin pen for the correct patient.

## PSP ADOPTION

When the PSP label process was developed by EPIC, numerous options for implementation were offered, and we were eager to adopt. Nursing and pharmacy leaders were involved to help make the decision on functionality adoption. There were many discussions on whether nursing should add this PSP barcode onto insulin pens on the floor or if the pharmacy staff should be labeling them within the pharmacy. Ultimately, it was decided that the nurse-labeled workflow for our multiple-hospital system was too difficult to adopt, partially because each unit would need its own printer. Therefore, we focused on adopting workflows for the labeling to occur in the pharmacy. EPIC allowed two ways to configure the PSP label; either adding it to the EPIC label or using the generic PSP functionality. Adding a PSP barcode to the EPIC label already associated the barcode to the patient, but still required nurses to associate the specific product. This process also required our EPIC Willow builders to reconfigure labels with limited space based on dispense code. The generic PSP, on the other hand, required nurses to associate the PSP barcode to both the patient and the product. Using the generic PSP would allow for labeling of the pens pre-emptively, as seen in **Figure 1**, as they were printed using the EPIC tool "Print Patient Specific Package Labels." After presenting both options to operational managers and leadership, the hospital system opted for the generic PSP functionality, as it provided a solid foundation for extending to other multidose medications other than insulin. It also aligned better with each hospital pharmacy's workflow, where the pre-labeled pens could be stocked in automated dispensing cabinets (ADC) and dispensed to nurses on the floor, decreasing wait times and preventing delays in care. It also allowed consistency between products being dispensed from the ADC and the pharmacy, as there were different nursing implications and workflows for patient/pen associations. Finally, it alleviated the Willow EPIC team from reconfiguring labels to include a PSP label based on product, leading to less build maintenance.

**FIGURE 1: LABELED INSULIN PEN WITH NURSING WORKFLOW GUIDANCE**



Not only was this an operational change for pharmacists, but a drastic change for our nurses as well. The MAR administration process was adjusted and required a third scan to be considered compliant with barcode-assisted medication administration (BCMA). The nursing team focused on workflow of scanning the patient's wristband first, then the manufacturer barcode, and finally the PSP barcode. These three steps were crucial to help nurses select and associate the medication to the PSP barcode correctly. Education was provided at the high impact nursing committee for months in advance to ensure each nurse understood the new process.

Many alerts were also set up to help with patient safety outcomes. One of the most important alerts set up was the wrong patient's package alert shown in **Figure 2** (on page 24), which notified the nurse that the pen belonged to another patient. A wrong medication alert let the nurse know if the wrong type of insulin was scanned for a particular order. These alerts did not allow a nurse to proceed, therefore improving safety by correcting the action.

## EXPERIENCE WITH AND OUTCOMES OF THE PROGRAM

The transition to PSP labeling occurred January 28, 2025. We began collecting data from February 1, 2025 – May 31, 2025 allowing pharmacy and nursing colleagues to get used to the new operational workflow. During our inclusion period, there were 211,348 insulin

administrations across the system, making it the most used medication across the system. Insulin barcode compliance prior to PSP adoption ranged from 96-97% and simply captured product accuracy during administration. Post PSP implementation, barcode compliance decreased to 81- 87% as complexity of scanning increased, now requiring the patient specific barcode scan. Additionally, as a system, we were now able to collect data on the number of nurses receiving the wrong patient's package scanned alert during the MAR administration process leading to increased safety. Overall compliance within these four months was 84.4%, increasing month to month shown in **Figure 3**. The MAR wrong pen scanned for wrong patient alert occurred 797 times, which is 0.39% of all insulin administrations. In **Figure 4**, alerts per hospital were also assessed and ranged from 0.02-3.7% alerts per administrations. Among 9,928 patients receiving insulin, 452 patients (5%) were prevented from getting another patient's pen. Prior to adopting PSP, any information collected regarding the use of one pen for multiple patients was nursing reported. After go-live, we were finally able to objectively collect and report data regarding this contamination risk. It has helped provide awareness and increased safety among our nursing staff.

## DISCUSSION OF INNOVATIVE ASPECTS OF PROGRAMS AND ACHIEVEMENTS OF GOALS

After the implementation of PSP, the organization is continually working on improvements. There was some confusion and discrepancies regarding the dose on the initial EPIC label for the insulin pen and what was presented on the MAR. The pharmacy team adjusted the labels to include the name of the drug, but removed specific dose, frequency, and due time instructions to help prevent this confusion as one pen is used for multiple orders. To track incorrect associations, a report was created and added as a print group to the order history of the medication; this is frequently used by the pharmacy team to assess association errors and provide further education

FIGURE 2: WRONG PATIENT'S PACKAGE SCANNED ALERT

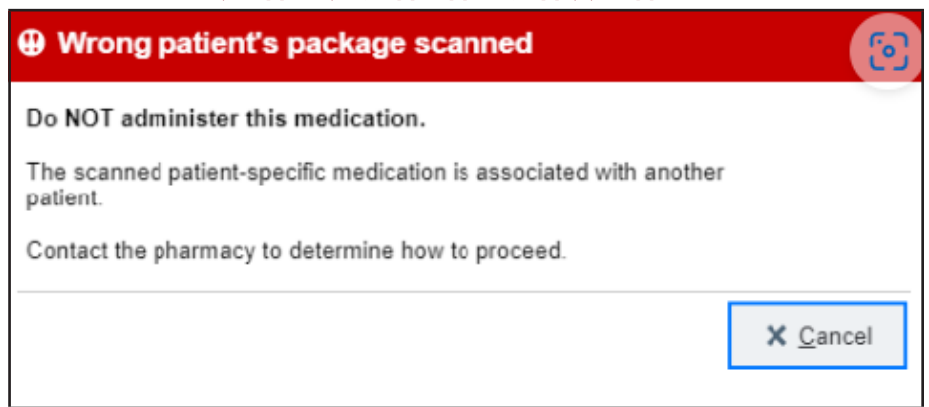


FIGURE 3: INSULIN PEN BARCODE COMPLIANCE PRE/POST PSP IMPLEMENTATION

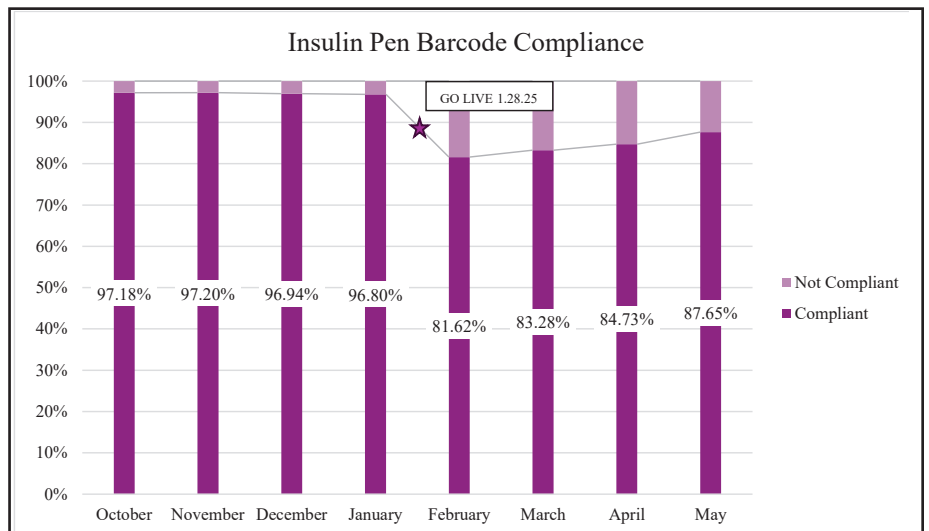
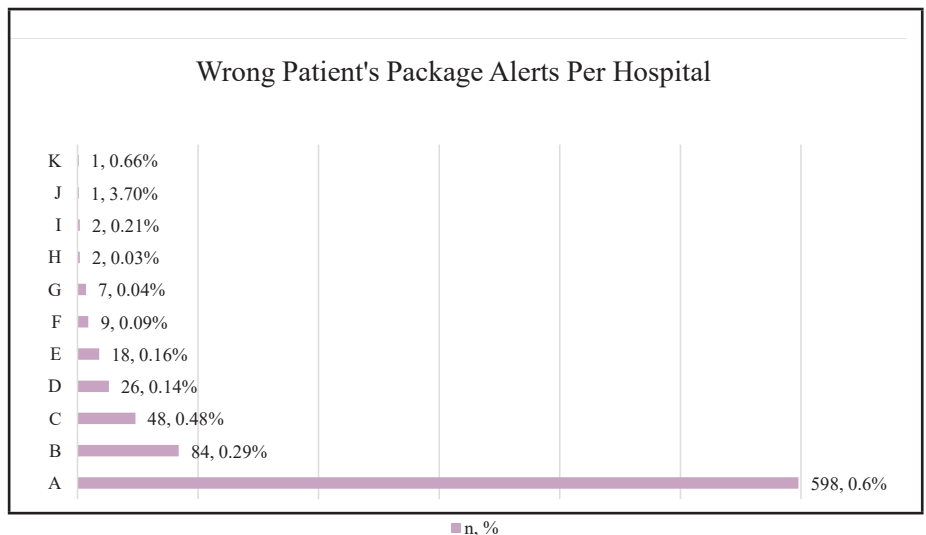


FIGURE 4: WRONG PATIENT'S PACKAGE ALERTS PER HOSPITAL



if needed. We expanded the PSP process and included patients' own insulin pens, keeping the process consistent for any insulin pen.

## CONCLUSION

Adopting the PSP barcode process has increased our safety profile and decreased the risk of cross contamination to 452 patients in our hospital system over four months. The automated process, no longer needing to be manually acknowledged on the medication order, increased nursing satisfaction. Due to the success of this project, many stakeholders are eager to expand this process to other multi-dose products.

## ABBREVIATIONS:

**ADC:** Automated Dispensing Cabinets

**AJHP:** American Journal of Health-System Pharmacy  
**BCMA:** Barcode-Assisted Medication Administration

**EMR:** Electronic Medical Record

**ID:** Identification

**MAR:** Medication Administration Record

**PSP:** Patient Specific Packaging

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## REFERENCES

1. American Diabetes Association. The history of a wonderful thing we call insulin. *Diabetes.org*. Published July 1, 2019. Accessed June 12, 2025. <https://diabetes.org/blog/history-wonderful-thing-we-call-insulin>
2. Institute for Safe Medication Practices. 2017 ISMP guidelines for optimizing safe subcutaneous insulin use in adults. Published May 15, 2017. Accessed June 12, 2025. <https://www.ismp.org/sites/default/files/attachments/2017-11/ISMP138-Insulin%20Guideline-051517-2-WEB.pdf>
3. Haines, S. T., Miklich, M. A., & Rochester-Eyeguokan, C. (2016). Best practices for safe use of insulin pen devices in hospitals: Recommendations from an expert panel Delphi consensus process. *American Journal of Health-System Pharmacy*, 73(19\_Suppl\_5), S4-S16. <https://doi.org/10.2146/ajhp160416>
4. MacMaster HW, Gonzalez S, Maruoka A, San Luis C, Stannard D, Rushakoff JA, Rushakoff RJ. Development and implementation of a subcutaneous insulin pen label bar code scanning protocol to prevent wrong-patient insulin pen errors. *Jt Comm J Qual Patient Saf*. 2019;45(5):380-386.
5. Epic Systems Corporation. Galaxy: Epic UserWeb Resource.Epic. <https://galaxy.epic.com/?#Browse/page=1!68!50!966749,966752,1135104,1002373%2051&from=Galaxy-Redirect>. Accessed June 12, 2025.

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THIS PROGRAM IS  
AVAILABLE IN KEEPOSTED  
FOR HOME STUDY!

SEE PAGES 26-27 FOR  
CE INSTRUCTIONS AND  
TEST QUESTIONS!

# PROFESSIONAL AFFAIRS

## BEST PRACTICE CE INSTRUCTIONS

### USE OF PATIENT SPECIFIC PACKAGE LABELING TO IMPROVE PATIENT SAFETY WITH INSULIN PEN ADMINISTRATION

**Home Study:** Journal Article

**Target Audience:** Health-System Pharmacists and Pharmacy Technicians

**Learning Objectives:**

At the completion of this activity, pharmacist participants will be able to:

1. Describe the role of patient specific package (PSP) labeling in improving safety and preventing cross contamination in an inpatient hospital setting.
2. Review barcode compliance data and alert metrics to assess effectiveness of PSP labeling in improving patient safety.

At the completion of this activity, pharmacy technician participants will be able to:

1. Describe the importance of patient specific package (PSP) labeling in enhancing medication safety.
2. Explain the key elements of PSP labeling and its potential applicability to other multi-dose medications.



The Illinois Council of Health System Pharmacists is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education. This activity provides 0.5 contact hour (0.05 CEU) of continuing pharmacy education credit.

**Activity Type:** Knowledge-based

**ACPE Universal Activity Numbers:** 0121-0000-25-066-H05-P and 0121-0000-25-066-H05-T

**Release Date:** November 1, 2025

**Expiration Date:** November 1, 2028

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# EDUCATIONAL AFFAIRS

## HOME STUDY TEST QUESTIONS

### PHARMACISTS

1. Which of the following best describes how patient specific package (PSP) labeling reduces the risk of cross contamination with insulin pens in the inpatient setting?
  - A. It allows one insulin pen to be shared across multiple patients for efficiency.
  - B. It ensures each insulin pen has a unique patient and product-specific barcode, preventing use on multiple patients.
  - C. It requires manual nursing documentation in the MAR instead of barcode scans.
  - D. It removes manufacturer barcodes entirely so nurses cannot identify the product.
2. Following PSP implementation, barcode compliance initially decreased but provided new patient safety metrics. Which outcome most clearly demonstrates the effectiveness of PSP labeling?
  - A. Barcode compliance remained steady at 96-97%.
  - B. Nurses no longer needed to scan the patient's wristband before insulin administration.
  - C. 452 patients were prevented from receiving another patient's insulin pen due to system alerts.
  - D. The MAR documentation process was eliminated, reducing nursing workload.

### PHARMACY TECHNICIANS

1. Why is PSP labeling important for high-risk medications like insulin?
  - A. It simplifies the nurse's workflow by reducing the number of barcode scans required,
  - B. It ensures one pen is used per patient, preventing cross contamination, and increasing safety.
  - C. It replaces the need for pharmacy technicians to handle insulin pens.
  - D. It allows insulin pens to be relabeled on the floor by nursing staff instead of in the pharmacy.
2. What feature of PSP labeling makes it suitable for expansion beyond insulin to other multi-dose medications?
  - A. Adopting generic PSP barcodes eliminated the need to reconfigure labels, streamlining the process for labeling additional multi-dose products.
  - B. It eliminates the need for automated dispensing cabinets.
  - C. It allows nurses to bypass scanning the manufacturer barcode during administration.
  - D. The PSP process prevents patients from bringing their own medications to the hospital.

## ILLINOIS COUNCIL OF HEALTH-SYSTEM PHARMACISTS **POSTER** AND **PLATFORM** PRESENTATIONS FOR SPRING MEETING

### ICHP POSTER CATEGORIES

- Original Research
- Research in progress
- Encore
- Student

### AWARD-INELIGIBLE CATEGORY

- Case Report/Series

### PLATFORM PRESENTATIONS

- Abstracts submitted with results and conclusions will be eligible for a platform presentation (excluding case reports/series), as decided by the ICHP Educational Affairs Division Poster Review Committee.

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All Illinois health-system pharmacy practitioners, including pharmacists, pharmacy residents, pharmacy technicians, and pharmacy students are invited to submit projects for consideration. The submitting author must be a current ICHP member. If a student is listed as the submitting author for an original presentation, the poster will be eligible for the student award.

The submitting author should present the poster; however, if legitimate circumstances do not permit attendance at the meeting; another pharmacy professional author for that poster may present at the poster during the poster exhibit session at the Spring Meeting. All poster presenters must be registered for the Spring Meeting and complete ACPE required documents as requested if the posters are accredited for continuing pharmacy education.

### SUBMISSION OF POSTERS

Individuals wishing to present a poster should submit the information through the ICHP website: [https://ichpnet.org/pharmacy\\_practice/pharmacy\\_education\\_and\\_cpe/posters/poster\\_guidelines.php](https://ichpnet.org/pharmacy_practice/pharmacy_education_and_cpe/posters/poster_guidelines.php).

For complete list of guidelines regarding submissions, judging and presenting, please visit our website at the link above or by scanning the QR code below.

### SUBMISSION DEADLINE IS JANUARY 10, 2026

Questions? Contact Sharon Karina at [Sharonk@ichpnet.org](mailto:Sharonk@ichpnet.org). ■

THE 2025 ICHP SPRING MEETING WILL BE HELD MARCH 13-14, 2026, AT CROWNE PLAZA IN SPRINGFIELD, IL