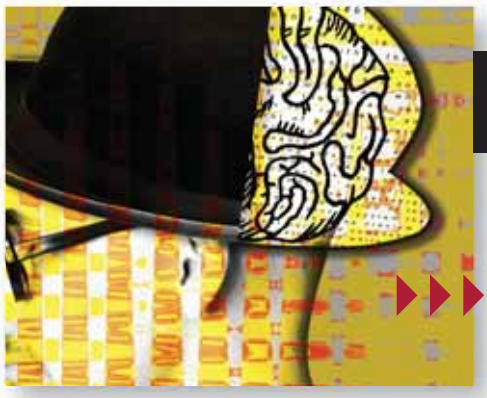


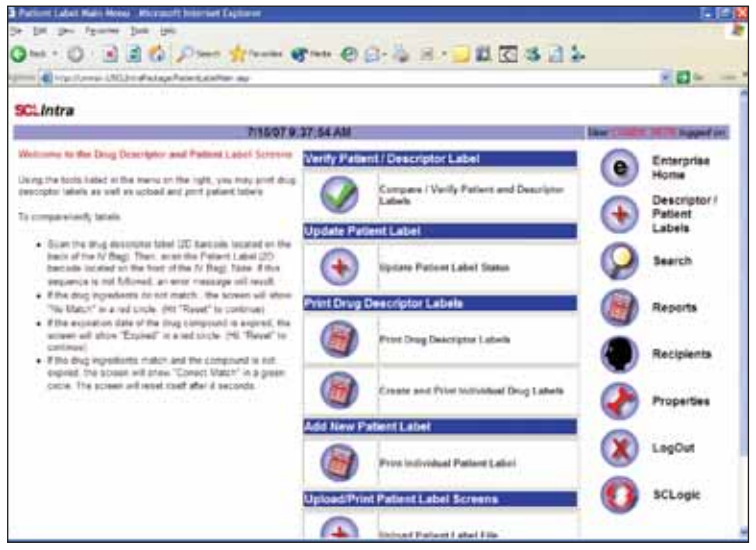
Why Didn't I Think of That...?

A Bar Code-Driven Software Solution to Reduce IV Medication Errors

Located in Baltimore, the University of Maryland Medical Center (UMMC) is a 750-bed, university teaching hospital serving a diverse patient population with a complete range of disease states and acuity levels. Decentralized pharmacies and a centralized IV lab prepare and deliver IV solutions to the patient care areas. In 2001, UMMC contracted a local firm, SC Logic, to develop a software platform that would improve the efficiency of processing premixed IV solutions (i.e., small-volume antibiotics, large-volume vasopressor solutions, and electrolyte solutions) and reduce our potential for error.

How It Works

Twice daily, our Cerner Millennium PharmNet pharmacy information system prints a report that lists the previous day's premixed drug use. Based on that report, the IV lab pharmacist generates a worksheet listing the quantity of each premixed solution to be processed that day. Technicians then access stored label formats in the SC Logic IV Track software and generate the required drug labels on a local Zebra printer. Each label's bar code includes an embedded drug name, diluent, volume, concentration, and expiration date. Technicians label the premixed products, sign the drug labels, and organize them for a pharmacist check. After the products are checked and signed by the pharmacist, the products are stored in designated bins. Stock rotation is performed for first-in-first-out inventory control. Because we perform these tasks during non-peak times, appropriate labeling of products is not tied to patient-specific medication production, which improves efficiency.



UMMC uses the SC Logic IV Track software to improve the efficiency of processing premixed IV solutions.

Six times daily (at 0200, 0600, 1000, 1400, 1800, and 2200), PharmNet generates a production batch for premixed products ordered for inpatients. The data is stored in a shared drive in a format readable by the IV Track software. IV lab staff members access IV Track and print the patient-specific labels on a Zebra printer stocked with a larger label stock appropriate for the expanded data quantity. The drug name, diluent, volume, and concentration are embedded in the patient-specific bar code. Technicians place these labels on the previously checked products and sign each label. The technicians use the IV Track software and a bar code scanner to compare the two bar codes on the product labels: the first drug-specific label and the second patient-specific label. If the bar coded drug information on both labels matches and the drug is not expired, IV Track alerts the technician both audibly and visually. Different audiovisual alerts occur when the information does not match. Items that fail the scan check are corrected by the technician and rechecked with IV Track, or the technician sets the items aside for pharmacist review. Items with matching information do not legally require an additional pharmacist check, which saves pharmacist time and reduces the human error component of the drug-labeling process. We have two hours to complete this final batching process, allowing us to deliver batches at 0000, 0400, 0800, 1200, 1600, and 2000. The medications in each batch are not scheduled for administration until one hour after the delivery time; for example, the 1200 delivery provides medications for the administration time range of 1300 to 1659.

Plans for Expanded Use

We have contracted with SC Logic to build additional features into a new version of the software, written in SQL. The new software will eliminate the need for the PharmNet batch file to be transferred to a shared drive and will remove the barrier now encountered when the batch is not available for printing due to FTP (file transfer protocol) failure. Also, SC Logic will alter the label design to enhance readability and retain the batch data, so batches or labels can be reprinted.

SC Logic has also identified modules that can be added to the IV Track software. IV Track is accessed through our intranet, permitting hospital-wide access; thus, IV Track can be expanded to generate labels in the pharmacy satellites. This new module will allow us to enter patient information into a form simulating the PharmNet label format, including user name, patient name, patient date of birth, medical record number, financial identifier, patient location, and drug information, such as name, dose, frequency, number of doses dispensed, and expiration date. The new module will also include an area for free-text comments. This would be valuable for use during PharmNet downtimes, as it would allow us to produce labels that are visually similar to those generated by PharmNet; nurses appreciate it when we adhere to label standards. These labels can be saved in IV Track for later order/charge reconciliation. Another new module will allow us to recycle the data generated during these downtimes to PharmNet from IV Track; the data will display in PharmNet as a CPOE order that requires verification, similar to a CPOE order from a prescriber. This will save time spent on charge/order reconciliation once the system is up and running again. ■

Authors:

Seth Cohen, PharmD
Pharmacy Manager, Central Production Services

Marc Summerfield, MS
Director of Pharmacy

University of Maryland Medical System