



## CASE STUDY : Bedside Barcoding

- Meta Healthcare IT Solutions
- Southern Ohio Medical Center

### Barcoding Solutions and Integrated eMAR Systems Help Prevent Medication Errors at the Point of Care

Meta Healthcare IT Solutions, based in Floral Park, New York, a leader in developing patient safety software for healthcare enterprises since 1991, has used First DataBank drug content in its hospital-based pharmacy system for nearly 20 years. When the company decided to expand beyond the hospital pharmacy into developing a nurse-friendly electronic medication administration record (eMAR) system, they first looked at the options that First DataBank offered to support such a system.

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When Meta realized that the breadth of drug content in the National Drug Data File (NDDF) Plus™ database supported applications beyond pharmacy, it was an easy choice. According to Sal Barcia, President of Meta, “First DataBank’s drug content is like working with a complete artist’s palette. The database contains far more drug information than we could possibly use initially. **The data is also flexible which supports us as system designers to create optimal clinical solutions during product development.**”

#### Meta Healthcare IT Solutions’ eMAR System

The MetaCare Enterprise eMAR™ system electronically integrates drug administration by the nursing staff with the hospital pharmacy’s information system. The Southern Ohio Medical Center (SOMC), a 222-bed hospital in Portsmouth, Ohio, has installed the eMAR system and the MetaCare Enterprise Rx, Meta’s pharmacy information system. At SOMC, before the nurse arrives at the patient’s bedside, the pharmacy staff has recorded medication orders in the pharmacy information system. That system automatically performs multiple safety checks by accessing the NDDF Plus database, while interacting with the patient’s electronic medical records. The pharmacy system then identifies potential drug-drug interactions, drug allergies, dose-range and drug-food warnings, alerting the pharmacist before dispensing the medication.

At the beginning of each shift, the nurse selects his or her patient list in the eMAR. When the nurse arrives at the bedside with the eMAR system, he or she scans the patient’s wristband to verify the patient’s identity against the eMAR record. At SOMC, the eMAR system, which is loaded on a tablet computer mounted on a laptop on wheels, communicates using barcodes transmitted via untethered barcode readers.

If the patient ID scan does not match, the nurse administers no medications until the patient is properly identified and is wearing the correctly barcoded wristband. When patient identity is correctly verified, the nurse scans each of the patient’s medications, which are barcoded with identifying information and dosage. The system has many features to verify correct dosage, including a calculator that allows for multiple tablets (or other dosage forms) to be added to arrive at the ordered dose. The nurse verifies that all medications are present compared to the list on the eMAR screen.

At the point of care, the NDDF Plus drug database in the eMAR system provides four different types of data to support medication administration and additional patient safety checks: patient counseling warnings, an image of the actual medication to be administered for visual verification, dose range warnings, and full AHFS® Drug Information monographs, which provide the nurse with complete drug reference information should questions arise.

#### Flexible Data Supports User Workflow

First DataBank’s solutions have proven critical for bedside barcoding developers like Meta Healthcare IT Solutions. **“One great example we have incorporated into our system is the ability to control the level of alerts.** When a new automated medical record solution is installed, clinicians are often plagued with so many alerts that they experience what is commonly known as ‘alert fatigue’ and routinely turn off clinical screenings or become conditioned to override all alerts without reviewing them,” says Barcia.



“During the first 12 hour shift, the NDDF Plus™ database integrated in the eMAR bedside barcoding system helped to **identify and prevent** 10 medication errors for 32 patients in the orthopedic unit.”

**TIM LACEY** Nursing Shift Supervisor

The flexible options available in the database enable Barcia’s team of software developers to program and integrate the data to circumvent multiple alerts. Hospital staff can set the severity of alerts to present only the specific level of alerts desired by clinicians. Likewise, the hospital staff may also choose to turn off alerts for specific interactive pairs of medications routinely prescribed in acute care situations.

On August 21, 2007, SOMC went live on their new bedside barcoding eMAR system from Meta Healthcare IT Solutions. SOMC rolled out the system one unit at a time, starting in orthopedics. According to Tim Lacey, Nursing Shift Supervisor, “During the first 12 hour shift, the NDDF Plus drug database, integrated in the eMAR system, helped identify and prevent 10 medication errors for 32 patients in the orthopedic unit alone.” Lacey notes that none of these medication errors were care-altering for the patients, but were errors nonetheless.

## BOTTOM LINE

- Bedside barcoding reduces and prevents medication errors vs. paper-based systems.
- The NDDF Plus database easily integrates into an eMAR system and has the right content such as dose checking and drug-drug interactions to help prevent medication errors.
- User-defined alert settings minimize “alert fatigue” and support ease-of-adoption of eMAR systems by users.

### Streamlined Medication Error Reporting Boosts Compliance

To report a medication error in the prior paper-based system, the nurse was required to self-report using a lengthy and time-consuming document, which, according to Rory Phillips, Director of Pharmacy Services at SOMC, rarely occurred.

“Compared to our prior paper-based system, the eMAR enables fast and easy error reporting with just the click of a button. Now, the nurse just clicks an icon next to the medication on the eMAR screen and the pharmacy receives an immediate documented alert. **Since we’ve started using the eMAR system, our medication errors have dropped from an average of 26 to 15 patient level errors out of an average of 116,000 doses administered each month.**”

Phillips continues, “Due to the ease of reporting with the eMAR system, our number of near misses have increased, which also helps us better examine our processes. However medical errors affecting patient care have decreased. We’ve also achieved 98.6% compliance with barcode scanning since implementation, the only exceptions being our emergency department, surgery, cancer center and outpatient services. This is a significant improvement to patient safety at SOMC.”

According to Barcia, “This capability supports our customers such as the Southern Ohio Medical Center in achieving rapid and complete adoption. SOMC transitioned seamlessly from a paper-based system to the eMAR system.”

### Bedside Barcoding with Comprehensive, Up-to-Date Drug Information Helps Prevent Medication Errors

The Southern Ohio Medical Center provides emergency and surgical care as well as inpatient and outpatient services. The 2,200 employees and more than 140 physicians and specialists have helped SOMC achieve top honors from the Joint Commission. SOMC has also received multiple awards—based on feedback from their employees—including the Number One Best Employer in Ohio by the Ohio Chamber of Commerce and being named to the prestigious *Fortune* 100 Best Places to Work in America list. In 2008, SOMC also won the national Magnet award for nursing excellence.

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