

Case Study --

**Implementing a Bar Coded Bedside Medication Administration System**

St. Luke's Hospital, in Chesterfield, Missouri, is innovative, having been named by Solucient\* as a 'Top 100 Hospital' for six of the past 10 years and one of 77 Benchmark Hospitals in the nation. Technology and process innovation have played an important role in achieving this recognition. With more than 1,100 physicians, 493 licensed beds and 3,000 employees, St. Luke's Hospital provides the perfect environment for establishing benchmarks and incorporating technology in patient care scenarios.

With a focus on patient safety and reducing medical errors, administration identified a need for an electronic medication administration and reporting system (eMAR). A dedicated team was formed including representation from stakeholder departments: Information Services, Nursing and Pharmacy. Team findings and recommendations were reported directly to the Hospital steering committee. Project team members were dedicated to the success of this project, giving it high priority. Eighteen months later, all aspects of the original project were completed. Following is their success story.

*\*Solucient is a provider of healthcare information products.*



*"Getting nursing input was essential in device selection; however, it was the Information Services Manager who suggested placing a laptop in each patient room, which was ultimately the best solution for care at bedside. The dedication of the project team and the support of administration helped ensure project success," said Cindy Scalise RN, Nursing Manager.*

*Choosing the Right eMAR Solution*

While the overall objective was clear, the project team worked through hundreds of decisions to mold St. Luke's eMAR solution. By soliciting feedback and including pharmacy and clinical personnel in solution definition, all participants were supportive during implementation. Governing decisions established priority for hardware ease-of-use, bedside point-of-care information access and only considered recommendations acceptable to all parties. The following decisions were significant:

- Laptops in patient rooms instead of computers on carts.
- Wireless bar code readers.
- Software with seamless integration to existing solutions.
- Implementation of eMAR in inpatient areas only.

Based on these decisions, vendor selection ensued. Information Services was tasked with recommending appropriate vendors. Products were obtained for evaluation, allowing team members and staff to handle products and conduct side-by-side comparisons.



*"I called Code often, sometimes waiting on the phone while they tested my programming suggestions to optimize the reader. Code was there each step of the way," said Glen Schodroski, Information Services Site Manager.*

St. Luke's Hospital committed significant financial and staffing resources to ensure the safety of their patients. Ultimately, several key products/vendors were selected for specific reasons, including:

- **Cerner's Bridge Medication Administration System**
  - Implementation methodology resulting in tailored solution
  - Proven successful implementations validated by site visits
  - Support of two-dimensional bar codes
  - Integration with existing clinical applications
- **Code Reader 2.0 Sold and Supported by Code Distributors – 150 Readers**
  - Wireless reader using Bluetooth technology
  - Ergonomic design, lightweight and user-friendly
  - 'Smart' reader that adjusted to its reading environment
  - Ability to read large variety of bar code types
  - In-field replaceable batteries
- **Laptop Computers - 250 PCs, with accessories:**
  - USB Nightlight
  - Lock
  - Keyboard cover
  - Mouse
- **Pharmacy Re-packager**
- **Hospital-wide 802.11b Wireless Communication System** (enabling use of Bluetooth technology)

Vendors were selected in part because of their willingness to modify their products to fit specific needs. Continual and immediate attention validated vendor selection decisions made by the project team.



*eMAR Implementation Process*

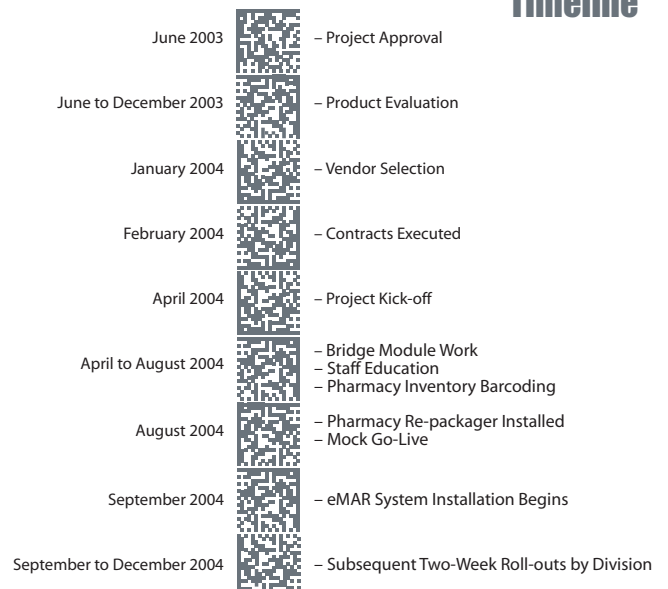
St. Luke's eMAR process follows these steps:

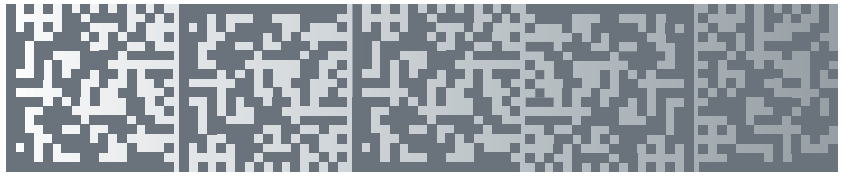
- Caregiver establishes Bluetooth connection between bar code reader and laptop.
- Caregiver logs in by scanning identification badge and entering PIN.
- Caregiver identifies patient by scanning the patient identification wristband.
- Caregiver scans dosed medication with either manufacture or hospital generated barcode.

Note: Each scanning activity initiates wireless information transfer. The bar code reader captures a bar code image, decodes the information and sends data to the laptop computer through the use of Bluetooth wireless technology.

- Software is now ready for use at bedside with patient-specific information viewable to caregiver during medication administration.
- Caregiver watches on-screen for warnings of 'Five Rights' violations:
  - Right Patient
  - Right Medication
  - Right Dose
  - Right Time
  - Right Method of Administration
- Caregiver reviews warnings, and determines next step. Caregiver exercises clinical decision-making responsibilities and documents decisions/actions.
- All data captured/actions taken are stored in the patient's medication administration record in real-time.

**Timeline**





Early discussions among eMAR team members addressed whether technology tools would remove decision-making authority from clinicians. Team members observed eMAR systems provided valuable decision-making tools, but did not remove decision-making authority. Ultimately, the decision regarding medication administration was still the caregiver's responsibility.

**Using the eMAR System - Discovery**

*Medication Bar Coding*

The biggest discovery made during project preparation was the lack of bar codes on medication. More than 80 percent of medication inventory had no bar codes. A re-packer was purchased. The team worked tirelessly to establish a new bar code system. A new system was established for placing new bar code labels on all dispensed/dosed medications. The Code Reader 2.0 was successful in reading a variety of codes, including new bar codes.

As pioneers in bar coding medications, St. Luke's staff has provided valuable information to pharmaceutical manufacturers. Vast improvements have been made; however, there is a long way to go before medications are received from manufacturers 'ready' for eMAR processes.

*User Training*

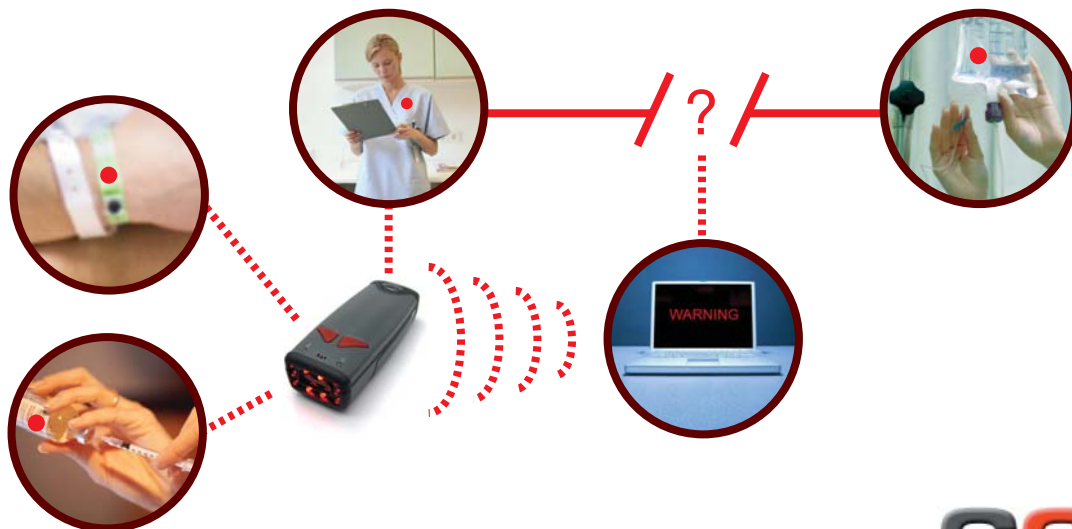
Early in discussions with nursing staff, it became obvious not all nurses were computer literate. Information Services was called upon to assess



basic computer skills. The hospital's Department of Education provided needed training to improve overall computer literacy before initiating system implementation.

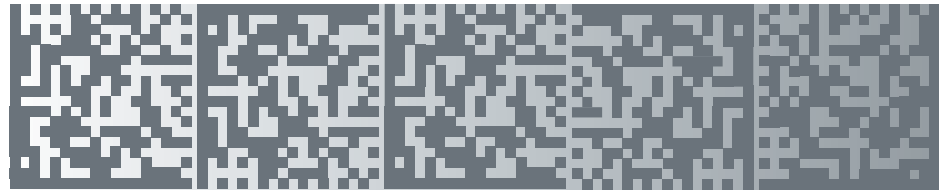
Additionally, attendance in a four-hour training class was required for all staff members who would use the Cerner's Bridge Medication Administration System. Some staff found it to be challenging. A training room was established allowing users of the system to complete the session as often as needed until they felt proficient. This approach helped ensure success once the system was in use.

Training issues in using the bar code readers surfaced quickly. Ongoing training occurred during go-live and continued as needed. Nurses learned how to get



**code**





a 'good read' through reviewing internally developed training materials. *Super users* were identified- those who had a knack for using bar code readers with accuracy. A super users group was formed. During go-live, super users were easily identified by their purple T-shirts and were called upon to provide one-on-one training as needed. Tips were provided in newsletters and through postings of 'red alert' notices on bulletin boards. A 'Look for the Dot' campaign encouraged nurses to locate the correct code.

#### *Asset Management*

Since bar code readers were wireless and 'in pockets' - sometimes they went home accidentally. Bar code readers were tagged as an asset. Asset management principles were put into play in order to create accountability for the investment in the hardware. Responsibility was given to shift managers to know the location of the readers assigned to their floors at all times. Shift change protocols required a check-in/ check-out activity with bar code readers.

#### *Metrics and Reporting*

Bar code reading compliance metrics have been useful in validating the use of the eMAR system, resulting in efficient management of nursing activities at bedside. Shift managers can review reports with parameters they select.

The detailed reports generated by the Cerner Bridge system identify possible medication administration errors and document prevented errors. Administration is pleased with the system metrics and proof their eMAR system is improving efficiencies. St. Luke's actively provides feedback to Cerner Bridge streamlining management reports.

#### *eMAR System Benefits*

Profound benefits from implementing an eMAR system have been experienced at St. Luke's Hospital in the following areas:

- Reduction of medication administration errors
- Increased patient safety and accurate reporting
- Improved communication between departments
- Improved process integration and information sharing
- Reduction in overall cost of care
- Valuable management-level decision-making tools
- Patient medication record information availability
- Increased efficiency at bedside
- More caregiver-patient interaction at bedside
- Bedside access to:
  - Procedures and protocols
  - Medication reference journals
  - Laboratory records

#### *In Conclusion*

St. Luke's Hospital attributes its eMAR implementation success to top-level management support and dedicated project champions. Even with significant dedication of staff, time and money, their administration is convinced it was well worth it. In fact, eMAR is just the first step. Improved patient safety is a driving force. With a continued focus on incorporating state-of-the-art technology tools, St. Luke's Hospital will continue to be an outstanding provider of superior patient care.

---

Contact:  
Alison Sheridan  
Sr. Project Manager - Marketing  
St. Luke's Hospital  
Phone: 314-576-2379 - office  
alison.sheridan@stlukes-stl.com  
www.stlukes-stl.com

Contact:  
Cindy Yates  
Director, Marketing Communications  
Code Corporation  
801 495 2200 x. 210 - office  
801 699 3346 - cell  
cyates@codecorp.com  
www.codecorp.com

*"We believe that as professionals at St. Luke's, we deliver safe care. Now with an eMAR system in place, it makes us even better," said Gail Wagner, Vice President of Nursing.*

