Closed-Loop Medication Management: The Big Payback

Ronald Small, MBA, FASHP, FAPHA
Vice President of Quality Outcomes
Wake Forest University Baptist Medical Center
Winston-Salem, NC

Jerry Kubej, MSHA
Senior Consultant, Value Management
GE Health Integrated IT Solutions
Seattle, WA
Welcome. Today we are going to discuss the benefits obtained at Wake Forrest University Baptist Medical Center (WFUBMC) through the implementation of a closed loop medication management process.

We will also use this example to review the approach and methodology used by WFUBMC to advance their strategic objectives throughout the organization. Utilizing a combination of process, cultural change management which relates addressing the staff (people) expectations and training as well as technology changes WFUBMC insured that their strategic imperative of providing superb, safe and effective patient care was not only supported but advanced through the implementation of the closed loop medication management process.

In addition we will review the Key Performance Indicators, or management metrics, utilized to demonstrate improvements in this process through measurements completed pre and post implementation.

Ron Small is Chief Pharmacy Officer and Vice President, Division of Healthcare Research and Quality Outcomes at WFUBMC. Ron earned his Pharmacy degree and MBA from the University of North Carolina. Ron has been certified as a Quality Improvement Trainer by the Juran Institute.

Ron is an Adjunct Professor of Pharmacy Practice with the University of North Carolina and Campbell Schools of Pharmacy and is a Lecturer in Hospital Administration at Wake Forest University.

Ron speaks frequently on topics related to quality improvement and pharmacy
LEARNING OBJECTIVES

In this session we will:

1) Outline an example of best practice for the medication management process.

2) Describe process improvement assumptions and required supporting technology requirements.

3) Describe how to identify and select Key Performance Indicators (KPIs) that align with organizational strategic initiatives.

4) Describe the methodology used to measure improvements in medication management process.

In this session, we will provide an example of a best practice for the medication management process. The workflow will be discussed at the “policy” and activity level and reflects the processes in place at WFUBMC.

We will describe the process changes that were implemented and the technology used to support the medication management process.

Before presenting that process we will describe an approach to identify and select key performance indicators that align with organizational strategic initiatives and can demonstrate, after measurement, that those initiatives have been advanced.

Finally, we will discuss the methodology used to measure, pre and post implementation, the selected KPIs. Gains made in the KPI values demonstrate process improvements and thereby, the advancement of your strategies and initiatives.
Wake Forest University Baptist Medical Center is an integrated health care system operating 1298 acute care, rehabilitation and long-term care beds, outpatient services and community health and information centers. It has 20 affiliate hospitals and 87 satellite clinics. It provides a continuum of care that includes primary care centers, outpatient rehabilitation, dialysis centers, home health care, and long-term nursing centers. WFUBMC carries out a mission of patient care, education, research and community service. The partnership includes three major members: Wake Forest University Health Services, North Carolina Baptist Hospital and Wake Forest University Physicians.
**PROBLEM SOLVING: WHAT WE DID**

**The Challenge:**
Improve the efficiency and effectiveness of the medication management process.

**The Approach:**
- Standardize the process
- Reduce process variation
- Eliminate unnecessary steps
- Reduce opportunity for error
- Measure results

**The Tools:**
- Process redesign
- Cultural change mgmt.
- Technology

WFUBMC has continuously focused on the use of clinical information systems to assist in streamlining workflows, reducing costs and improving quality of care and patient safety. Prior to the 1999 IOM report on patient safety and medication errors, WFUBMC initiated a project to assess their medication management process in order to improve its efficiency and effectiveness. The medication management process was defined as all activities associated with medication selection, ordering, dispensing, administration and monitoring.

The approach taken to improve this process was to standardize the process, reduce variation, identify and eliminate all unnecessary steps, and to reduce the opportunity for error by placing emphasis on workflows among physicians, nurses and pharmacists.

With top-down management involvement, close collaboration among pharmacists, nurses and physicians and extensive training and education, WFUBMC successfully underwent a significant organization-wide cultural change tied to the application of technology to support the medication management process. The closed-loop process insures that all caregivers have access to the same patient clinical information at the point of care. The technology changes included CPOE, the use of automated dispensing cabinets and robotic cart-fill and barcode assisted medication charting.
Literature indicates that there are 4 ways to maximize the value from an IT investment. The typical IT approach to implementing a new system involves automating existing processes. Using this approach, organizations achieve only 10% of the potential value from the new system.

We are not saying that IT is unimportant. What we are saying is that IT should be leveraged in order to solve your business problems. Additionally, by including process improvement activities and developing and executing a cultural change management plan an organization can maximize the level of value or benefits realized. It is the combination of people, process and technology changes that are vital to insure that targeted benefits are achieved.

Literature has shown and our personal experience has demonstrated that maximizing the value of a new system comes from introducing best practice and changing practice patterns. In this area, training and communication are critical. The challenge is to get people to adopt the best practice and making it part of their everyday life.

Literature and our project experience tell us that when projects fail, it is typically due to lack of focus on people and process.


**THE IMPORTANCE OF PROCESS**

**DEVELOPING STANDARD WORK**

Establish standard work that defines the normal conditions.

Develop a workflow diagram to visually represent all activities and steps in a process.

Time all of the activities and steps in the process.

Steps to establish standard work processes:

- ✓ Observe and understand the work.
- ✓ Measure and time the activities in the work process.
- ✓ Analyze the work.
- ✓ Validate the process.
- ✓ Identify and eliminate the waste.
- ✓ Standardize the new work cycle.
- ✓ Set targets and re-measure.

Process improvement is key to identifying, realizing and most importantly maximizing benefits.

To be effective, process improvement requires an evaluation and understanding of the current work processes being targeted for revision. This can only be effectively accomplished “from the floor” where you can really observe the workflow in action by “shadowing” staff as they work through the various activities in the workflow. In doing so, you can construct a workflow diagram as well as time the various activities in the process.

This approach will assist in defining the process variation, identify redundancy and waste as well as to define the opportunities to standardize the activities and steps in the process. Measuring is key, without measures there can be no improvement.
The approach we used can be summarized by the following diagram.

Starting at the right of the diagram the organization’s strategic initiatives or success factors are identified. These should reflect a Balanced Scorecard approach based on Kaplan’s original balanced scorecard model. This model suggests that organizations must focus on more than one area or objective to achieve strategic success.

For example, financial initiatives include revenue increases, cost reductions, operational efficiencies and productivity improvements. The Satisfaction quadrant would address goals related to patient, staff and physician satisfaction and perhaps any community outreach objectives. Quality initiatives reflect outcomes based measures such as increasing patient safety, reducing medication errors, increasing nursing spent on direct patient care. Innovation and Value goals address issues such as increasing the number of treatment protocols or critical pathways agreed to implemented, the use of bar coding to support the medication management process and the use of technology to improve the accessibility of records and images

Traditional ROI has cash implications and can mislead the organization into believing that returning $$$ to the bottom line is the strongest objective. The Balanced Scorecard approach does include cost savings, but focuses on other strategic objectives such as quality. and correspond to the balanced scorecard previously shown. The 4 quadrants of the balanced scorecard start with what your value is and the strategic success factors defined by your organization. For example, if you define Quality as being one of your strategic success factors;
SELECTING KEY PERFORMANCE INDICATORS

KPI Selection Criteria

- Aligned with strategic goals.
- Measurable.
- Repeatable.
- Short and long-range benefits.

KPIs Selected To Measure Increased Quality and Enhance Patient Safety

- Medication errors.
- Compliance with the 5 Rights.
- Process time savings.

Our goal was to measure and demonstrate the value obtained as a result of process changes in medication management. To this end, an analysis was conducted to identify and select appropriate KPIs that demonstrated improvements in quality and patient safety.

The selected KPIs were:

- Medication errors at administration
- Compliance with the 5 rights
- Time savings in the administration process

It must be noted that KPI's can impact more than one Strategic Success Factor.

For example, a reduction in medication errors measured as potential ADE’s, impacts all 4 components the balanced scorecard. While it is primarily a quality indicator, it also has a financial impact as demonstrates in the Bates studies at Brigham and Women’s as reported by the Clinical Advisory Board document, CPOE Lessons from Pioneering Institutions, the costs associated with each ADEs are $4,685 per occurrence which addresses the cost of additional services required. Improving quality also improves staff and patient satisfaction, as the outcome was observed and anecdotally reported at WFUBMC.

It should be noted that the medication management process is at risk for errors at all stages, the greatest percentage of preventable ADE’s occur during
SYSTEM IMPLEMENTATION TIMELINE

1998 – Initial implementation of EMR included Results Reporting, Initial Nursing Assessment, Pharmacy, Medication Charting.

2001 – Sunset prior Order Entry system and implemented non-CPOE Ancillary Order Entry as an integrated component of the EMR.

2002 – Implemented EMR upgrade, continued roll out of Nursing Documentation, Implemented first CPOE unit (28-bed Cardiology unit).

2003 – Implemented four more CPOE nursing units, continued roll out of Nursing documentation. Implemented EMR upgrade.

2004 – Implemented CPOE on ten more Nursing units.

2005 – Implemented EMR upgrade, continued roll-out of CPOE.

2006 – Continued with the CPOE roll-out. Implemented four nursing units as the BCMC pilot. Followed with roll-out to all nursing units.

This chart briefly describes the system implementation timeline and milestones of the EMR system throughout WFUBMC. The system is an EMR with fully integrated order management, including CPOE, pharmacy and clinical documentation, including barcode assisted medication charting.

The initial implementation in 1998 included Results Reporting, Initial Nursing Assessments. Pharmacy and medication charting.

In 2001, we implemented non-CPOE Ancillary Order Entry as an integrated component of the EMR.

The following year, 2002, we upgrade the system to the newest version and continued our roll-out of the nursing documentation. We also implemented our first unit on CPOE. The pilot unit was a 28 bed cardiology service. The benefits obtained and measured for the Cardiology Service will be presented in a later slide.

In 2003, we continued with the CPOE implementation activating an additional 4 nursing unit as well as continued with the roll-out of nursing documentation. We also implemented an EMR system upgrade.

We continued with the CPOE roll-out in 2004 and implemented CPOE on 10 more nursing units.
This chart is a graphic display of progress with implementing CPOE throughout WFUBMC.

Initial pilot units activated in 2002.

Currently have CPOE active on 616 beds. This represents approximately 70% of our acute care beds.

Only pediatrics with 139 beds and the ICUs with 136 beds are not CPOE enabled.
Our objectives were to improve quality of care and enhance patient safety, the published literature was reviewed to understand where potential errors typically occur in the medication management process.

This slides reflects the information resulting from the Bates studies and reported in JAMA.

From this research and the analysis of our process, projects were initiated to reduce errors at each of these failure points and we sought to change our processes and apply technology to make the process more efficient and to reduce the opportunity for error. Each activity was critically analyzed to identify improvement opportunities and establish mutually re-enforcing workflows between physicians, nurses and pharmacists.

This was one of the initial steps in a journey that took several years.
MEDICATION ERRORS: WHAT WE MEASURED

Adverse Drug Event (ADE)

FDA definition:
Any unfavorable and unintended sign, symptom, or disease temporally associated with the use of a medicinal product, whether or not considered related to the medicinal product.”

As the term Adverse Drug Event can mean many things to different individuals, this is the definition of adverse drug event that was utilized. This is the Food and Drug Administration definition of an adverse drug event.
MEDICATION ERRORS: WHAT WE MEASURED

**NCCMERP definition:**
“A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer.

Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use.”

As the term medication error can mean many things to different individuals, this is the definition of medication errors that was utilized. This is the National Coordinating Council for Medication Error Reporting and Prevention definition of a medication error. The NCC MERP urges that this definition be adopted as a standard definition for medication error.
TYPES OF MEDICATION ERRORS

- Drug Omission
- Improper Dose
- Wrong Strength/Conc.
- Wrong Dosage Form
- Wrong Technique
- Wrong Route
- Wrong Rate
- Wrong Duration
- Wrong Time
- Wrong Patient
- Monitoring Error
- Expired Drug

These are the common types of medication errors to reduce through improving the medication management process.

In this list of errors several have the potential to cause serious harm to a patient, others while in and of themselves are errors, may not cause harm.

For example, a medication given at the wrong time, that is outside of the times specified by the medication order’s frequency and schedule. These “wrong time” errors can be masked in a manual process however with a schedule range set by a barcode assisted administration system these types of errors are identified each time.

Typically a range is set in the system around the scheduled administration time, typically if a medication is administered within 30 minutes before or after the scheduled time it counts as on time. However, once that range is exceeded, the system will log that as an error. Again, this may not be a serious error, but it is logged and reported as an error nonetheless.

In implementing a barcode assisted medication charting many of the errors that were previously unseen will become visible. Staff should be prepared for this and training and action plans in place to address this increased error reporting. The plans to address this eventuality should be included in the cultural change management plan.
Prior to the incorporation of technology into the medication use process, the major activities within the medication management process were paper based for physician ordering. Orders were sent to pharmacy via tube, fax or hand-carried depending on priority. Orders were manually transcribed to various documents and verified by the nurse.

Once received in the pharmacy, orders were verified by the pharmacist and dispensed to the unit typically via cart fill.

Nurses charted on a paper MAR which was updated manually throughout the day as new orders were written. Compliance with the 5 rights was procedural but not enforced and did not include any double “checks” by any system.

Medication charges and credits were managed and generated based on usage report and medications returned to stock at cart exchange.

In total we identified the 25 key transactions in our medication management process that are listed on this slide and the individual who performed them. Many of these steps added time to our average medication order turn-around time, some were redundant and many steps provided an opportunity for an error to occur in the process.
MEDICATION MANAGEMENT WORKFLOW: CLOSED-LOOP PROCESS WHERE WE ARE TODAY

This workflow describes the major activities within the medication management process as it exists today.

The approach addressed reducing ordering and transcription errors through the implementation of CPOE. Dispensing errors were addressed through the use of medication cabinets and robotics for automated cart fill. Medication administration errors were addressed through the application of barcode assisted medication charting.

Underlying these improvement activities is the utilization of an organization-wide implementation of an electronic medical record system. The EMR supported the medication management process by insuring that all caregivers had access to the same patient clinical information. The EMR improved not only the accessibility of clinical information but it also addressed issues related to reducing the potential for transcription errors and eliminating many steps in the paper-based process previously described.

In the current process, physicians enter the order electronically. The system supports physician’s decision making on which particular drug to select as well as the use of protocol driven order sets. The order is automatically routed to the pharmacy for verification and the nurse is alerted that new meds have been ordered and require validation. Once the pharmacy verifies the order, it is automatically profiled to the patient and can be pulled from the medication dispensing cabinet or removed from the unit med cart. Medication administration is done via barcode which documents the event and generates the charge. There are 8 steps in our current process.
CPOE PROCESS COMPARISON: **ELIMINATE UNNECESSARY STEPS**

<table>
<thead>
<tr>
<th>WHERE WE STARTED</th>
<th>WHERE WE ARE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHYSICIAN</strong></td>
<td></td>
</tr>
<tr>
<td>Locate Chart</td>
<td>Activate Patient</td>
</tr>
<tr>
<td>Handwrite Order</td>
<td>Write Electronic Order</td>
</tr>
<tr>
<td>Flag/Return Chart</td>
<td></td>
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<tr>
<td>Notify Unit Clerk/Nurse</td>
<td></td>
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<tr>
<td><strong>WARD CLERK</strong></td>
<td></td>
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<tr>
<td>Review Chart</td>
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<tr>
<td>Transcribe to MAR</td>
<td></td>
</tr>
<tr>
<td>Send Copy to Pharmacy</td>
<td></td>
</tr>
<tr>
<td><strong>NURSE</strong></td>
<td></td>
</tr>
<tr>
<td>Review Chart</td>
<td></td>
</tr>
<tr>
<td>Validate Order</td>
<td>Electronic Validation</td>
</tr>
<tr>
<td>Transcribe to MAR</td>
<td></td>
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<tr>
<td>Transcribe to Database</td>
<td></td>
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<tr>
<td><strong>PHARMACIST</strong></td>
<td></td>
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<tr>
<td>Receive Order</td>
<td>Electronic Verification</td>
</tr>
<tr>
<td>Order Verification</td>
<td></td>
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<tr>
<td>Transcribe to Rx Database</td>
<td></td>
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<tr>
<td>Medication Dispensed</td>
<td></td>
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<tr>
<td><strong>NURSE</strong></td>
<td></td>
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<tr>
<td>Receive Medication</td>
<td>Receive Medication</td>
</tr>
<tr>
<td>Confirms 5 Rights</td>
<td>Confirms 5 Rights</td>
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<tr>
<td>Administers Medication</td>
<td>Administers Medication</td>
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<tr>
<td>Handwrite Documentation</td>
<td>Electronic Documentation With Billing</td>
</tr>
<tr>
<td><strong>PHARMACY</strong></td>
<td></td>
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<tr>
<td>Update Reports</td>
<td></td>
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<tr>
<td>Dose Reconciliation</td>
<td></td>
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<tr>
<td>Manual Billing</td>
<td></td>
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<tr>
<td><strong>TOTAL TRANSACTIONS</strong></td>
<td><strong>24</strong></td>
</tr>
<tr>
<td></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

This table is a side-by-side comparison of the before and after medication management process activities. It depicts the number of steps in the process that we were able to eliminate through careful analysis of redundant and non-value added steps and how we could utilize the automated tools available to support the process.

The effort we placed in analyzing the “where we started” workflow and developing the standard workflows allowed to create a more efficient process. Additionally, each activity in a process provides the opportunity to introduce errors. Eliminating activities can also improve the quality of a process.
ORDERING: ERROR REDUCTION

Key Considerations:

✓ Standardized pre-printed order forms.
✓ Approved protocols.
✓ Policies limiting verbal orders – requiring read-back.
✓ Computerized Prescriber Order Entry – CPOE.

One of the initial steps in addressing the process changes was related to reducing the opportunity for error in the ordering process. Activities to reduce errors were focused on policy, procedural and technology changes in not only the medication ordering process but in the medication selection process as well.

For example, Clinical Pharmacists round with 30 medical and Surgical Services to assist in the optimization of drug therapy. Evidenced-based practices are incorporated through extensive use of protocol driven orders. Pharmacists review all medication orders.

In the process changes, it was critical to ensure that the transfer of information regarding desired drug therapy occurred across the continuum of care and from the prescriber to the departments and personnel responsible for executing those orders.

A process was established to review and approve protocol orders and order sets, as well as to create and enforce a policy limiting verbal orders and in those instances where verbal orders are appropriate, read-back is required.

A key component of our error reduction strategy was computerized physician order entry. The use of an electronic order removed all issues related to legibility, misinterpreting a written order, minimizing lost and duplicate orders and time spent on call backs for clarification. Insuring buy-in was the next critical step.
The chart reflects the committee organization structure established to engage senior clinical and administrative leadership, physicians and the “rank and file” care givers in the decision making process. Getting their buy-in was critical to achieving success. The key issues and guiding principles used were:

Engage physicians and top administration. Identifying a Physician Champion is key.

Identify and assemble work groups, this must be across disciplines and teams should meet weekly.

Involve clinical care givers at all levels of the organization in the decision making process regarding workflow, equipment, system design and set-up, etc.

Develop order sets by service to minimize screen flips and expedite order entry. Order sets and protocol orders were approved via the committee structure indicated above.

Establish guidelines and follow through with supporting processes.

Provide adequate equipment to address both functional and availability requirements. Minimize or eliminate queuing or waiting for a device to become available.

Provide adequate training and support staff.
CLOSED-LOOP MEDICATION MANAGEMENT
Advantages and Benefits Observed:

- Eliminated all manual order transmission activities.
- Eliminated all order transcription activities.
- Integrated physician, nurse and pharmacist workflows.
- Provided consistent patient and clinical information to all caregivers.
- Eliminated shift and 24-hour chart checks.

The closed-loop process offered many advantages. All of these issues are benefits that were observed and achieved. These issues were not directly measured, for example, with the elimination of manually transmitting the medication order to pharmacy, several activities were deleted from the process, i.e., there is no time spent on faxing or tubing the order sheet to pharmacy. Call-backs for order clarification due to legibility to the physician or nurse no longer occur. We did not measure the number of calls eliminated nor the time spend on those calls. Additionally, issues related to duplicate and “lost” orders have been essentially eliminated.

It should be acknowledged that CPOE does introduce new types of errors. The “point and click” errors that will cause the wrong dose or even the wrong “John Smith” error.

The elimination of the transcribing errors is reflected in the reduction of our ADE rate.

In the current process, once the order is electronically written by the physician, it is available to all authorized caregivers for review and action. As the order entry, pharmacy and clinical documentation system including barcode assisted med charting are integrated there are no interfaces to maintain between these systems. Most importantly, all caregivers have access to the same patient clinical information.

Additionally, this system integration and the workflow integration has eliminated the activities associated with the shift and 24 hours chart checks. Although the time savings associated with these activities were not measured, it was anecdotally reported that nurses saved 1 – 2 hours per shift. This was especially prevalent for the night shift who typically completed the 24 hour chart check.
BENEFITS MEASURED: EMR AND CPOE*

Measured and documented benefits achieved through the implementation of our integrated EMR and CPOE system.

- Concurrent access to charts (no more “chart-chase”).
- Prevention of over 65,700 duplicate/conflicting tests per year.
- Avoiding $2,673,989 in direct expenses per year.
- Reduction of $322,445 per year in Medical Records costs.
- Reduction of $149,000 in Outcomes Management administrative costs per year.


This slide describes the measured and documented benefits obtained through the implementation of an integrated EMR and CPOE system.
**BENEFITS MEASURED: CPOE**

Measured a 67% reduction in preventable ADEs for the Cardiology Service through CPOE.

This slide describes the reduction in preventable ADEs as measured pre and post implementation in the Cardiology service. WFUBMC realized a 67% reduction on preventable ADEs in this service.
BENEFITS MEASURED: CPOE

Measured a 40% reduction in ADEs per 1,000 doses for the Cardiology Service through CPOE.

This slide describes the reduction in preventable ADEs per 1000 doses as measured pre and post implementation in our Cardiology service. WFUBMC realized a 40% reduction on preventable ADEs in this service.
ADMINISTRATION: ERROR REDUCTION

Key Considerations:

- Point of care verification and documentation system.
- Ensure compliance with the five rights of medication administration.
- Accurate and efficient documentation.
- Nursing double check at administration.
- Barcode Assisted Medication Charting.

In assessing the medication administration component of the medication management process the focus continued on supporting the error reduction strategy. To this end, key considerations were established as the process and technology drivers that would streamline the process, enhance patient safety and reduce errors.

The fundamental approach was to ensure that the medication verification and documentation of medication administration occur at the bedside. The documentation step needed to be efficient, timely and accurate, minimizing the need for nursing to handwrite anything on MARs, work lists or “cheat sheets” and then enter that same information into the system. With on-line med charting “batch” chart medication administration entries into the system as time permitted or at the end of shift was to be avoided. Given that all caregivers had access to the same clinical information, timely entry of med administration was key.

A system that would support and insure compliance with the 5 rights had to implemented. That is: Right patient, Right medication, Right dose, Right route and Right time. The requirement to provide nurses with the double check and double signature at administration needed to be addressed.

Based on these considerations it was apparent that the use of barcode assisted medication system that was an integrated component of the current medication management process would be a key component of the approach and provide the greatest opportunity to achieve our anticipated benefits.
BARCODE MEDICATION CHARTING PROGRESS

Activation Approach:

- Pilot and roll-out strategy.
- Pilot sites included Cardiology, CCU, Pediatrics Day Hospital and Renal. Scheduled pilot period was approximately three weeks.
- Pilot activation week of 3 October.
- House-wide roll-out occurred the week of 30 October.

We will need a similar slide to describe the BCMC rollout process.

A pilot and roll-out approach included:
- Cardiology
- CCU
- Pediatrics Day Hospital
- Renal Unit

The pilot lasted approximately three weeks and was used to identify strengths and weaknesses in the process, system set-up and the hardware. This also provided the opportunity and time to make any required adjustments to these areas. Other than a few minor issues, including the usual change management issues, the pilot went well.

Lessons learned and anecdotal reports from the units:

- Nurses reported satisfaction with improved error detection, “the system identified potential errors that I would have missed.”

- Patient satisfaction: Patients perceived an increase in the quality of care and felt that barcoding increased their confidence in the delivery of care.

House–wide roll-out occurred in late October and early November. We are currently supporting 100% of our acute care beds with barcode assisted medication charting.
BARCODE MEDICATION CHARTING: ADVERSE DRUG EVENTS (ADE)

ADEs per 1000 Doses

Pilot Unit

xx% reduction

Pre-BCMC
Post-BCMC

PLACEHOLDER SLIDE – DATA IN ANALYSIS

Text and data to be added upon completion of chart review and analysis.
A very high priority was to provide a system to support compliance with procedures to check the 5 rights every time a medication dose was administered to a patient.

This graph represents a comparison of the pre and post measures of compliance with the 5 rights.

The pre-implementation measures were obtained by shadowing nursing staff during their shift. Individuals doing the shadowing were nurses with clinical experience. While shadowing nurses throughout their shift we recorded each time a nurse compiled or failed to comply with checking the 5 rights. The process was repeated post implementation. Although post implementation the system forced the compliance check while scanning the medication and the patient wristband. The system recorded and reported any resulting errors.

The pre-implementation analysis demonstrated that nurses typically complied with the 5 rights check approximately 50% of the time. (Slide above focused on the wristband only, will adjust this as needed given the data.)

Post implementation, compliance with the 5 rights checking was nnn.nn%.
Measuring the impact of BCMC to process time was also an important consideration. Included in the process time measure was the time nurses spent to obtain and prepare the medication for administration to the patient and the time nursing staff spent in administering and documenting the medication to the patient.

This graph represents a comparison of the pre and post measures of process time spent in the medication administration process.

The pre-implementation measures were obtained by shadowing nursing staff during their shift. Individuals doing the shadowing were nurses with clinical experience. While shadowing nurses throughout their shift we timed with a stopwatch the activities included in the med preparation process and the administration and documentation. The process was repeated post implementation.

The pre-implementation analysis demonstrated that nurses typically spent approximately 11 minutes on this process. (Slide above combines the two components into one overall time report. Review potential to use the bar chart above to identify show the portion of time that was prep and the portion that was admin/doc.)

Post implementation, the time spent on this process was nnn.nn%.

The difference is a result of xxxxxxxxxxxxx. Explanation can be added following post implementation data collection and analysis.
BARCODE MEDICATION CHARTING

Requirements:
- Worklist charting capability that supports BCMC.
- Radio frequency capability.
- Barcoded wristbands for patients.
- Barcodes on nursing badges.
- A non-punitive error reporting system.
- Utilize error reports to foster Continuous

In adding BCMC to the medication management process additional cultural change, process and technology changes had to be addressed. These issues were vital to the success.

Nursing staff were accustomed to on-line medication charting. BCMC had to be integral to the system and the electronic workflow staff already used. This was one of the reasons to accelerate the roll-out.

To support charting at the bedside, radio frequency capability was utilized to provide connectivity at the bedside.

To support the workflow process barcodes had to be added to the patient’s wristband and to the nurse’s name badge. This supported compliance with the 5 rights and to make the documentation process more efficient.

One of the components of cultural change management plan was to assist staff in understanding that the number of errors being reported would increase dramatically as a result of the system. This is because errors that went previously undetected would now be caught and reported. The challenge was to assure staff that these new error reports would be utilized for continuous review in order to identify additional ways to improve process to eliminate errors. Adopting a non-punitive approach to managing errors is key.
OBJECTIVES AND BENEFITS

Benefits of our approach:

- Aligns KPIs with strategic success factors.
- Provides methodology to define and achieve value through people, process and technology improvements.
- Demonstrates performance improvements through pre and post-implementation KPI measurements.

The key to maximizing benefits is to utilize a combination of cultural change management, process improvement and technology to drive and sustain change in an organization. Should any one of these key components be missing, the benefits achieved will not be as full as they could have been. The process component and the cultural change component are more important than the technology itself.

It is important to ensure that all project participants understand how the organization’s agreed to strategic success can be advanced by the project and be able to demonstrate that linkage by aligning key performance indicators with organizational strategic initiatives.

Finally, select KPIs that are measurable and repeatable and measure the baseline pre-implementation and measure the results post implementation. Through the cultural change management plan, have identified an internal marketing and communication plan so the project participants, senior leadership and the organization can see and understand the results of the project.

Now we will open it up to questions.
SUMMARY AND QUESTIONS

“It’s not the progress I mind, it’s the change I don’t like.”

Mark Twain

“Success in integrating IT with key business initiatives will be one of the most important challenges healthcare organizations will face in the near future.”