



The Impact of a Multi-Professional Approach to Building a Culture of Safety Through the Utilization of Barcode Technology

Carilion Clinic

Override Initiative Team

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Institute of Medicine

- ◆ To ERR is Human: Building a Safer Health System
 - ◆ “Changed the conversation” to adopt new safe practices
 - ◆ Introduction of technology & process changes
 - ◆ 5 years later improvements made but scope of the problem remains
 - ◆ Med mistakes injure 1.5 million patients annually
 - ◆ Hospitalized patients are at risk for at least 1 med error daily

Kelly, W. and Rucker, D. (2006). Compelling features of a safe medication use system, *Am J Health-Syst Pharm*, 63, 1461-8.



ADE Outcomes

- ◆ Most common: increased length of hospital stay by one or two days on average.
- ◆ Permanent injuries
- ◆ Death
- ◆ Impact on Healthcare professionals
 - ◆ Work related stress
 - ◆ Loss of confidence
 - ◆ Career ending errors



Carilion Clinic

- ◆ 628 bed tertiary Care hospital
- ◆ BCMA (Bar code Medication Administration) first implemented in 2001
- ◆ Full Inpatient Implementation completed in 2003
- ◆ 2006-a near miss sentinel event brought issues with drug overrides to the forefront.
- ◆ Current compliance was at 82.2%



Fall 2006 Near-Miss Sentinel Event

- ◆ Paralytic infusion hung in lieu of a cardiac infusion in a ventilated intensive care patient.
- ◆ Fatality likely in non-ventilated patient
- ◆ Occurred because of a scan failure leading to override of the safety system



Fall 2006 Near-Miss Sentinel Event

- ◆ Woke up an institution to the realities of the IOM report
- ◆ Strong support from leadership to re-energize a “Culture of Safety”



Statement of Problem:

- ◆ Multifaceted problems with our medication barcode technology created an environment of forced “work around or override” of the system to ensure timely administration of medication on behalf of patients; resulting in a loss of safety checks for 15% (1,500 per day) of medication Administration.



Objective:

- ◆ Develop an integrated, multi-professional approach to identify and correct factors contributing to poor medication scanning compliance thereby reducing risk to patients.



Culture of Safety

*Foster a culture of
change and safety
at the bedside.*



Methodology:

- ◆ Multi-Professional Team
 - ◆ Nursing
 - ◆ Pharmacy
 - ◆ Human Resources
 - ◆ Materials Management
 - ◆ Technology Services
 - ◆ Quality Management
- ◆ Commitment “whatever it takes to do the right thing for the patient” was embraced
- ◆ Strategy: Foster a commitment to a culture of safety by making it “Personal”



Multi-Professional Team

- ◆ Ellen M. Harvey MN, RN, CCRN, CNS, Nursing Performance Improvement Specialist
- ◆ Cynde Early BSN, RN, Nursing Informatics Specialist
- ◆ Jennifer Martin BSN, RN, Senior Director Medical-Surgical Critical Care, Magnet Coordinator
- ◆ Karen W. Lowdon RPh, MSHA, ACHE, Senior Director CMC Pharmacy
- ◆ Larry N. Mullins RPh, MBA, Director Pharmacy Operations and IV Admixture
- ◆ Chad E. Alvarez, PharmD, MBA, Director Pharmacy Systems and Support Services
- ◆ Brian Williams CPhT, Pharmacy System Analyst
- ◆ Lori McLure RPh, Manager Pharmacy Services
- ◆ Cheryl Boone RPh, Manager CMC Admixture Center
- ◆ Melissa Marshall PharmD, BCPS, Operations Manager Pharmacy
- ◆ Victor DeLapp PharmD, BS, Medication Safety Clinical Specialist
- ◆ Clara Anne Davis RPh, Director, Pharmacy Contract Materials Management
- ◆ Lisa Pendleton BS, RN, Education Consultant Human Resources
- ◆ Chris Riha MS, CCE, Director, Technology Services Group
- ◆ Belinda Williams RN, Applications System Analyst Technology Services Group
- ◆ Catherine Marlow MHA, Patient Safety Officer
- ◆ Scott Malbon PhD, MBA, Director Quality Management



Plan Development:

- ◆ Evaluate history and reasons for overrides
- ◆ Identify Factors that contribute to overrides
 - ◆ Processes
 - ◆ Technology
 - ◆ Training
 - ◆ Non-bar code related (downtime, Nursing Message)



History of Errors Prevented

- ◆ Incorrect Patient scan
- ◆ Bad Drug Scan
- ◆ Average 8000 errors/year prevented
- ◆ These may have gone undetected without BCMA
- ◆ Error prevented as a % of total Administered Medications < 0.5%

Reference Diagram A

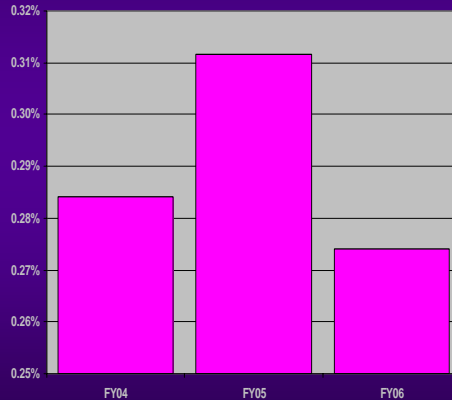


Diagram A



Review History of Drug Overrides

- ◆ FY03 Average 86.7% Compliance
- ◆ FY04 Average 86.3% Compliance
- ◆ FY05 Average 85.4% Compliance
- ◆ FY06 Average 82.3% Compliance
- ◆ FY06-Significant decrease in compliance
 - ◆ Dec. 05 to 81.7%, down to 80.7% in April 06

Reference Diagram B



% Drug Override Compliance

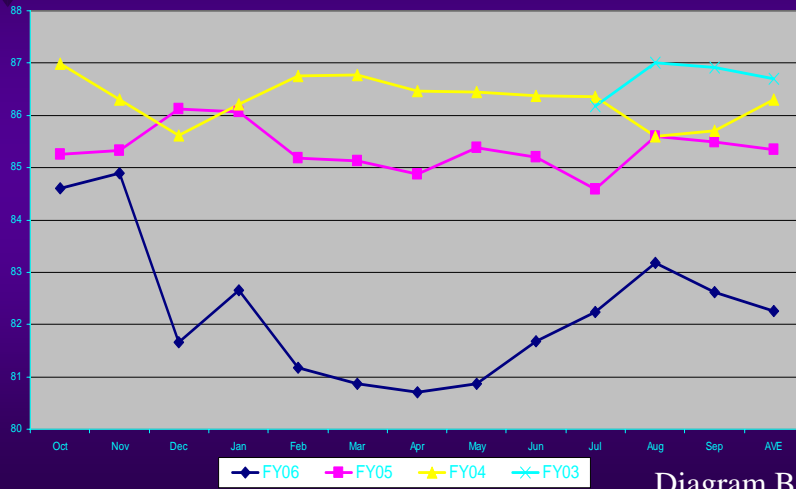


Diagram B

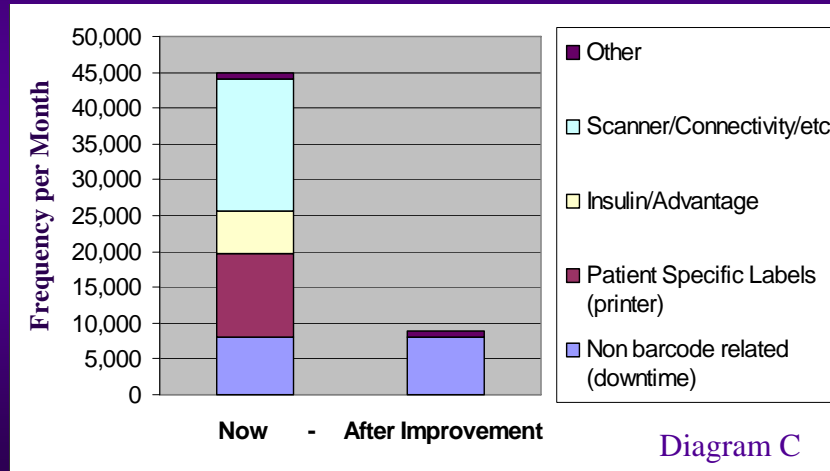


Detailed Evaluation of Overrides

- ◆ Total overrides evaluated 26,675
 - ◆ 3 weeks reviewed, 1 week/month for 3 months
 - ◆ Areas noted:
 - ◆ Non Bar code related 18%
 - ◆ Downtime
 - ◆ Patients own med
 - ◆ At the bedside/Multi-dose container
 - ◆ Nursing messages 2%
 - ◆ Insulin/Advantage issues 13%
 - ◆ Equipment/People (Bar code reads) 41%
 - ◆ Patient Specific labels 26%
- Reference Diagram C



Drug Override Reasons 2006



Clearly Define Appropriate Use of Override

- ◆ Charting after administration
 - ◆ Downtime
 - ◆ Patient off unit
 - ◆ Emergent event
- ◆ Charting during administration
 - ◆ Bar code will not read – notify Pharmacy
 - ◆ No barcode available – notify Pharmacy



Determine: How Safe do we have to be?

- ◆ If we make only 1 error in 1,000 doses administered:
 - ◆ Accurate 99.9%
 - ◆ That's 4,500 errors annually at CMC or 12 per day.
 - ◆ Each nurse will make 7 errors per year.
- ◆ On the order of only 1 error per 100,000 to 1,000,000 doses
 - ◆ 99.999% accurate
- ◆ This will require consistent use of well-designed, reliable technology in conjunction with good judgment, attention to detail and adherence to processes



Solutions:

- ◆ Mandatory Education
- ◆ Implement Thermal printer
- ◆ Implement Insulin Pens
- ◆ Upgrade Wireless network
- ◆ New Barcode scanners
- ◆ Second license staff verification required for all non-emergency med overrides
- ◆ Encourage each other and celebrate success



Staff Education: Safe Medication Use Deliverables

- ◆ **Mandatory Education**
 - ◆ Commit to a culture of safety
 - ◆ Make it personal – this is our community
 - ◆ Face the complexities with resolve to improve
 - ◆ Transform from risky workarounds for “the sake of the patient” to best practice

- ◆ **Have faith in and use processes that make a difference**
 - ◆ Adhere to the five rights relentlessly
 - ◆ Read the drug label- check 3 times
 - ◆ when you obtain the drug, when you prepare it and before you administer it
 - ◆ Commit to Medication Documentation at the point of care

- ◆ **ALL OVERRIDES are DANGEROUS**



Safe Medication Use: Best Practice Deliverables Continued

- ◆ Ensure adherence to policies and processes for safe med administration
- ◆ Continually examine why policies are not followed?
- ◆ Forward questions/concerns to Medication Safety Committee
- ◆ Technology is a tool that supports safe med administration by the health care team
- ◆ **Second license staff verification required for all non-emergency med overrides**



Improvements in Technology

- ◆ New label printer
 - ◆ Thermal printer-no issues with ink fading
- ◆ Upgrade Wireless system
 - ◆ Improved connectivity issues
- ◆ New barcode scanners
 - ◆ No batteries needed-no need to re-synch with battery changes
 - ◆ Reads new symbologies
 - ◆ Do not have to synch with new symbologies
 - ◆ Tethered requires screen to be visible-mobile devices
 - ◆ Wireless charges in base-stationary devices (ICUs)



Results

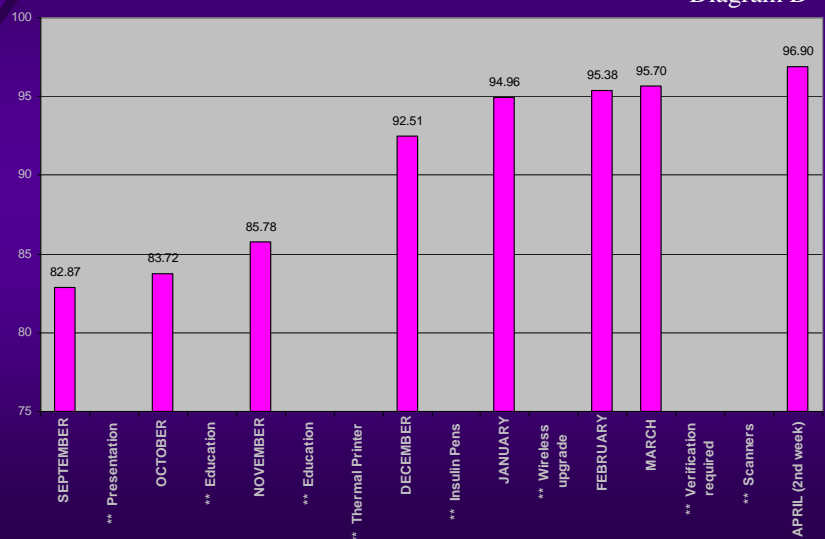
- ◆ Compliance rose from 82% in September 2006 to 97% in April 2007
- ◆ Overrides decreased 67%
 - ◆ From 1,500 per day to 500 per day
- ◆ All units have exceeded 90% compliance
- ◆ Targeted Education demonstrated the largest Improvement in Compliance

Reference Diagram D



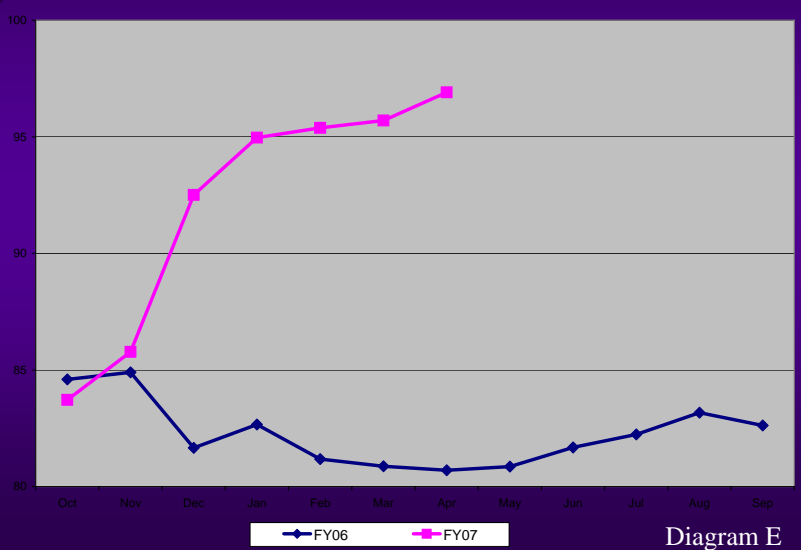
Systematic Improvements

Diagram D



Where are we NOW?

Diagram E





Conclusion:

- ◆ Medication Administration poses one of the greatest risk to patients
- ◆ Technology provides significant opportunity to reduce risk
- ◆ Technology does not replace the need for safe practice
- ◆ Success rest on integrated approaches that enhance processes, While...
- ◆ Emphasizing professional responsibility to patient safety



Insights to Successful Safety Improvements

- ◆ Instill a sense of urgency!
- ◆ Senior leadership support!
- ◆ Whatever it takes to do the right thing for the patient!
- ◆ Commit to team work!
- ◆ Bring out the best in each other!
- ◆ Turn over every rock!
- ◆ Make one change at a time!
- ◆ Communicate and follow-up!
- ◆ Celebrate success!

*A Culture of Excellence is
a Culture of Safety*



Questions?

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