

**Advocacy and Influence**

**Source of Evidence 4 EO**

**Describe and demonstrate one (1) CNO-influenced organization-wide change.**

**Purpose/Background**

VUMC Executive Chief Nursing Officer (ECNO), Marilyn Dubree, MSN,RN, NE-BC is a member of several committees that set priorities for the work of the Medical Center, including the Medical Center Quality and Patient Safety Council and the Clinical Enterprise Executive Committee (CEEC). Four (4) of our six (6) quality and safety performance pillar goals have placed an emphasis on patient safety and decreasing morbidity and mortality. Those four (4) goals include: reduction of O/E (observed to expected mortality), reduction of healthcare associated infections, reduction of adverse events and improving system reliability.

**Table TL 4 EO – 1: VUMC Pillar Goals FY 11**

<b>Goals</b>
<b>Reduce O/E Mortality</b>
<b>Reduce Healthcare Associated Infections</b>
<b>Reduce Adverse Events</b>
<b>Achieve Top Performance in Clinical Programs</b>
<b>Improve System Reliability</b>
<b>Establish Quality Improvement Learning System</b>

[TL 4 EO Exhibit A-1-Quality Pillar Goals Report]

As the ECNO directly responsible for the medical center’s largest workforce and a valued leader, Marilyn is at the forefront of initiating and influencing organization-wide change. In addition, with a track record of supporting an interdisciplinary approach to achieving desired outcomes, Marilyn is frequently the leader in critical organization-wide initiatives that relate to these pillar goals.

Marilyn provided influence and leadership in accomplishing two (2) significant and integrated organization-wide initiatives around these goals. Both of these goals are integrated as they relate to the use of technology to improve patient safety. The computer applications that needed organization-wide implementation included critical lab values reporting and integration of electronic medical record and medication administration dispensing cabinets to support bar code scanning medication administration. Specifically the projects discussed here were: Alerts and Notifications of Critical Lab Values and a change in our automated medication dispensing machines. Both of these initiatives play important roles in the issue of observed to expected patient mortality as well as the other three (3) quality goals.

At VUMC, we are extremely interdisciplinary and nursing has excellent partnerships throughout the Medical Center. Marilyn's relationships and role within the executive leadership team, showcases the many ways that she is able to influence organization-wide change.

Marilyn served as an executive co-sponsor along with Allen Kaiser, MD, VUH Chief of Staff, Professor of Medicine, Vice Chair, Clinical Affairs, Department of Medicine for our work around notification of providers of critical lab values and other emergent issues. A change was needed in response to our own goals and requirements from the College of American Pathologists and JCAHO compliance. The overall issue was to make improvements in system reliability to reduce potential adverse events from delays in addressing critical lab values. The measurement was documentation of the reporting/receipt of the critical lab values.

The overall goals of the project were as follows:

- Provide direct and fast notification to the responsible provider regarding critical laboratory values
  - CAP (College of American Pathologists) defines critical values as those results that may require rapid clinical alternation to avert significant patient morbidity and mortality.
- Decrease Cost and increase efficiency – through improved system reliability
  - Eliminate lab and other personnel in the alerting chain where appropriate – move away from intensive manual labor system
- Increase Standards Compliance
  - Improve documentation of crisis value notification per CAP and JCAHO guidelines.
- **Initial documentation compliance was measured at 23% and we set our goal at 85%.**

Marilyn's voice and influence were critical in the decision-making process and implementation. Initial discussion had focused on the licensed independent practitioners (LIP). As the 24/7 immediate bedside caregivers, nurses plays a key role in the response to addressing critical patient issues. Would the system support the incorporation of the nursing staff and at what juncture? Initial thoughts were that the system would be phased in – which patient care areas and results should take priority? This work involved nursing, medicine, the laboratory, telephone operator services / Call Center, and informatics.

In a related situation to decrease mortality through the automation of medication administration a second objective was set forth and Marilyn served as the committee co-chair for the work of changing our automated medication dispensing system to better support medication safety (reducing the risk of adverse events). Changing from the Pyxis dispensing system to another system (eventually Acudose) involved nursing, pharmacy, respiratory therapy, radiology, informatics, nursing informatics Systems Support and our outside support for electronic documentation – McKesson.

Our previous automated medication dispensing system had been in place for eight (8) years and was at the end of its useful life – requiring replacement. This was the absolute opportunity to evaluate systems to determine the best fit for VUMC. Our need was to get to a standardized system that would interface with our electronic documentation system; support a closed loop scanning system – medications scanned into pharmacy when they enter the building, scanned when stocked in pharmacy, scanned when they are loaded into Acudose and scanned when the nurse removes and then scanned before the patient receives or they are reloaded into the system; bar code medication administration (confirming right med, right patient) and document in the records the medications as they are given. This integration would complete the electronic support of the five (5) medication safety rights thus reducing the risks of adverse events related to medication administration and improving system reliability. Another safety/security measure we wanted to implement which was not supported by our dispensing system was the use of Bio ID (fingerprint ID) for accessing the system.

Focus goals were identified for the project:

- Provides closed loop bar code scanning
- Provides automatic documentation into the current electronic medical record
- Improved screen size
- Safety and security of medications where most are contained in a single compartment
- BioID to provide improved secure access to the system
- Scan to stock to minimize errors in stocking the automated devices
- Addition of cabinets to improve access to medications and proper control of contrast and respiratory medications

## **Alerts and Notifications**

### **Methods/Approach**

An executive multidisciplinary team was put together to map the current method for notification of critical values and to brainstorm possible solutions. In her executive sponsor role, Marilyn also secured key nursing membership on the team.

Decisions were made about use of current systems to reach outcomes, who would be notified and in what sequence, how to prioritize results and areas for phases, education requirements, ongoing audits and monitoring and evaluation.

### **Participants**

Alerts and Notifications Project Executive Team Membership (this work was completed in phases and committee membership varied as the work progressed)

**Table TL 4 EO – 1: Participants**

Name	Title	Role
Marilyn Dubree, MSN, RN, NE-BC	Executive Chief Nursing Officer	Executive Sponsor
Allen Kaiser, MD	VUH Chief of Staff, Professor of Medicine, Vice Chair, Clinical Affairs, Department of Medicine	Executive Sponsor
Pam Jones, MSN, R, NEA-BC	CNO, VUH	Member
Wendy Kiepek	Informatics Center	Member
Wendy Leutgens, MSN, RN	Associate Hospital Administrator, VUH	Member
Neal Patel, MD	Chief Medical Informatics Officer Inpatient VUMC; Medical Director, Pediatric Cardiac Critical Care	Member
Margaret Rush, MD	Chair, Department of Pediatrics; Chief of Staff VCH	Member
Ed Shultz, MD	Director Informatics Technology Integration; Professor, Biomed Informatics	Member
Paul Hain, MD	Associate Chief of Staff; Director of PM&I VCH	Member
Mike Laposata, MD	Pathologist in Chief for Clinical Services	Member
Pat Givens, EdD, RN	Former CNO VCH	Member
Allyson Hobbie	Health Information Services Consultant II	Facilitator
Neesha Choma, MD	Associate Vice-Chair for Clinical Affairs; Director, Quality and Patient Safety, VUH	Member
Shea Polanich, MSN, DNP, RN	Director, Center for Clinical Improvement	Member
Jeremy Kaye, MD	Professor & Chairman, Radiology & Radiological Sciences	Member
Jake Block, MS	Associate Vice-Chairman for Clinical Affairs, Radiology & Radiological Sciences	Member

Martha Miers	Executive Dir, Pathology Laboratory Services	Member
Julia Morris, JD, RN	Deputy General Counsel	Member
Racy Peters, MSN, RN	Associate Director, VMG	Member

## Outcomes

**Initial documentation compliance was at 23% and we set our goal for 85%. That goal has been surpassed with close to 100% per month continuously. Please refer to tables below.**

Implemented what is known as the Alerts and Notifications Systems which is an automated system that notifies clinicians in real time about significant clinical events across multiple teams/departments. The lab calls the unit and speaks to the patient's nurse. At the same time, the LIP and the unit charge nurse receive text messages about the critical value. The LIP is given an ID number that is used when an acknowledgement phone call is made to the system. The charge nurse's message identifies which LIP team the message was sent to. The LIP has 10 minutes to acknowledge the notification and at that same time, the notification/acknowledgement is documented in the patient record.

If the LIP does not acknowledge the alert within the 10 minute window, by either accepting or rejecting (not my patient); the "Alert System" escalates the alert to the Operator in the Vanderbilt Call Center. That operator contacts the provider and the nurse and documents alert acknowledgement in the medical record.

## System Overview

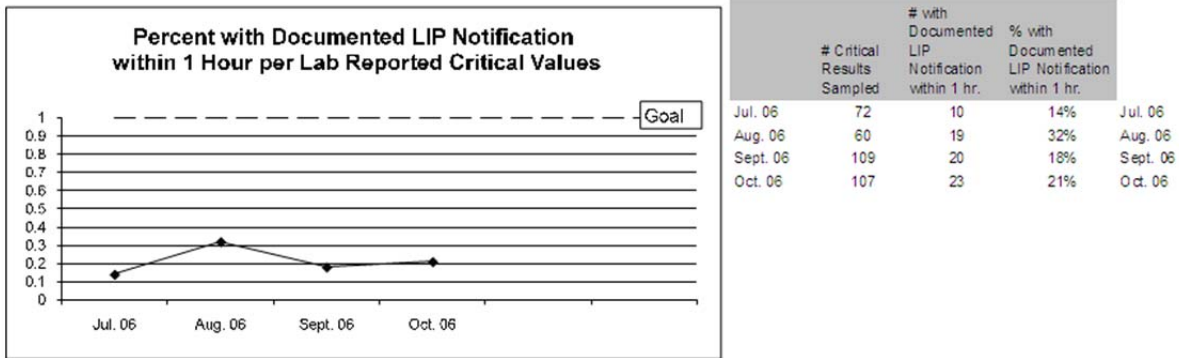
- Notifies providers about critical lab values via the team pager
- Requires confirmation of the alert receipt
- Confirmation by phone (dialing acknowledgement code)
- Confirmation via web application (link in StarPanel or HEO System)
- Escalates alerts that have not been acknowledged by paged provider within 10 minutes to Operator Services in the Call Center
- Transmits a JCAHO compliant event report to StarPanel
- Provides Alerts Monitor and Status Dashboard web applications for Lab and Operator Services to monitor critical alerts status and document acknowledgement
- Operates 24/7

The core of the system is the technology that ensures active, fail safe communication, instant documentation, automatic tracking of alerts and reporting.

Initial work began on this project in August 2008. **Initial documentation compliance was measured at 23% and we set our goal at 85%.** Full implementation occurred in June of

2009 after some pilot testing. The graph and tables below show the initial data and the sustained achievement.

**Graph TL 4 EO – 1: Early analysis of LIP Notification within 1 hour of Critical Lab Values**



**\*\* Initial analysis of data showed results to be an average of 23%**

**Table TL 4 EO – 2: Alerts and Notification System Results - July 2009 – March 2010**

Paged Alerts	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	FY 2010 YTD
Provider Paged Lab Alerts	961	1,470	1,659	1,895	1,828	1,648	1,722	1,393	1,443	14,019
Provider Paged Lab Alerts Acknowledged by LIP w/1 hour	851	1,312	1,481	1,685	1,599	1,438	1,427	1,144	1,261	12,198
Operator Delivered Paged Lab Alerts to LIP w/1 hour	65	76	89	96	86	92	89	59	51	703
Total Provider Paged Lab Alerts Acknowledged by LIP w/1 hour	916	1,388	1,570	1,781	1,685	1,530	1,516	1,203	1,312	12,901
Rate of Provider Paged Lab Alerts Acknowledged by LIP w/1 hour	95%	94%	95%	94%	92%	93%	88%	86%	91%	92%

**Table TL 4 EO – 3: Alerts and Notifications System Results – June 2010 – May 2011**

Paged Alerts	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11
Provider Paged Lab Alerts	1524	1509	1369	1342	1434	1256	1275	1273	1332	1469	1293	1318
Provider Paged Lab Alerts Acknowledged by LIP w/1 hour	1321	1266	1178	1124	1240	1065	1056	1124	1137	1235	1023	1106
Operator Delivered Paged Lab Alerts to LIP w/1 hour	34	50	41	63	37	24	30	27	40	40	37	44
Total Provider Paged Lab Alerts Acknowledged by LIP w/1 hour	1355	1316	1219	1187	1277	1089	1086	1151	1177	1275	1060	1150
Rate of Provider Paged Lab Alerts Acknowledged By LIP w/1 hour	88.91%	87.21%	89.04%	88.45%	89.05%	86.70%	85.18%	90.42%	88.36%	86.79%	81.98%	87.25%
Total Operator Delivered Paged Lab Alerts w/1 hour	203	242	190	217	191	191	216	149	194	234	269	212
Total Provider Paged Lab Alerts Acknowledged w/1 hour	1524	1508	1368	1341	1431	1256	1272	1273	1331	1469	1292	1318
Total Rate of Provider Paged Lab Alerts Acknowledged w/1 hour	100.00%	99.93%	99.93%	99.93%	99.79%	100.00%	99.76%	100.00%	99.92%	100.00%	99.92%	100.00%

**\*\* Initial documentation compliance was at 23% and we set our goal for 85%. That goal has been surpassed with Total close to 100% per month continuously.**

[TL 4 EO Exhibit B-1-Minutes Lab Alerts Executive 10-22-08, TL 4 EO Exhibit B-2-Minutes Lab Alerts Executive 09-04-09, TL 4 EO Exhibit B-3-Lab Alerts Executive Presentation 04-29-10, TL 4 EO Exhibit B-4-Alerts & Notifications System Project Presentation 06-15-11]

In addition to achieving this aspect of the goal, a second tier application of patient safety was the Acudose Medication System

### **Acudose Medication System**

#### **Methods/Approach**

A steering committee was formed and chaired by Marilyn Dubree to provide oversight and planning for the Acudose project. Sub-groups were used for specific tasks/phases of the work. The group decided to evaluate the three (3) major vendors of automated dosing machines (ADMs) to determine how to best accomplish our goals. RPFs were evaluated from the three vendors and presentations and cabinet demonstrations were provided on site. Lead by Vicki Thompson, MSN, RN and Mike Daly, MSN, RN, NE-BC, the nurses (200 plus) and other staff (IT, pharmacy, radiology, respiratory therapy, etc.) evaluated the vendors, completed surveys and one vendor was eliminated. References were obtained for the final two vendors and IT completed a thorough evaluation related to integration and their ability to meet our needs. Another group of nurses (200 plus) evaluated the final two (2) vendor's products.

The project required a complex and comprehensive change in a short period of time. The implementation was done in phases with close coordination among the multiple groups.

Marilyn's leadership in this work proved critical in relation to several barriers and problems that occurred:

- negotiations about time line within the organization and with the vendor when faulty cabinets had to be replaced
- coordination with the company and IT about the timing of the integration of the systems
- advocating for the capital dollars in order to obtain the features of the system needed to support the goals
- facilitating policy changes that affected the entire organization and changed medication practices to enhance best practices and not just for nursing
- negotiating future upgrades for the system and next steps

#### **Participants**

**Table TL 4 EO – 4: Participants**

<b>Name</b>	<b>Title</b>
Marilyn Dubree, MSN, RN, NE-BC – Facilitator	Executive Chief Nursing Officer
Anna Ambrose, MHA, BS, RRT	Administrative Director, Respiratory Therapy
Cheryl Burney-Jones, BS RRT	Associate Director, Respiratory Therapy, PEDS

Michael Daly, MSN, RN, ACNP-BC, NE-BC	Assistant Administrative Director, Trauma & Surgery Patient Care Center
John Doulis, MD	COO, Informatics General & Administration
Carol Eck, MBA, RN	Administrative Director, Cancer Center
Sheree Foster, BS, Pharmacy	Compliance & Process Improvement Manager, Pharmacy
Pat Givens, EdD, RN	Previous CNO, Vanderbilt Childrens
Lisa Grunwald, RN	Systems Support Specialist I
Jim Hayman, Pharm D	Administrator, VUH Pharmacy
Steve Huffines, Pharm D	Director, Pharmacy Business Services
Karen Hughart, MSN, RN, CIN	Director, Systems Support Services
Jenny Slayton, MSN, RN	Administrative Director, PM&I, Vanderbilt Childrens
Pam Jones, MSN, RN, NEA-BC	VUH Associate Hospital Director and CNO VUH
Brent Lemonds, MS, BS, RN, EMT, FACHE	Administrative Director, Adult Emergency Department, LifeFlight and Trauma Services
Wendy Leutgens, MSN, RN	Associate Hospital Director, VUH
Leslie MacKowiak	Director, Computer Administration, Medical Center
George McCulloch	Deputy CIO Information Management
Mark Sullivan, Pharm D	Director, VUH Pharmacy Operations
Robert Sentell	Coordinator, Pharmacy Contracting
Vickie Thompson, MSN, RN	Manager, VCH Special Projects
Chris Wilson, MSN, RN	Director, VUH Nursing Education & Professional Development
Elizabeth Humphreys, Pharm D	Director, VCH Pharmacy Operations
Lynn Price, BSN, RN	Manager, Patient Care Services

### Outcomes

A seven (7) million plus project was implemented within a 6 month time frame, with approximately 5,468 users trained and 6 of the 7 goals realized.

[TL 4 EO Exhibit C-1-Acudose Purchase Reqs, TL 4 EO Exhibit C-2-VUMC Acudose Amendment Contract FINAL, TL 4 EO Exhibit C-3-Acudose Training 03-06-09]

**Table 4 EO – 5: Acudose Project Costs**

Approximate Acudose Project Cost		
	Lease	Maintenance
Original Replacement	\$6,453,785	\$1,237,620
CCT Add	\$715,873	\$177,060
FBI Add	\$77,687	\$20,040
Total 5 Year Cost	\$7,247,345	\$1,434,720



Goals recognized:

- Closed loop bar code scanning
    - The final part of this the staff member scanning if they restock a medication (happens infrequently) – this will be recognized in the next release of the product
- Our medication administration scan rates were addressed in the first document in OO 23 and EP 32 EO. Scan rates are above 95% (benchmark is 80%).*
- When medications are scanned at the bedside (medication and patient armband) there is automatic documentation in the electronic medical record (HED) that the medications have been given
  - Approximately 40 new locations have been added to the cabinets improving secure and safe access to medications
  - Significant improvement in the control and storage of contract media and respiratory meds
  - Expiration date tracking is activated on all cabinets to enhance removal of out of date products
  - Improved restock process with scan on restock
  - The goal of using BioID to provide improved secure access to the system is not being utilized effectively (about 50%) and is currently being addressed

**Additional issues addressed with positive outcomes:**

Multiple requests were received to extend Acudose access due to contrast media and other medications and for re-stocking. This came from several departments related to their technicians: including the endoscopy lab, radiology, cardiac cath lab, and operative services. In addition, a request was made to grant access to the Medical Receptionists on the inpatient units so they could check and document refrigerator temperatures.

An assessment to address these issues included a thorough review of the following:

- ISMP Safety Self Assessment for Automated Dispensing Devices
- Tennessee State Board of Pharmacy Rules
- JCAHO Standards
- VUMC policies related to medication cabinets, medication storage and handling and administration and documentation
- Current Acudose access for non-licensed staff
- Job descriptions for specified titles requesting access to Acudose

**Outcomes from the above issues:**

- Limited Acudose access to pharmacists, pharmacy technicians and those authorized to administer medications and in addition each group is limited to the medications they are authorized to administer
- Reviewed and updated job descriptions of all groups to include language about access to medications where appropriate
- Purchased refrigerator thermometers with an external display for all refrigerators with a remote lock. Cost was approximately \$20.00 each.
- Updated all VUMC policies as appropriate and referenced to indicate authorized personnel
- Requested modification to Acudose to limit the witness of controlled substance waste to those who have been granted access to these medications

[TL 4 EO Exhibit D-1-Acudose Access SBAR Revised 01-27-10]

We have some goals that we continue to work on with Acudose and the integration of our systems to support the pillar goals. The success of the Acudose implementation was possible due to the leadership and influence of Marilyn. She continues to provide leadership and advocacy in the further integration of Acudose and our systems.

[TL 4 EO Exhibit E-1-Agenda Steering Committee 01-05-09, TL 4 Eo Exhibit E-2-Agenda Steering Committee 04-06-10, TL 4 EO Exhibit E-3-Acudose Update Kick Off Presentation, TL 4 EO Exhibit E-4-Integration with ADM-Care Organization]

**Clinical Effectiveness/Appropriateness of Care**

The goal of decreasing O/E mortality is expressed in the graph below. Emphasis is on reducing observed mortality. Our goals are: Threshold 0.76; Target 0.73; and Reach 0.71 (lower is favorable). We are currently at 0.72 which is at Target. Our current rank among the UHC Capture Peer Group Comparison is 5<sup>th</sup>. The work of the Alerts/Notification group and the addition of a closed medication loop with the implementation of Acudose have contributed to the decrease in observed to expected mortality in our patient populations.

[TL 4 EO Exhibit F-1-Quality Pillar Metrics]

Graph 35 EO – 2: Current O/E Mortality showing downward trend

