

Quality & Safety

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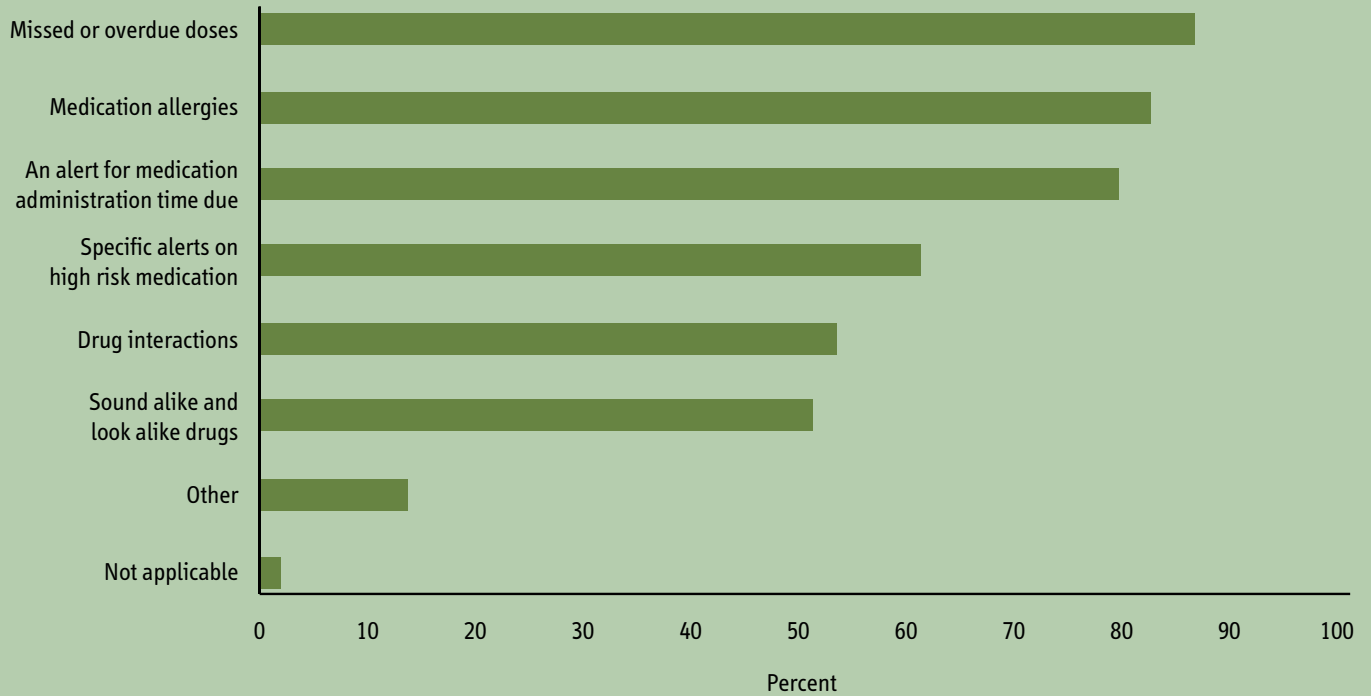
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Does practice make perfect?

Projects Enhance Medication Safety in New York State Hospitals

INTRODUCTION

According to a 2006 report by the Institute of Medicine, medication errors are among the most common medical errors in the nation today, affecting at least 1.5 million people each year⁽¹⁾. Indeed, mistakes may happen at every step of the medication management system, from prescribing and transcribing, through preparing and dispensing, to administering and monitoring patient response. The report estimates that on average, at least one medication error occurs per hospital patient per day, although error rates vary widely. The extra medical costs of treating drug-related injuries occurring in hospitals alone conservatively amounted to \$3.5 billion a year, and this estimate did not take into account lost wages and productivity.

In response to this trend, hospitals throughout New York State have made an organizational commitment to improve medication safety. When viewed from a statewide perspective, these activities reveal a broad range of quality improvement strategies.

BACKGROUND

As part of a 2008 out-of-court settlement between the New York State Attorney General's Office and Cardinal Health, Health Research Incorporated (HRI) received funding to promote studies, research and public education on pharmaceutical safety. HRI is a not-for-profit corporation affiliated with the New York State Department of Health and Roswell Park Cancer Center.

This newsletter reports on two grant-funded projects. The first inventoried medication safety practices at New York State hospitals, utilizing a two-step process: a statewide survey of pharmacy



directors, and 41 on-site visits at facilities located throughout the state. This investigation led to the development of a medication safety practices maturity model; a catalogue of leading practices; and a “lessons learned” tips sheet. In a second project, 19 New York State health care facilities received funding – up to \$300,000 each – to implement organizational level projects in medication safety systems. Project activities pertained to: patient and provider education, studies and research; clinical pharmacy services; and, information technology.

In addition to providing an overview of these two projects, this newsletter contains several links to medication safety leading practices catalogue; “lessons learned” tips sheet – an assortment of useful observations/tips that were derived while hospitals implemented new medication safety processes; medication safety practices maturity model; and, project descriptions from the 19 health care facilities awarded funds to enhance pharmacy safety systems.

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Does practice make perfect? *(continued)*

PROJECT ONE

INVENTORY OF MEDICATION SAFETY PRACTICES

Step 1

In mid-2009, the New York State Health Department Patient Safety Center (PSC) contracted with Deloitte Consulting to develop an inventory of hospital-based practices associated with medication safety. As a first step, 189 hospital pharmacy directors, who represented 218 hospitals statewide, were invited to participate in a voluntary online survey, soliciting information on their medication safety programs. One hundred and forty nine hospital pharmacy directors representing 177 hospital pharmacy sites completed the survey – an overall response rate of 81 percent. Facility response well represented geographic regions throughout the state, as well as bed size and type of hospital (teaching versus non-teaching).

The survey assessed numerous elements divided into a variety of categories, including: medication safety plan and executive

involvement; root cause analysis; tracking of near misses; computerized physician order entry (CPOE) and physician decision support tools; electronic medication administration records (eMAR) and alert functions; bar-code medication administration (BCMA); smart pumps; regional health information organizations; and others. Survey responses were treated as strictly confidential.

From the pool of hospitals responding to the survey, 41 facilities were chosen to participate in the second step of the project: a one- or two-day onsite visit to further explore medication safety practices with respect to the key processes of a comprehensive medication management system. Selected hospitals were evenly distributed across all regions of the state, and across facility sizes.

Step 2: Site visits

During the winter of 2010, teams of reviewers visited 41 New York State hospitals. They interviewed individuals in such pivotal roles as Pharmacy Director, Chief Information

Officer, Director of Performance Improvement, Chief Nursing Executive and Risk Manager. Multiple departments within each facility were visited, addressing services such as procurement, prescribing, transcribing, labeling, dispensing, distribution, administration and monitoring.

Afterwards, the project team developed a three-tier model to stratify medication safety practices along the maturity continuum. The model offered examples of safety practices that demonstrate three escalating levels of organizational maturity. **(A copy of the full model appears here.)**

Ultimately, the analysis led to the development of a catalogue of leading medication safety practices, divided into the two dozen-plus groupings listed below.

PROJECT HIGHLIGHTS

New technologies

Advanced technologies have been shown to reduce medication errors and improve patient safety. All hospitals responding to our survey reported that technology positively impacted medication safety, with easier identification of the sources of errors and increased awareness among personnel as the most beneficial effects. Eighty percent of respondents indicated that technology reduced the number of errors, or the impact of errors.

Survey findings also revealed:

- Smart pumps were utilized by 63% of hospitals, and almost all facilities using smart pumps (97%) utilized the drug library functions.
- eMAR, was the most widely used technology, utilize in 40% of responding hospitals.
- The majority of facilities with eMAR used its full potential, incorporating four or more alert functions **(Figure page 2).**



CATEGORIES OF LEADING PRACTICES

The full catalogue of medication safety leading practices appears [here](#).

Anesthesia/intraoperative

Bar-code medication administration (BCMA) Chemotherapy

Clinical Pharmacists

Communications Community Outreach Culture

Data Analysis

Decision Support

Dispensing

Education

Electronic Medication Administration Record (eMAR) Forced Function

High-risk Medications

Insulin

Medication Administration

Medication Reconciliation

Overrides

Pediatrics

Physician Involvement

Prescribing (Computerized Physician Order Entry, CPOE) Prescribing

Process Change

Reporting Smart pumps Standardization Teamwork Technology

Technology Implementation

- Approximately one-third of hospitals had Computerized Physician Order Entry (CPOE) for medication ordering. Of facilities with CPOE, 55% had CPOE throughout the entire hospital. Hospitals with CPOE were largely teaching hospitals (67%).
- Although the majority of hospitals had bar-coding technology, it was largely limited to purchasing and inventory purposes. Less than one quarter (19%) used BCMA with bar code scanning the patient's wristband and medication at the bedside.

During the site visits, several hospitals referenced the importance of planning for the implementation of advanced technologies. Some mentioned the lengthy period of

time required – in some cases 12 - 24 months – to prepare for and implement new technologies. Others suggested piloting new systems with a small, well-defined patient population.

Technology provides a good opportunity to illustrate our leading practice maturity model. In a level 1 safety practice, for example, a single drug library platform might be used in all systems, including CPOE, the pharmacy dispensing system, drug administration system and smart pumps. In a more developed level 2 practice, you might also find system alerts have been reviewed and prioritized to avoid alert fatigue (and less critical alerts have been removed). System alert overrides and workarounds might be monitored on a monthly basis. Override information

could be used to make further adjustments as well. In an example of a level 3 practice, a hospital might participate in a Regional Health Information Organization (RHIO), either posting or receiving medication information between community and facility providers, for example.

Clinical Pharmacists

The deployment of clinical pharmacists on patient care units is another safety practice associated with a reduction in medication errors. Pharmacists in a clinical role have been shown to reduce costs as well. Our survey revealed a clear trend towards an increased role of clinical pharmacists in all practice settings, with less emphasis on their distributive functions. A majority of pharmacists (nearly half) had a 40% clinical/60% distributive split to their daily functions. Almost one-quarter of pharmacists functioned in a 100% clinical capacity.

During the site visits, hospitals also described several other benefits to the use of clinical pharmacists, including the opportunity for multi-disciplinary rounding, and collaboration between clinical pharmacists and the medical team improves the use of target drugs.

Culture of Safety

To understand the potential causes of medication error, it is important to consider the dynamics of health care as a system, influenced by individuals and organizational attitudes, often described as its "culture." A health care organization with a strong culture of safety focuses on systems, emphasizes teamwork, and takes proactive steps to identify and correct operational weaknesses. When such an organization investigates an occurrence, what, rather than who, is the major focus of the process.

Culture of safety is another subject that showcases our leading practice

(continued)

Does practice make perfect? *(continued)*

maturity model. In a facility that demonstrates a level 1 practice, for instance, senior leadership's involvement might include a patient safety officer coordinating hospital-wide safety improvement initiatives. In a hospital with a level 2 practice, senior leadership might conduct patient safety walking tours. In a facility with a level 3 practice, the Board of Directors might actively engage in discussions of medication safety and error prevention through

regular reports from the Patient Safety Officer/Senior Leadership. In another level 3 example, a facility's "Just Culture" policy would clearly define human error versus reckless behavior and specify the proper response to each.

Leading practices associated with a culture of safety reported by facilities included:

- ▶ Creating a low-cost safety training video to show steps leading up to a patient safety

incident; the video served as a catalyst to examine all aspects of the medication use process and institute major changes, including new technologies.

- ▶ Establishing "Patient Safety Fridays," a form of tracer rounds, that involves senior leadership, reinforcing the goal of safety with a dedicated time.
- ▶ Empowering any staff member or clinician to call a halt to any process they feel is unsafe.
- ▶ Recognizing staff for outstanding efforts with unique awards and using praise as an important part of building a safe culture.

Hospitals report that with engagement from senior leadership, a great deal of positive progress can be made in a short period of time.

WHAT THEY WISH THEY'D KNOWN THEN: "LESSONS LEARNED"

Through extensive conversations with hospital personnel from many different departments, investigators were also able to compile an assortment of useful tips – a legacy of real-world experience derived while implementing new medication safety processes. We believe these 'pearls of wisdom' represent a series of concerns/solutions that facilities 'know now and wish they'd known then.' For instance, hospitals learned to:

- 1) predict demand for more power outlets when more computers are rolled out
- 2) engage physicians early – give them responsibility for implementation and guide progress with data outcomes and
- 3) do not accept "working as designed" as an answer if the process does not support the way clinicians think.

The complete [Lessons Learned Tip Sheet](#) appears [here](#).



PROJECT TWO

PROMOTING PHARMACEUTICAL SAFETY SYSTEMS

The second of these two medication safety projects focused on efforts by individual health care facilities (or, in some cases, collaborations) to enhance medication safety systems. As mentioned previously, the grant awarded funding to advance leading practices, promote studies and research, and public education on pharmaceutical safety of particular importance to public health. Projects could last up to 18 months.

To ensure a fair and widespread distribution of funds, evaluation criteria allowed for regional variation. Forty applications for funding were reviewed. Ultimately, 19 facilities received funding; individual awards ranged from \$50,000 to \$300,000 and totaled \$3.9 million. Some of the initiatives to receive awards are briefly described below.

Technology-related initiatives

Proposals with a health information technology (IT) component were of special interest to the department. Several awardees used funds to investigate/support health information technologies. Among them:

Bronx-Lebanon Special Care Center advanced safe prescribing practices for vulnerable populations (the elderly and HIV positive adults) using health information technology and health information exchange in long-term care facilities. They implemented a Computerized Physician Order Entry (CPOE) system and e-MAR for nursing.

University at Buffalo (Medication Management Research Network) evaluated the efficacy of several medication management approaches: tele-pharmacy for centralized medication review; integration of health information exchange data; digitalization of medication profiles;



and, others. They also piloted a demonstration project to compare medication dispensing accuracy between the “standard of care” dispensing system and a seamless, integrated prescriber-pharmacy network utilizing barcode and/or smart card technology.

Island Peer Review Organization (IPRO) captured real-time data to investigate problems encountered with prescriptions presented to pharmacies in close proximity to large academic medical centers. They utilized a Technical Expert Panel to characterize the clinical impact of the problems and determine whether e-prescribing technology is capable of addressing the most frequently encountered problem types.

Massena Memorial Hospital implemented a point-of-care barcode medication administration system. The award supported the implementation and training component, thus ensuring a smooth and successful transition to a computerized systems approach to medication management.

St. Joseph’s Hospital utilized a computerized surveillance program based on defined triggers to identify/intervene with high-risk patients on anticoagulation therapy progressing toward a negative outcome.

South Nassau Communities Hospital, among other educational activities, piloted the use of remote medication monitoring devices for home care patients who met certain medication management risk criteria.

Clinical pharmacists

Another subject of considerable interest among grantees was the deployment of clinical pharmacists to improve the medication reconciliation process especially when working in collaboration with community partners. Among the facilities who received funds to utilize clinical pharmacists:

Champlain Valley Physicians Hospital Medical Center employed a clinical pharmacist, in collaboration with community partners, including the Clinton County Health Department and the Clinton County Office for the Aging, to improve the completeness and accuracy of the medication reconciliation process for admissions and discharges.

Jamaica Hospital Medical Center initiated a multi-disciplinary collaboration to evaluate the efficacy and cost effectiveness of a Pharmacy Consultation Service for patients discharged from the Transitional Care Unit/Rehabilitation Unit to community/home health care.

Kingsbrook Jewish Medical Center provided a clinical pharmacist to respond to drug queries (in person, or by telephone, mail and email) from health care professionals and community residents in their service area. For each inquiry, drug information questions were entered into an intervention database which enabled automatic capture and reporting of required data, such as medication errors, adverse drug events, number of physician office and emergency department visits prevented.

Pharmacy internal processes

Other grantees used their awards to address specific processes within their pharmacies. The following are two examples:

Northeast Health (Albany Memorial and Samaritan Hospitals) used the Lean tool “Value Stream Mapping” to review pharmacy workflow and develop a work plan to allow more time for medication reconciliation. Daily huddles with assignments were instrumental in directing the department. The team received real-time information to improve the rate of medication reconciliation.

SUNY Upstate University Hospital evaluated “controlled packaging” in a hospital pharmacy

to determine if it would reduce filling and dispensing errors with the potential for serious adverse events. Controlled packaging is defined as packaging or re-packaging of small volume parenterals under controlled conditions to ensure that contents are consistent with external labeling. They also studied the cost effectiveness of the strategy to determine its potential for sustainability and replication.

[An overview describing all 19 pharmacy safety systems projects can be found here.](#)

CONCLUSION

Patient safety is an integral component of the delivery of quality health care. As such, hospitals across New York State have made an organizational commitment to medication safety, designing systems and implementing processes aimed at preventing adverse events. And yet, it is impossible to prevent all errors. In the realm of medication safety, practice does not make perfect. Even practices do not make perfection. However, it is possible to combine multiple practices in such a way that any one error does not result in patient harm. In other words, a carefully designed safety program, while falling short of

perfection, brings us infinitely closer to that lofty yet elusive goal.

Obviously, not all pharmaceutical safety efforts are created equal. The Institute of Patient Safety (ISMP) says error-prevention strategies designed to fix the system have a broader, more lasting impact (high-leverage) than those directed at changing individual behavior (low-leverage). To learn more about ISMP’s high leverage error-reduction strategies, visit <http://www.ismp.org/Newsletters/acute/acute/articles/19990602.asp>. ISMP also provides a medication safety self-assessment that provides facilities an opportunity to identify areas in need of higher leverage strategies.

Whichever IT or other strategies your hospital may be considering, please remember that communication between nurses, prescribers and pharmacy remains of utmost importance. Staff utilizing IT solutions needs to thoroughly understand all safety features, such as alerts, and not engage in efforts to bypass those valuable elements.

These projects sought to enhance medication safety by investigating and/or implementing performance-improvement practices. Of course, every health care system is unique, with its own labyrinth of people and processes; methods that succeed in one facility may not be applicable to others. Based on our findings, however, the work of reducing medication errors typically begins when an organization firmly commits to creating an environment where patient safety is a top priority. And, all hospitals – large or small, community-based or academic, rural or urban – can take ownership of medication safety.

REFERENCES

1. Preventing Medication Errors, Institute of Medicine report, 2006.





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APPENDIX A

Leading Practices Catalogue

Anesthesia/ Intra-operative

Medication Time Out is required before and during surgery for any medication introduced to the sterile field

Toxic dosage into the sterile surgical areas is forbidden. The maximum dose allowed onto the sterile field is specific to patient weight

Bar-Coded Medication Administration (BCMA)

Use American Hospital Association (AHA) assessment tool for technology in preparation for BCMA (12 months preparation)

Purchase scanners that can work on multiple bar code types. When a scanner is inoperable, it becomes a level 1 priority and moves to the top of the queue

Items that are selected not to be scanned for either infection control or dosage change reasons require confirmation by two nurses (e.g. insulin infusions and heparin dose changes)

Had a novel educational program, using a “Zebra-Stripes are in!” title and a BCMA mascot. A reward contest with a plush animal zebra was given away as an incentive for participation

Required a mandatory competency, using the “Zebra-Stripes are in!” program, which must be completed prior to using the system (passing medications)

Initially implement BCMA with a defined patient population and with a limited number of medications (Respiratory Therapy)

Decentralized pharmacy technicians who work closely with nursing on specific units serve as BCMA liaison to ensure proper medications are available, facilitate medication storage and transport, and coordinate patient-administered drugs and medication inspections

To facilitate BCMA, a nurse resides within pharmacy to serve as liaison

BCMA process was rolled out over a 12 month period of time, with two weeks in between each go-live

Nurse liaison in pharmacy supports BCMA and computerized physician order entry (CPOE)

Chemotherapy

Require two pharmacists to double check calculations that are performed manually. Compare the drug label to the physician order or protocol

For pharmacy verification of orders, the medication profile shows all visits and all orders in one view to ensure that the prescribed orders match the intended protocol and that cumulative doses have not been exceeded

Mandated the use of preprinted order form creates the standardization needed to ensure that the safety checks are done each and every time by all practitioners

Standardize and automate Pediatric TPN and Standardized Infusion calculations to eliminate errors

Clinical Pharmacists

Deployment of Clinical Pharmacist in Emergency Room, Pediatrics and other clinical areas improves care and reduces costs and errors

The collaborative impact of Clinical Pharmacists and the medical team improves the use of target drugs

Pharmacy can order Vancomycin levels through a collaborative agreement

Decentralization of pharmacists has allowed for multidisciplinary rounding on the Med/Surg units

Clinical pharmacist work queue uses markers programmed into the pharmacy system. Prompts are developed for specific tasks and this self-developed system uses the dispensing system to organize the clinical pharmacists work and allows for tracking of work task

Communications

Electronic “hold acknowledgement” reduces miscommunication between clinicians and the pharmacy

Conduct monthly Safety Rounds in a conference format with the Associate VP for Safety and Quality

Full-time safety nurses provide a point of contact for front line staff to communicate concerns

Cultural transformation that features front-line staff involvement in medication safety via safety cells that report up through a safety infrastructure with access to the senior leadership and the Board of Directors

Used Susan Sheridan video to increase awareness of patient safety http://www.who.int/patientsafety/information_centre/interviews/sheridan/en/index.html

Weekly safety rounds to keep safety top of mind

Medication tracer rounds where each step of the medication use process is evaluated by a team comprised of the health system Chief Medical Officer, the CNO and the Pharmacy

Used Situation-Background-Assessment-Recommendation (SBAR) technique for communicating about a patient within a health care team

ARC: Ask, Response, Command. This practice allows and supports staff to move “up the chain of command” to seek a satisfactory answer if they do not receive one from a physician, and avoids passive acceptance of physician errors

Nursing uses a printout of all undocumented medications as a handoff for the shift to shift report

Community Outreach

Community drug drive to safely dispose of expired and unused medications was highly successful. This annual initiative was conducted with the approval of local and state law enforcement authorities and led to the safe and appropriate disposal of over five tons of medications. The success was due to community marketing and collaboration with local and state authorities to obtain the requisite licenses and to hand over the drugs to the hospital

Developed a health card (a medication list wallet card) and the Vial for Life (list of medications in a green Rx vial placed in the patient’s refrigerator for EMS retrieval) to facilitate medication reconciliation

Pharmacist involvement in patient counseling can promote better patient outcomes

Culture

Report safety issues to the Board of Directors, CEO and Executive Committee of Medical Staff. A culture of safety with supporting governance structure promotes implementation and accountability for medication safety efforts

Comprehensive safety culture uses the existing committees of the hospital, making safety a primary focus

Medication Safety Plan is responsibility of VP of Patient Care Services, who in turn reports directly to the CEO and the Board of Directors

Comprehensive PI Oversight committee to prioritize and address medication safety issues

Focus on culture with proactive remediation of potential medication errors can make demonstrable improvements in a limited technology environment (no CPOE, BCMA or EHR)

Cultural transformation that features front-line staff involvement in medication safety via safety cells that report up through a safety infrastructure with access to the senior leadership and the Board of Directors

High-level guidance and sponsorship of medication safety planning and implementation by senior leadership and the Board of Directors

Medication safety infrastructure featuring Medication Safety Officer and unit-based medication safety champions; committees that incorporate front-line staff input and assign accountability for medication safety throughout the organization

Development of a non-punitive and collaborative culture that begins with leadership and involves everyone in patient safety and medication safety

Use nursing instructions: nurses to call pharmacy anytime they are uncomfortable with a dosage or medication they are about to administer

Have a patient on the Patient Safety Committee

Include a patient on the Pharmacy Quality Assurance Committee

To encourage staff participation in issue resolution, provide them with paid time for meeting work regarding medication management

Develop a supportive reporting culture by encouraging near miss reporting and giving awards such as “caught being great”

“Just Culture” that empowers any staff member or clinician to call a halt to any process they feel is unsafe. “Stop the Line” is practiced

Have a patient safety nurse who rounds daily who can serve as a trusted advisor to front-line staff

Include front line staff (pharmacists and nurses) in a Medication Safety Council

Patient Safety Fridays, a form of tracer rounds, involves Senior Leadership, reinforcing the goal of safety with a dedicated time. The day includes didactics, tracer rounds, staff teaching and feedback, and discussion of the findings

Data Analysis

Proactive tracking of ADC data to identify adverse drug reactions

Decision Support

Extensive use of decision support in CPOE with standardized order sets and decision support tools that provide point of entry alerts/warnings; required to complete review of safety check lists, risk factors and indications before orders are authorized

Risk vs. benefit of high-risk medications built into preprinted orders force the prescriber to weigh the need for the high-risk medication (e.g. anticoagulation)

Dispensing

Outsourced off-site pharmacy services provide 24/7 pharmacist review of orders enabling the electronic medication administration records (eMAR) to be up-to-date with current orders. Fully utilizes the eMAR functionality and can improve turnaround time while increasing safety

Use a bar code for medication delivery to medication cart to ensure delivery to the correct patient. This process calls for medications to be delivered by pharmacy to patient care unit using a bar code, thereby reducing errors and improving communication

Institute formulary changes to a therapeutic equivalent when sound alike errors are repeated

Use Bar Code scanning for replenishment of ADCs

Pharmacy enforces a “no dispense” policy for orders with unapproved abbreviations

Use bar code medication verification for refilling of ADCs

Nursing is not permitted to restock a medication in an ADC, it must be placed in the returned medication bin for pharmacy to restock using bar code technology

Education

Developed safety training video showing steps leading up to a patient safety incident. Used digital camera and basic software to create training video at a very low cost; this video was the catalyst to examine all aspects of the medication use process and institute major changes with BCMA and smart pumps

Chief Resident is responsible for providing continuous feedback to Medical Residents

House staff has a quality council that meet monthly to discuss issues from the front line and are empowered to resolve issues

House staff has a Resident Patient Safety Officer which is a stipend position

Electronic Medication Administration Record (eMAR)

Initiated campaign titled “eMAR= every Medication Always Right”

Forced Function

BCMA is a “forced” function—the only way to pass medications is by scanning the medication using Computer on Wheels. Eliminated the opportunity for a paper-based work around

Have a number of hard stops built into the anticoagulation process. Without an INR, anticoagulants cannot be ordered

All leadership, physicians and staff are trained on organization-wide “Red Rules” whose violation stops all processes of care until addressed. Mandatory compliance with these rules is supported throughout the organization to empower staff and promote safety

Proactive changes in CPOE so that errors in prescribing cannot happen again, and make changes in CPOE within 24 hours due to near misses

Specific care tags or markers were developed within the system as reminders (e.g. vaccines, Warfarin INR markers) to increase compliance with core measures and other mandatory duties that require standardization

High-Risk Medications

High-Alert Emergency drug kit with instructions and drug usage info for infrequently used medications – this idea is replicable in all hospitals regardless of service line or size

Comprehensive Pyxis safety alerts programmed for high-risk medications, antidotes and sound alike, look alike drugs (SALAD)

Admixture products were reviewed for risk mitigation strategies. Specific plans were developed to reduce the risk of use

High-Risk Medications ordered immediately have pharmacist review prior to administration

Hydro-morphine warning in ADC: Warning this medication is seven times more potent than morphine

Institute a national initiative to reduce look-alike errors with eye and ear drops

Pharmacy coordinates orders for barium and gastrografin. Pharmacy delivers correct dose to patient room. Have developed a questionnaire for computed tomography (CT) scans that obtains information on renal function, allergy/asthma history

Standing orders to remove and replace all medication transdermal patches for patients undergoing MRI

Weight based Heparin infusion doses are rounded to the nearest 50 units/hour.

Insulin

Insulin selections of two types to standardize usage along with greater awareness of dietary processes made demonstrable improvement in hypo-and hyperglycemic episodes

Physician leadership in the improvement of high risk medications like insulin, can lead to evidence based standardization with improved clinical outcomes

Individual insulin doses are drawn up for Lantus®, Levimir®, Novolin N®, and Novolog® 70/30 insulin. Patient specific bags are prepared with an outer label, a label on the syringe and a label for the compounding log with the patient name and dose and expiration date. Needleless dispensing required the acquisition of an insulin needle that would fit the syringe. Dead space is accommodated with an extra 2 Units of fill

Medication Administration

Policy to not administer sleeping medications after 1 a.m. has achieved strong physician compliance and has been named an Ascension system-wide best practice to prevent falls and improve daytime activity and functioning

Access to medications in the computerized medication cart is by bar code. Must scan bar code to open the medication cart, and the medication cart automatically locks. Specific Computer on Wheels (COWs) have patient specific medication drawers accessible via bar code

COWs for Respiratory Therapy (RT) medications and increased computer access for respiratory therapists led to reduction in missed doses. To reduce missed treatments to zero, cooperation between nursing and RT is needed. If RT is not able to administer a dose, nursing is alerted to administer the dose instead. RT can also electronically handoff scheduled RT orders to nursing and follow up by phone

In a manual transcription environment, pharmacy can provide a sticker (label) created for each medication for Medication Administration Record

The area around the medication room is a silent zone, and only one nurse at a time is allowed in the medication room. If the area is not enclosed, a red zone on the floor indicates the silent zone. Moved the Neonatal Intensive Care Unit (NICU) Pyxis to facilitate the silent zone

Implement a zone of silence for specifically selected tasks where interruptions may lead to errors

Medication Reconciliation

Decentralized pharmacists are involved in medication reconciliation for complex and high risk patients, including all nursing home patients

Medication Reconciliation is initiated in the ED and automatically prints in the Pharmacy. Pharmacist proactively compares the Medication Reconciliation form to the admission orders and contacts the physician for variances. Medication reconciliation process is performed at admission and in all transitions of care.

Overrides

ADC overrides (Pyxis) require a second nurse to validate withdrawal. There are a limited number of medications with permission to override: Morphine, Percocet/Lortab, and Nitroglycerin tablets

Pyxis overrides require acknowledgement by two nurses

Restrict ADC overrides to a limited number of medications that are approved by pharmacy and therapeutics for specific clinical situations

Require a second nurse confirmation for narcotic overrides

Pediatrics

Pediatric infusion concentrations were standardized, and the full process including ordering, order entry, preparation, checking, smart pump programming, and administration was standardized

Physically separate pediatric inventory from adult inventory

Remove adult forms from pediatric floor stock

Round Tylenol® doses to the nearest dosage form strength to avoid error

Standardize and automate Pediatric TPN and Standardized Infusion calculations to eliminate errors

Physician Involvement

Culture of safety uses physicians as Medication Safety Champions

Actively share ownership and responsibility for patient safety systems and processes with physicians (e.g. ownership of CPOE)

Only the Chair of a Department can approve a non-formulary drug

Successful CPOE implementation in a community hospital was led by the Vice President of Medical Affairs as champion

Prescribing (Computerized Physician Order Entry, CPOE)

Require physicians to identify indications for all medications related to a specific ICD9 code

In CPOE specific order types are locked out—Pediatrics and Chemotherapy—so that the wrong selection cannot be made

Do not permit free text of allergies into the CPOE system

For commonly prescribed vaccines with similar names, a picture of the product with indications, dose and route helps ensure that the proper drug/dose is prescribed and administered

CPOE system does not permit free-text order entry to ensure that all allergy checks and safety rules are not bypassed

In CPOE system, if a Drug Alert is skipped, it is an “unresolved alert” which is escalated to the attending

Prescribing

Forced order format with diagnosis ensures standardized prescribing and aids in dose checking for pediatric orders

Utilize the more comprehensive Institute for Safe Medication Practices (ISMP) list of unapproved abbreviations

Require the anticoagulation pre-printed order forms to be used

Require physicians to identify indications for all medications related to a specific ICD9 code

In CPOE specific order types are locked out—Pediatrics and Chemotherapy—so that the wrong selection cannot be made

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CPOE system does not permit free-text order entry to ensure that all allergy checks and safety rules are not bypassed

PCA order options are limited to choices that promote safe usage

In a paper-based order system in a community hospital, illegible orders sent to MD via email for clarification

For hospitals or departments without electronic systems the use of paper-based protocols are mandated

In CPOE system, if a Drug Alert is skipped, it is an “unresolved alert” which is escalated to the attending

Process Change

Developed safety training video showing steps leading up to a patient safety incident. Used digital camera and basic software to create training video at a very low cost; this video was the catalyst to examine all aspects of the medication use process and institute major changes with BCMA and smart pumps

Use a strategy to focus first on improving processes, then implementing new technology.

Medication Order Forms only have kilograms, they have removed pounds to avoid confusion or potential errors

Failure mode effects analysis (FMEA) can be an effective tool if results are meticulously followed up and changes implemented

Reporting

Cultural improvements including non-punitive responses have increased the willingness of staff to report “near misses”

Encourage the reporting of “near misses” assists with the identification of areas for further improvement

Medication errors are reported online; immediate investigation of errors is triggered by automatic email notification to key safety personnel

Smart Pumps

Make extensive use of a customized pediatric smart pump library

Innovative use of smart pump that ties the drug to the diagnosis for proper selection of library

To override the Smart Pump library, a multi-step process must be followed. The registered nurse (RN) must verify the physician’s order, two RNs are required at the point of care, and documentation is required. Pump overrides should be monitored and investigated to determine if the library should be updated and to avoid potentially dangerous workarounds

Smart Pump libraries are reviewed and updated on a quarterly basis to assess minimums and maximums and whether modifications to the library are needed. The pumps are updated quarterly by a manual process where every pump must be touched to update

Standardization

Standardization between health systems, if possible, has the potential to improve medication safety for a large group of patients

In a limited technology environment, pharmacy dispensing software can be programmed to trigger quality measures. A dummy medication can be created for the quality measure, which will then appear on the eMAR for nursing to address (e.g. administration of vaccines or removal of Foley catheter)

Using the principles of a High Reliability Organization, the eight steps of the medication process were examined and specification plans were devised to increase standardization

All medication rooms have a standard configuration as part of the goal of being a High Reliability Organization

Add safety messages or programming to the pharmacy item master, so that it carries through CPOE, Pharmacy IT System, and eMAR

Standard concentrations for drips

Teamwork

Empower the right team to design and implement the medication safety program with administrative support from the C-Suite

Operational decisions were pushed to the end user group: Medication Safety Champions and Super-Users

Use of TeamSTEPPS program to facilitate performance improvement and build effective teams

Use of safety coaches on each floor of the hospital

Use TeamSTEPPS to improve teamwork and SBAR for improved communication within teams.

Technology

Customize purchased Electronic Health Records (EHR) (Meditech) software to develop coordinated medication safety programs, i.e. a medication reconciliation program that coordinates with BCMA

Use a model to calculate Return On Investment (ROI) cost and benefits as defined by cost savings vs. cost avoidance. Elements included in the ROI: less paper; increased accessibility (less resource time in passing medications); fewer errors due to decision support; more efficient workflow; better/ more timely analysis; and, increased accuracy and better outcomes

Use a single drug library platform for the CPOE, drug administration and IV smart pumps

Smart pumps send infusion information back to the bedside flow record

Select ADC configuration with the physical dimensions of the item to be stored in mind. Omnicell ADC drawers were selected to accommodate syringes for the OR

Clinical pathways for medication ordering include safety alerts to nursing (monitoring parameters and side effects) and trigger pharmacist intervention for high-risk medications

The Institute for Safe Medication Practices (ISMP) ADC self-assessment tool can be used to improve ADC safety deployment

Use consistent nomenclature for medications in all technology systems (i.e. brand, generic, strength, concentration, Tall Man, and warnings) improves standardization across all platforms

Technology Implementation

Have extra staff available for the roll-out period

PHARMACEUTICAL SAFETY LEADING PRACTICE PROJECT

Lessons Learned Tip Sheet

During the winter of 2010, 41 site visits were conducted by staff of the New York State Health Department's Patient Safety Center to verify the data collected in a survey to pharmacy directors and also to identify and catalogue pharmaceutical safety leading practices. Through extensive conversations with hospital personnel from numerous departments, researchers also collected an assortment of useful tips – a legacy of real-world experience. These 'pearls of wisdom', or Lessons Learned, appear in the eight broad categories listed below. We hope they help ameliorate barriers you may encounter while implementing new medication safety processes and technology.

Community

Encouraging the use of medication list wallet cards can facilitate medication reconciliation

Plan sufficient lead time for a community outreach program (e.g. drug drive to safely dispose of expired and unused medications) to get the necessary approvals

Culture of Safety

Making an investment in technology requires the effort to implement correct processes. Use all of the safety modes within the technology and monitor use to ensure continued appropriate use of the technology— all reinforced with a culture of safety

Senior leadership plays a key role in daily reinforcement of safe practices

With ongoing emphasis from senior leadership, a great deal of positive progress can be made in a short period of time

Meetings where patient care is discussed can assist with the identification and reporting of near misses and errors, in addition to expediting care

Success in building a culture of patient safety is grounded in pharmacy leadership, and consistent and trusted interfaces with nursing and administration

The training program for the core group of leadership was voluminous and there was a lag in being able to internalize and implement the cultural changes, i.e. understand the behaviors that impact safety

Recognizing staff for outstanding efforts with unique awards or praise is an important part of building a safe culture

Senior leadership can create the culture where clinical leadership institutes standardization that is essential to safety and improved outcomes

Cultural changes take time—with continuous reinforcement by senior leadership, a more open and a "Just Culture" can transform how patients are given care

In a low-tech environment (no computerized physician order entry - CPOE or Bar-code medication administration - BCMA), an open culture becomes very important by encouraging reporting and tracking of occurrences to facilitate standardization and process changes

General

Heparin administration improvement project required six months of intensive study in order to hard-wire the process and make it less error prone. Persistence pays off

Clear instructions are a valuable tool in an emergency.

Emergency drug kits that include detailed instructions – listing all steps in the process, with no need to look up information – reduces the chance of error by enforcing protocol standardization

Stage projects to avoid simultaneous implementation

Anticipate vendor delays

Develop a list of questions to ask the vendor

Require onsite support from vendor

Do challenge your vendor

Unanticipated demand for more power outlets. Recommend planning for additional power outlets

Do not accept “working as designed” if it does not support the way clinicians think

Nursing

Requiring a second nurse to validate overrides institutes an additional safety check in the medication administration process

Coordinate with nursing during the development of emergency drug kits to simplify the use and increase the accessibility

The busy nature of the average nursing unit can contribute to medication errors. As part of a blameless culture, medication errors can happen to anyone. A system re-design to effectively address the human-system interface can help prevent future errors

Pharmacy Department

When multiple remedies for sound alike medications still result in errors, eliminate the product selection entirely by removing from the formulary

Address clinical issues with drug timing by making the drug more accessible using existing technology

Pharmacy/Nursing/Physician communication has improved as a direct result of the BCMA process

Medications are scanned on receipt to verify scan-ability

Automatic therapeutic substitution and generic substitution can impact medication reconciliation accuracy. Clinical pharmacists were deployed to address the integrity of the medication reconciliation process

As an outcome of a Magnesium Sulfate investigation, all drip concentrations were evaluated. Current infusion pumps cannot accommodate the standard infusion library, so new pumps are being researched

Hospitals can use strategic deployment of their clinical pharmacists to affect the process changes for medication safety

Strategic and judicious deployment of forcing functions in CPOE such as specific drug “sentences” can lead to improved standardization. By forcing the choice of pre-programmed drug, dose, frequency groups ensures appropriate prescribing. Options that include choice of the individual drug, dose and frequency can lead to prescribing errors

Instituting a bar code medication verification of refilling ADCs can be defeated if the loop is not closed by permitting nursing return of drug to the ADC. Returning all medications to pharmacy ensures that the drug will be refilled in the correct location

Physicians

Bring actionable information that is vital to physician performance improvement committees to affect change. Allow physicians to discuss the performance improvement information and have input on the resolution for improved buy-in. Structure physician target improvement areas for quick wins to convince physicians and get them involved

Engage physicians early; set expectations; give them responsibility for implementation; and guide progress with outcomes data

Physician involvement in the community hospital is vital. Be willing to take the extra effort to get them involved. Be willing to meet with them on their turf (in their offices)

Engaging house staff in a monthly Quality and Patient Safety Meeting allows them to learn from their peers, reinforces safety, and makes the experience more meaningful

Physicians must own the safety process

It is recommended to have a point person for physicians to raise their concerns, e.g. how to search the electronic medical record for the needed clinical information

Physicians may be unaware of the positive achievements of the medication safety program. It is recommended to develop a regular communication vehicle to share medication safety issues with physicians

When a physician (e.g. Hospitalists) is unfamiliar with the patient, medication reconciliation becomes more important

Involve physicians in the design and implementation team as the physician champion

Improve physician buy-in with an evidenced-based communication strategy deploying physician champions

Quality Improvement

A careful studied review of the population served via FMEA will highlight vulnerabilities, which can be addressed with process improvements

A Board of Directors representative as part of the Performance Improvement Oversight Committee allows for a “heavy” hitter to nudge the medical staff

Lean Six Sigma provided better tools for analysis of medication errors. Using the Define, Measure, Analyze, Improve, Control (DMAIC) cycle helped to measure the impact of process changes

Specific safety steps must be mandated with 100% compliance each and every time (medication time-out) to drive out errors

Do not allow a toxic dosage of any medication in the sterile field. The maximum dose permitted is the maximum based on the patient’s weight

Improve communication of errors and near misses that have the potential to impact patient care

Case vignettes are an effective teaching tool to increase awareness of error prevention

Do use your system to enhance medication safety by building strong clinical decision support

Technology

BCMA system took two years to implement

BCMA when accompanied by clinician involvement, dedicated resources (e.g. medication cabinets and COWs) and defined processes to administer dose in various situations, can eliminate transcription errors, reduce missed medications and lessen the impact of medication errors

Having extra support during the roll out of BCMA facilitates successful implementation

A four hour BCMA pre-launch training program was required of all nurses. Training before passing medications made sure that the nurse was competent in understanding the changes in the workflow process

To facilitate BCMA in isolation rooms, COW keyboards were covered with a water-proofed seal to facilitate cleaning

BCMA does not save time

BCMA laid the ground work and made the implementation of smart pumps easier

Wrist band patient ID needed upgrade to interface with BCMA system

Battery life of the COWs, ability to lock medication drawers, durability of the COW wheels and ergonomics of the COW configuration all must be considered in the BCMA design

Pyxis overrides can lead to inappropriate administration of medications, as the safety checks are skipped

Free text entry in a CPOE system can be a dangerous work-around

Limiting the number of override opportunities ensures that the proper safety checks are not circumvented

Anticipate technology workarounds during the implementation or when an issue arises and change the system to prevent them from occurring

Listing the appropriate use of the medication (diagnosis) next to the dosage in the smart library has led to reduced errors

In a limited technology environment, creative “outside the box” thinking has allowed for adaptation of existing technology in novel applications to facilitate standardization of care and increased quality measures

In a low-tech environment, for prescriptions where calculations are required, structuring the order form so that all work is shown, facilitates double checking and validation of the order

In a limited technology environment, low tech dispensing solutions are available, e.g. overwraps that call attention to SALAD drugs

Do not let hardware be a barrier to implementing the strategy as outlined by executives and Steering Committee

IT analysts from each clinical department work half-time on the floor to maintain clinical credibility. Those clinical resources assist with design and serve as advocates among peers and super-users during the implementation phase

Very organized systematic approach that aligns with long-term IT strategy and assesses how all relevant IT systems will impact patient care is critical to a patient-centric approach; collaboration among many disciplines was a key factor in the successful pilot

“Implementation of IT in health care is more of a journey than a destination, as is as much about the process as it is about any technology used”

Use the same platform for all pharmacy systems and create testing scenario that validate the data integrity

Have a strong management information system (MIS) department that helps to prioritize medication issues (don't get lost in a queue somewhere)

Making it easier for clinicians to immediately view all relevant information in CPOE decision support, pharmacy dispensing verification, and on the electronic medication administration records (eMAR) helps prevent medication errors

Do not rely on your electronic system to fix broken processes

Anticipate staff workflow changes and take proactive steps to address them

Collaborate with end users in selection and application of new technology

Do build your system to support stable processes

Preprogramming calculations of TPN has driven out the possibility of human error in calculations

Given the rapid deployment of technology, it is important to create mechanisms to measure the effectiveness of technology implementations

Lack of resources can be a barrier to implementation of an eMAR. Outsourcing provides a good alternative to achieve goals

APPENDIX C

Leading Practices Maturity Level

Element		Level I Practice	Level II Practice	Level III Practice
Culture of Safety	Senior Leadership	Senior Leadership becomes engaged in patient safety to set goals, align efforts, provide resources, remove obstacles and require adherence to patient safety practices	Senior Leadership takes responsibility for implementing, monitoring and revising strategy to achieve patient safety objectives	Senior Leadership creates alignment of Performance Improvement plans, Strategic plans and Financial plans to facilitate patient safety
		C-Suite engages (sets the stage for active participation) the executives who report to them, clinical leadership and the Board of Directors in patient safety	Board of Directors, Physicians, and Staff are engaged in safety efforts by receiving regular reports from Quality and Patient Safety	Senior Leadership demonstrates a daily commitment to patient safety with tactics such as a daily safety briefing with the Patient Safety Officer
		A Patient Safety Officer coordinates hospital-wide safety improvement activities	Leadership conducts patient safety walking rounds	Patient safety walking rounds occur weekly, include medications and take the form of tracers
		Medication safety issues get reported to the Chief Executive Officer (CEO), Executive Committee of the Medical Staff, and the Board of Directors	Each Clinical Department and Service Line has a PI plan that leads up to the overall PI plan	The Board of Directors is actively engaged in discussions of medication safety and error prevention through regular reports from the Patient Safety Officer/Senior Leadership
		Senior Leadership has a strategy on how to communicate and discuss medication safety issues	Feedback reaches all staff including alternate shifts, weekend and casual employees	Established policy for the Attending Physician to share errors with the patient and family
			The non-punitive management philosophy is reinforced by asking staff members who have reported safety issues, near misses, or adverse events to share their story with others, including how the management supported them	Patients are engaged in safety efforts i.e. included in rounds or in monitoring for compliance with safety practices, or participation in patient safety committees
			Staff, patients and families are supported when an error occurs	

Element		Level I Practice	Level II Practice	Level III Practice
Culture of Safety <i>continued</i>	Physician Leadership	Physicians take ownership of medication safety efforts. Performance improvement (PI) in service lines includes medication safety	Physicians act as Medication Safety Champions in the roll out of specific safety initiatives	Physician evaluation and compensation is dependent on compliance and engagement in patient safety
		The pharmacy and therapeutics (P&T) committee uses a standardized approach to medication selection including Sound Alike Look Alike, Failure Modes and Effects Analysis	A senior physician is designated on every floor to encourage a code of mutual respect and blame-free culture	A hospital-selected liaison to physicians travels to their offices to provide patient safety training to voluntary physician staff and their office managers
			Physician champions are identified, engaged and support safety efforts in the execution of a medication safety program	In teaching hospitals, medical residents are engaged in patient safety and receive regular feedback about safety issues such as prescribing in formal and informal meetings
				Use of Just Culture ARCC technique: Ask a question, Raise an awareness, voice a Concern, go up the Chain of Command
	Culture of Safety Survey	Have administered the Agency for Health Care Research and Quality (AHRQ) Survey of Patient Safety (or other culture of safety) survey and have created a safety plan based on the results of the culture survey	Senior Leadership reinforces to frontline management non-punitive actions in the handling of incidents and reporting of near misses	Just Culture of Safety Policy defines human error vs. reckless behavior and specifies the response to each

Element		Level I Practice	Level II Practice	Level III Practice
Culture of Safety <i>continued</i>	Reporting and Investigation	The hospital uses National Coordinating Council Medication Error Reporting and Prevention (NCCMERP) definitions for medication events. Events are tracked and monitored by category	Reporting of near misses is encouraged (NCC MERP categories A, B, C)	Multiple channels exist for reporting medication errors (voluntary reports, data screening, dose monitoring, audits, data mining and analysis)
		A non-punitive environment (by policy and demonstrated in actions) exists for reporting of errors	Anonymous reporting available to all staff	Regular communication from leadership includes medication occurrences, and situations where occurrences have happened. Staff are encouraged to speak up and when errors happen “stop the line”
		All serious errors are submitted to NYPORTS or to other external bodies (The Joint Commission)	Quality and safety metrics are tracked on a regular basis and are reported up through the institution to the executive leadership and the Board	Investigation and feedback of occurrences is timely. Reports are used to improve systems and educate providers
		The occurrence reporting policy is communicated to the staff routinely	Employees are rewarded for open sharing of occurrences and involvement in safety initiatives in their annual performance reviews	Regular and open feedback occurs about safety from all levels of leadership, from front-line management to Senior Leadership
		In a paper-based system, the paper incident report is designed to facilitate investigation with a series of check boxes that help identify root causes, contribution of processes and conditions on the unit at the time of the occurrence	Online Incident Report Form triggers immediate notification via email to unit managers, pharmacy, risk management (multi-disciplinary) for investigation and follow-up of errors and near misses	Analysis of online reports is used to provide insight into trends that require system or process changes
		A formal method is employed for patient safety performance improvement (e.g. PDCA). Medication errors are systematically investigated	Failure Modes and Effects Analysis is used to detect potential points of failure in the medication delivery system	FMEA analysis of processes where near misses are identified is routinely performed
		Occurrences are analyzed and investigated to uncover the cause	Occurrence and near miss reporting are tracked and investigated to uncover the cause	Modifications in Processes have been made as a result of Near Miss Tracking
		Route Cause Analysis (RCA) is used to investigate serious errors and to identify contributing factors to occurrences	Managers are trained to identify human factors and system failures in errors and adverse events	FMEA analysis is performed proactively on high risk, error prone processes and changes made to prevent error

Element		Level I Practice	Level II Practice	Level III Practice
Culture of Safety <i>continued</i>	Medication Safety Plan	A Medication Safety Plan is used to guide improvement activities	The Medication Safety Plan is monitored and outcomes are tracked	Medication Safety Plan is trended over time with specific data on how well a solution is working (documented improvement over time)
		Responsibility for the Medication Safety Plan is delegated to a specified person/role who reports to the Quality committee of the hospital		Medication Safety Plan is reviewed and revised annually based on continuous monitoring of process improvement activities
	Communications	A safety newsletter is used to communicate safety information	The language of patient safety including safety terms is used in every day care and extends to the level of front line care givers	SBAR (Situation-Background-Assessment-Recommendation) is used for communication
			At the start of each shift, staff is made aware of safety issues by the unit manager who relays information such as patients with the same last name, trials of equipment, patients involved in research protocols	Timely direct feedback is provided to those who submit reports
			Safety items are on the agenda of every meeting	A practice of stopping and re-verifying a medication, test, or intervention is in place when a patient/family asks whether it is correct
			Safety briefings are in place to collect detailed information about safety issues raised by staff	Respiratory therapy, physical therapy, pharmacists or others who routinely work on a unit are included in safety briefings

Element		Level I Practice	Level II Practice	Level III Practice
Culture of Safety <i>continued</i>	Process Changes		A multi-disciplinary Medication Safety Team exists to track and trend interventions	Medication Safety Team includes front line staff and is tasked with anticipating errors and redesigning systems
		Process changes have been made in response to errors	Process changes have been made due to near misses	There is continuous monitoring, feedback and revision of all aspects of medication processes
			Specific process changes are made as a result of RCA findings	Processes that contributed to actual errors or have the potential for errors have been identified and changes made to prevent errors
		Periodic and ongoing education is provided to all clinicians involved with the medication use process	Teamwork is emphasized in transitions of care	TeamSTEPPS methodology is used in teamwork communication
			Re-enactments of events or near-misses are used to raise staff awareness and teach safety lessons	Simulations are included in training for error-prone, high-risk or unusual situations
			A decision tree for unsafe acts is in place to determine how human factors and systems issues contributed to the event	Human factor engineering approaches and analyses are used to standardize, simplify and automate processes to reduce the potential for human error
			Tendencies for human error have been examined and standardized systems have been designed to prevent human error	Front-line patient care roles, responsibilities and protocols are clearly defined and systematized and are not dependent on the individual serving in the role

Element		Level I Practice	Level II Practice	Level III Practice
Core Processes Technology	Technology General Considerations	The formulary includes selection of the most common medication strengths that are on CPOE screens, on pre-printed orders and stocked in ADCs. Special procedures are developed to prevent mix-ups with less commonly used strengths	Reports are created (in non E.HR environment) or links generated for sharing of important information between clinical disciplines such as culture and sensitivity reports are linked to antibiotic administration information	EHR is fully integrated between all ancillary departments and clinical documentation that allows for sharing medication information, allergy information and other pertinent medication information across the continuum
		Processes improvement occurs before or with technology implementation (automate the right processes)	Medication safety performance improvement includes planning and prioritization of new technology implementation	Hospital participates in a Health Information Exchange, either posting or retrieving medication information
		Drug interaction checks are performed in CPOE and the Pharmacy Dispensing software. Pharmacists have the responsibility to review all drug interactions that clinicians may have missed	System alerts have been reviewed and prioritized to avoid alert fatigue, less critical alerts have been removed	The hospital formulary is available in a format that is downloadable to a PDA
		A single drug library platform is in use in all systems including CPOE, the pharmacy dispensing system, drug administration system, and IV smart pumps	System alert overrides and workarounds such as serious drug interactions, smart pump limits are monitored on a monthly basis. Override information is used to make adjustments	Drug reference information is online and accessible via all platforms
		Patient allergy information is available in multiple locations such as the medical record, the wrist band, and extends across all technology platforms so that all platforms are updated simultaneously		In a limited technology environment, the pharmacy computer system is manipulated to create reminders for care activities such as core measure compliance
B. Core Processes Prescribing	Credentialing			Medication safety is included in the credentialing process. Data on prescribing feedback and participation in safety efforts is included
		Clear policy and process to grant mid-level practitioners clear prescriptive authority	Non-physician (mid-level practitioners) prescribing authority is tracked and monitored for compliance with prescriptive permissions	

Element		Level I Practice	Level II Practice	Level III Practice
B. Core Processes Prescribing <i>continued</i>	CPOE	CPOE with Clinical Decision Support Systems (CDSS) is fully implemented with mandatory participation	Non-standard or rarely used medications are removed from the CPOE pop-up screen	CPOE undergoes daily surveillance to identify opportunities for improved patient safety. Issues are resolved within 24 hours
		All relevant laboratory results are displayed in CPOE when medications are ordered. The most recent renal function information displays at the time of prescribing with recommended dose modifications	CPOE is structured in drug sentences with drug, dose, frequency bundled into a selection choice	CPOE with continuous monitoring of practices (data mining) is used to provide feedback and is the basis of CPOE modifications. System changes are hard coded so that errors don't happen again
		Free text entries are not permitted for allergies and medications. The use of the standard drug library is required	To address questions in a timely fashion, a HIPPA compliant secure communication system allows physicians to receive an electronic copy of the order via email	CPOE analysts have training in epidemiology and use data mining to support change
		Third party content like Zynx is used to create clinical rules	CPOE is supported with clinical rules for High Risk Medications that deploy evidenced based protocols. CPOE prescribing for High Risk Medications has vigilant monitoring for error prevention	CPOE requires the entry of the reason for an allergy override to enhance communication between disciplines
		Physician leaders and medical staff drive the process to approve and adopt the clinical guidelines and order sets for use in the CPOE clinical decision support system	A representative from IS is included in clinical committees to validate feasibility of concepts. New concepts are vetted with informatics	CPOE requires physicians to identify the indications for all medications related to a specific ICD-9 diagnosis code
		CPOE has alerts for SALA drugs during the ordering process	CPOE includes prompts for corollary orders (blood glucose checks when insulin is prescribed) ⁴	CPOE includes a high-risk medication checklist to force the consideration of the risks vs. benefits before prescribing (Anticoagulants)
		Patient demographics such as age, weight, renal function, laboratory results and current medications are accessible at the time of prescribing and display in a user-friendly manner (link)	An availability policy limits medication ordering to specific locations. A Security policy limits ordering to specific physicians with the appropriate credentials	CPOE has alerts for drug/symptom combinations in an integrated electronic health record
			Track, record and share evidence that demonstrates improvements in high-risk medication safety through the use of CPOE, to increase compliance and overcome medical staff skepticism	CPOE clinical decision support systems include evidence on the comparative effectiveness of medications for specific patient populations

Element		Level I Practice	Level II Practice	Level III Practice
B. Core Processes Prescribing <i>continued</i>	Guidelines	A policy exists that defines acceptable verbal order conditions	Pre defined conditions for protocols or guidelines are initiated and managed by nurses, pharmacists or other personnel are pre-defined (specific emergency situations)	Decision support (rule development) using evidenced-based practices is used in ordering processes
		Unapproved abbreviations are defined and limited. Pharmacy enforces a “no dispense” policy for orders with unapproved abbreviations	Mandated guidelines or pre-printed orders are evidenced based and standardized for therapy (not by individual physician practices) for 75% of medications	Forcing functions are deployed to ensure compliance with a performance standard
	Weight Based Dosing		Weight based dosing is mandated for all standard drips. Patient is weighed at the start of therapy	The use of weighing function in beds is used or the use of a consistent method of weighing, including equipment for accurate weights is used daily
	Medical Residents	Medical Residents are given an orientation to prescribing and receive specific training on preventing medication errors	Medical residents receive regular feedback on prescribing issues	Chief Medical Resident provides regular feedback on prescribing to the medical residents, which is used to modify CPOE to prevent errors
			Documentation of the indications for the use of an emergency drug is required to provide prescribing feedback to residents in training	Medical Residents have a Resident Patient Safety Officer to be the primary contact for resident safety efforts, which is a stipend position
			An unresolved CPOE alert is escalated to the attending physician	Medical residents have a Quality Council that meets monthly to discuss and resolve resident- identified issues from the front line
			Chief Medical Resident monitors high risk drugs daily (anticoagulants) and provides daily feedback to medical residents	Medical residents have an active role in the hospital PI process and in hospital quality committees
				Medical residents participate in the NY State “Near Miss” reporting program

Element		Level I Practice	Level II Practice	Level III Practice
Core Processes Transmission/ Transcription	Transmission	Order images are scanned with pharmacy manual order entry and verification (without CPOE)	An electronic image of the physicians order populates the pharmacy order entry system	All medication orders are administered with pharmacist verification, even in procedural areas
	Transcription	In a paper-based system, pre-printed forms for common orders, medication flow sheets, and MARs are mandated		
B. Core Processes Pharmacy Dispensing	Dispensing	Pharmacy system forces entry of height, weight and allergy information	Laboratory system notifies pharmacy of selected laboratory results. Pharmacy system forces acknowledgement of specific lab information (forcing function- renal dosing, abnormal INR)	Forcing functions are deployed to ensure compliance with a performance standard (core measure)
		Unit dose distribution systems are in use. Medications are labeled in ready-to-use single doses with generic and brand name	Patient specific medications are removed from the unit, on a timely basis after discontinuation. Unit-based pharmacy techs or pharmacists perform this duty	Pediatric TPN calculations are standardized (pre-programmed) and end-product concentration is validated prior to dispensing
		Pharmacy admixes IV solutions	All IV solutions have standard concentrations	IV compounding uses a robotic system that calculates, prepares and dispenses standard IV preparation. The robot has a photographic bar- coded QA audit trail of compounded medications
		High risk auxiliary alert labels are required to be removed before accessing the drug product to ensure that they are noticed	Special processes are developed for high-risk medications including written guidelines, checklists, pre-printed orders, double- and/or triple checks by multiple clinician types, special packaging and labeling, and education	The risk associated with IV admixture products has been examined for mitigation strategies. Processes are in place to reduce IV admixture risk
		Prepare all non-standard doses in the pharmacy, package and label individually	Medications are purchased to avoid look-alike products	There is a limited number of color coding selected for very specific purposes
		Pharmacist is available 24/7, (on call after pharmacy is closed)	Pharmacy services are 24/7 (never closed) either in-house or remotely with a contracted service	Pharmacist reviews all medication orders including those in procedural areas, ED, OR. There are defined situations when a medication can be given without a pharmacist review (emergencies)

Element		Level I Practice	Level II Practice	Level III Practice
B. Core Processes Pharmacy Dispensing <i>continued</i>	Dispensing <i>continued</i>	Special labeling is added to error-prone medications		Deployment of CPOE allows for expansion of pharmacist services onto the clinical units and into areas previously not covered by pharmacist review of medications
		Hazardous medication units, doses and concentration are removed from patient care floors (e.g. all concentrated potassium chloride (KCL) units from nursing units and patient care areas		Pharmacy system has alerts for drug/symptom combinations in an integrated electronic health record
		Either ADC's in a profiled cartless mode or Robotics provide the 24 hour medication supply		
	ADC	TALLman lettering is used in all technology platforms for high risk, look-alike, sound-alike medications	Two nurses are required to witness overrides of narcotics and emergency medications. Overrides are limited to Morphine, Percocet/Lortab and Nitroglycerin	Replenishment of medications (in ADC's, Carousels) uses Bar Code technology
		Configuration of the ADC uses the physical dimensions of the item to be stored to optimize storage	Drug reference information is accessible from the ADC screen	The ISMP self-assessment has been conducted and remedies have been instituted to address "less than fully implemented"
		In a cartless system >85% of medications are available in the cabinet	When a cartless system is in use, medications are optimized and adjusted for current use patterns on a quarterly basis	ADCs have CDSS that ask specific questions on medication usage to screen for ADEs and drug class interactions
		ADCs are deployed for floor stock and prns. Overrides are tracked	Overrides are permissible for a limited number of medications for specific P&T approved conditions	ADC safety is a Medication Safety Committee standing agenda item

Element		Level I Practice	Level II Practice	Level III Practice
B. Core Processes Pharmacy Dispensing <i>continued</i>	Clinical Pharmacists	Clinical (decentralized) pharmacists are available on the nursing units and have specific clinical duties that include medication error investigation	Clinical pharmacists can select doses for certain high-risk medications based on physician approved protocols (collaborative protocols)	Clinical pharmacists provide services to high-risk error prone areas (ICU, OR, ED) including review and validation of all medication orders
		Clinical pharmacists perform and document interventions in the clarification and verification of physician orders	Clinical pharmacists are included in unit-based activities such as safety briefings, rounds and simulations	Clinical pharmacists participate in antimicrobial stewardship and provides alerts when a revision in antimicrobial therapy is needed or the presence of an infection marker without treatment
		Clinical pharmacists are included in patient counseling of selected complex or high risk medication regimen	In a low technology environment, decentralized pharmacists are placed on the unit and can process orders, dispense first doses and provide face-to-face clinical services	Clinical pharmacists have a work queue that organizes tasks such as medication reconciliation, target drug monitoring, core clinical activities, and high risk drug monitoring
		Clinical pharmacists can automatically adjust dosages for renal impairment and or advance IV medications to oral when clinically appropriate, per P&T approved protocols	Pharmacy management tracks pharmacist activities to balance priorities and provide consistent care to all patients	A Medication Safety Officer is in place and coordinates medication safety activities in conjunction with the Patient Safety Officer

Element		Level I Practice	Level II Practice	Level III Practice
B. Core Processes Medication Administration	General Medication Administration	Pre-printed infusion guides (drip charts) are provided for all weight based dosing that has precalculated the infusion rate in ml/hr to eliminate calculation errors	For weight based protocols, the patient is weighed at the start of therapy with identified requirements for documentation	The use of weighing function in beds is used or the use of a consistent method of weighing, including equipment for accurate weights is used daily
		Drug information is available in each location that medications are administered	A handoff of treatments that may be delayed from respiratory therapy to nursing exists to reduce missed respiratory treatments	Double check procedures are instituted for high risk drugs requiring two nurses to co-sign for administration
		It is established policy to call pharmacy anytime they are uncomfortable with a dosage or a medication administration	All patient care unit medication rooms have a standard configuration	Forcing functions are deployed to ensure compliance with a performance standard (core measure)
		Nursing is instructed to count the zeros with heparin to ensure that the proper product is selected and administered		Patient education is provided with the administration of every medication and includes relevant drug-food interactions. Printed medication information is provided in the primary language
				In-house expert consultants are available to guide interventions during adverse drug events
			Specific tasks that should not be interrupted are defined as “silent zone” tasks such as the area around the ADC, while medications are being prepared	

Element	Level I Practice	Level II Practice	Level III Practice
B. Core Processes Medication Administration <i>continued</i>	Smart Pumps Nurses are mandated to use all safety functions of Smart pumps including libraries. Overrides are not tracked	Nurses are mandated to use all safety functions of Smart Pumps including libraries. Overrides are tracked. Performance improvement efforts exist to reduce the overrides	Smart pumps overrides are tracked. Minimum and maximum infusion rates are reviewed. Additions, deletions or modifications are identified. Changes are made to the library at least quarterly (wirelessly) or annually (manual updates)
		Smart Pump attributes include wireless connection to a pump brain; libraries that minimize user choice, standard concentration and volume options, single channel for high risk medications, visually indicate when a dose is outside pre-set limits, and have non-numeric keypads. Screens visible from a distance of four feet	Smart pumps are able to push information back to the bedside flow record with rate, dose and duration of an infusion
			Pump overrides follow a standard multistep process: RN verifies physician order, two RNs are required at the point of care, specific documentation is required, notification of the Unit Manager required who notifies pharmacy
			Pediatric smart pump library links the drug and dosage to a diagnosis for proper selection within the library In a manual pump update, usage information is collected from each pump

Element		Level I Practice	Level II Practice	Level III Practice	
B. Core Processes Medication Administration <i>continued</i>	Anesthesia and OR	Time outs occur at the beginning of surgery. The duration of the time out is lengthy enough to accommodate a review of the preference card, confirmation of the medication directions, confirmation of patient allergies, and confirmation of pre-procedural antibiotics	Profiled Automated Dispensing Cabinetry for OR are in use	Medication time outs occur each time a medication is introduced into the sterile field	
		Neuromuscular blocker inventory is segregated and storage areas clearly labeled			Introduction of a toxic dosage into the sterile field is forbidden. Maximum doses permitted is based on patient weight
		Anesthesia cart trays are standardized and monitored for usage patterns			
		Advanced preparation of syringes is minimized. Syringes are segregated from the immediate workspace in the OR			
		The administration of preoperative and intraoperative re-dosing of antibiotics is standardized by medication, time and responsible person			
		All anesthesia medications are labeled as they are drawn up			

Element		Level I Practice	Level II Practice	Level III Practice
B. Core Processes Medication Administration <i>continued</i>	MAR	Implement a communication system to ensure timely administration of new STAT orders suitable for the systems in place i.e. in an electronic system, a communication via “hard” alert for STAT orders is in the overview display on a prominently located monitor	An eMAR has alerts for SALA drugs	The eMAR is linked to the laboratory system and alert for abnormal lab values prior to medication administration
		Standard medication administration times are established with predefined schedules that include medication start procedures	An eMAR has safety alerts for allergies, drug interactions, or therapeutic duplicates	The eMAR is linked to assessment scales such as a pain scale to facilitate appropriate documentation. Reassessment of patient response is a free text entry to close the loop
		A paper-based MAR is printed from an electronic system and uses a printed label for new and changed medication orders	An eMAR has administration alerts for timing, safety, and medication discontinuation	

Element		Level I Practice	Level II Practice	Level III Practice
B. Core Processes Medication Administration Administration <i>continued</i>	Bar Coding Medication Administration (BCMA)	All BCMA is by definition a Level II practice	BCMA development uses a readiness for technology assessment process	BCMA uses Computers On Wheels (COWs) with individual patient medication drawers
			Adequate number of workstations on wheels and scanners are available for each nurse/respiratory therapist passing medications	Medications from COWs are only accessible by barcode scanning of the correct patient drawer associated with the patient wristband
			BCMA mandated for all personnel who pass medication.	Nursing uses a list of all undocumented medications as a handoff during shift transitions
			A standing interdisciplinary committee is tasked with BCMA development that continues to meet after go-live to conduct proactive continuous performance improvement activities	BCMA alerts are tracked and evaluated for process changes
			For BCMA, pharmacy scans all medications for scanability	BCMA has daily feedback on medications that are unable to be scanned (barcode problems)
			BCMA implementation is piloted with a controlled unit such as respiratory therapy	Interoperability extends to incorporate bar-code technology on each IV medication bag which can automatically program the smart pump according to the bar-code of the current medication order
			BCMA rollout is sequential with simultaneous go-live for units that serve the same population. (CCU and Step down units)	IV Interoperability uses the BCMA system to provide monthly compliance reports for each nurse distinguishing technology errors from users bypassing the technology
			Additional staff and super-users are available during the go-live	To facilitate BCMA a formal liaison role exists as a go-between with pharmacy and nursing, e.g. a nurse who reports to the director of pharmacy
			BCMA has electronic access to drug information	Medication labels have two patient identifiers

Element		Level I Practice	Level II Practice	Level III Practice
B. Core Processes Medication Administration <i>continued</i>	Bar Coding Medication Administration (BCMA)		Pharmacy dispensing system has a “hold acknowledgement” function that communicates that an investigation into a questionable order is in process	Medications that are incapable of scanning, like ointments, have a defined process for recording administration such as a double check by two nurses
			All pharmacists are trained on all aspects of BCMA implementation and clinical (bedside) use	Decentralized pharmacists assist with BCMA troubleshooting
Medication Reconciliation	Medication Reconciliation	Medication reconciliation occurs at admission and discharge	Medication reconciliation exists on admission and with each transfer of care (change in condition, change of provider, and change of address) as well as at discharge	Medication reconciliation information is posted to a health information exchange
		The medication reconciliation system has visibility into previous admissions	Based on insight from the AHRQ SOPS, improvement efforts include integrating medication reconciliation in the transitions in care improvement process (not carved out, part of the overall improvement process)	Medication reconciliation information is part of an integrated electronic health record that includes outpatient and inpatient visits
		Patient history includes patient’s own pharmacy with contact information	Medication reconciliation is automated at the transfer of service	CPOE automates Medication Reconciliation and Medication Renewal
			The medication reconciliation system includes visibility into the MAR to assist with renewal decisions	Pharmacist investigations into reconciliation variances are documented in the medical record
			Medication reconciliation is integrated into the pharmacy order verification process and addresses auto-substitutions, generic/brand name issues, and therapeutic duplications	Medication reconciliation in the outpatient setting is required at the time of service

Element		Level I Practice	Level II Practice	Level III Practice
Medication Reconciliation <i>continued</i>	Community Outreach	EMS coordinates retrieval of medications from the home to assist with the home medication list		A community drug drive is held to safely dispose of expired and unused medications from the community
				When complex or unusual medications are prescribed, the outpatient local pharmacy is contacted to ensure that the right medication, right concentration is dispensed to ensure continuity of care
	General High Risk	Pre-planning for infrequently used high risk drugs includes a kit that contains the drug, diluents, mixing instructions, approved indications, drug administration instructions, monitoring parameters	Proactive review of literature or ISMP alerts is used to guide medication error efforts	High Risk Medications are targeted, studied, analyzed and protocol changes are made in response to findings
		Two pharmacists are required to check Potassium Chloride doses greater than 20 mEq	Pharmacy screens radiological orders for renal dose adjustment and allergies	High risk medications ordered STAT have pharmacist review prior to administration

Element		Level I Practice	Level II Practice	Level III Practice
Medication Reconciliation <i>continued</i>	Pediatrics	All pediatric medication dosage amounts are double checked by nurse, pharmacist and/or clinician 59	CPOE screens only have pediatric or neonatal medications available for selection	Electronic medical record links to standard on-line pediatric references
		All dosage forms have standard concentrations	Acetaminophen doses are based on a mg/kg dose that is rounded to the nearest appropriate full dose dosage form	Standardized ordering format that includes the diagnosis, and drug information that facilitates dose verification process by matching drug dose frequency to diagnosis
		Pharmacy dispenses patient specific doses based on actual weight	Neonatal TPN final product validation is sampled prior to dispensing	TPN ordering process standardizes calculations to eliminate error
		Guidelines for the specific use of pediatric sedation and anesthesia are mandated	Every pediatric dose is labeled "pediatric" on the label and on the MAR	When complex or unusual medications are prescribed, the outpatient local pharmacy is contacted to ensure that the right medication, right concentration is dispensed to ensure continuity of care
		There is a physical separation of pediatric and adult drug inventory in all storage areas	A double check process with two nurses is required on pediatric vaccine administration	
		A standardized neo-natal and pediatric IV and Oral formulary exists. Standardization and dose limits of high risk medications exists		
		Include the mg/kg dose on all pediatric drug orders to allow pharmacists and other clinicians to perform critical double-checks because of the specialized calculations of pediatric medications	Pediatric infusion concentrations are standardized by weight in ranges of 0-5 kg, 6-20 kg, 21-50 kg which carries through from the ordering, dispensing and administration of the drug	
		All Pediatric doses dispensed are double checked by a second pharmacist perform critical double-checks because of the specialized calculations of pediatric medications	Adult strength medications are not available on Pediatric nursing care areas	

APPENDIX D**Bronx-Lebanon Special Care Center**

Title of Poster: **Promoting Medication Safety Systems Initiative Utilizing Physician Order Entry**

Project Staff: Peter Kennedy, LNA, Geoffrey Lord, Pharm.D

Project Leader(s): Robert Walsh, MD, Peter Kennedy, LNA, Geoffrey Lord, Pharm.D, Lawrence Schiller RPh, MS, Kyoung-Sil Kang, Pharm.D

PROJECT OVERVIEW

This project is to advance safe prescribing practices for vulnerable populations namely, the elderly and HIV-positive adults using health information technology and health information exchange in long-term care facilities. The Bronx-Lebanon Special Care Center (BLSCC) will implement a Computerized Physician Order Entry (CPOE) system with clinical decision support and customized prescribing tools. The system will provide a computer generated E-MAR for nursing. This will advance us closer to a paperless system (no paper faxing or missing documents). Also, patient information will be shared within our health care network.

GOAL AND OBJECTIVE

With CPOE decision support system implemented, the following changes are expected:

- Average time to first dose will be decreased;
- Eliminate illegible medication orders;
- Eliminate unacceptable abbreviations;
- Eliminate omission errors; and,
- Eliminate transcription errors

Champlain Valley Physicians Hospital Medical Center

Title of Poster: **North Country Pharmaceutical Patient Safety Project**

Project Staff: Elena Napper, Pharm. D., Thomas Gosrich, R.Ph., J.D.

Project Leader(s): Michael Garvey Pharm. D.

PROJECT OVERVIEW

In order to increase patient safety and quality of care, a Clinical Pharmacist became a vital component of a multidisciplinary effort to accurately complete admission and discharge medication reconciliation for inpatients at Champlain Valley Physicians Hospital Medical Center (CVPHMC). This project served a rural and largely poor, medically underserved population in Clinton County, New York.

The Clinical Pharmacist reviewed medication reconciliation tools used at admission and discharge. When necessary, the Clinical Pharmacist corrected and completed medication reconciliation. Attendance at daily discharge rounds helped to assist in the identification of patients ready for discharge.

Throughout the course of the project, key connections were made with community partners and health care professionals at CVPHMC. For example, a weekly meeting was held between the Clinical Pharmacist and the Nurse Liaison from the Clinton County Health Department. Vital Link is a single source document that allows patients to maintain their medical history, allergies and current medication list and is provided to patients at discharge. The Clinton County Office for the Aging provided education about the Vital Link Document to local Emergency Medical Services and patients throughout the community.

GOAL AND OBJECTIVE

To increase patient safety and quality of care by improving the medication reconciliation process for admission and discharge utilizing a Clinical Pharmacist working with key community partners. This project will serve a rural and largely poor, medically underserved population in Clinton County.

Seton Health

Title of Poster: **Saving Lives Using an Easily Adoptable, Cost-Neutral, Patient Medication Safety Initiative**

Project Staff: JB Goss, Pi Amin, Latefa Goldberg

Project Leader(s): JB Goss

PROJECT OVERVIEW

- Patient safety and cost reduction are mutually inclusive.
- Patients safety is enhanced and better therapeutic outcomes are ensured by intensive pharmacotherapeutics.
- These efforts are cost-neutral via cost-offset in Formulary expense and decreases in length of stay achieved by optimized therapeutics and adherence to established best practices.

GOAL AND OBJECTIVE

Produce patient safety and cost-avoidance data to demonstrate the effectiveness of our easily reproducible program.

We decreased readmission by 32 % via better and safer use of medications. An independent health care economist valued the cost-avoidance at over \$250,000 for a six month period by using two Clinical pharmacists in our program.

These data reconfirm our previous study in 2007 that found a minimum of \$165,000 saved by one specially trained clinical pharmacist over 1 year.

Both studies found that not only does our program not cost anything to replicate, but it actually generates savings in excess of staffing costs in the amount of \$100,000/year primarily in length of stay reduction.

Further, these data do NOT capture savings we generated by reduction in long term health care risks, readmission, costs to society in lost productivity and litigation for pain and suffering.

Our method deploys a Clinical Pharmacist driven disease-based pharmacotherapeutic model that leverages adherence to best practices and selection of the safest medications for our patients. Using this method we also identified the medications and diagnostic codes most at risk for treatment failures. They are CHF, COPD and Anticoagulation Management.

Ellenville Regional Hospital

Title of Poster: **Ellenville Regional Hospital Medication and Patient Safety Expansion Project**

Project Staff: Ashima Butler, MS, CPCS

Project Leader(s): Michael Stearns, Rph

PROJECT OVERVIEW

Ellenville Regional Hospital's Medication and Patient Safety program successfully established a source of accurate patient medication information that is available to all persons involved in the primary health care of an individual. We have expanded our clinical pharmacy services through medication and patient safety project by collaborating with Albany College of Pharmacy and Health Sciences, The Institute for Family Health site in Ellenville, Matthews Pharmacy, Ellenville Senior Housing and other local practitioners to enable effective hands off communication with standardized universal medication reconciliation list. This has enabled us to create a seamless process of medication management as patient transitions across care settings within and/or across organizations. ERH's medication safety committee has established systems to facilitate medication event reporting and identification, practice transparency by implementing this reporting system, encourage reporting of ADEs and medication errors and share results with staff and organizational leadership on a routine basis. We have implemented medication reconciliation on admission, transfer and discharge, a post discharge call back system, a RPM Performance Improvement project documenting medication event reduction and measuring medication reconciliation, a Universal Medication List of which over

750 were given out, presence at various health fairs, and development of an outreach program with Matthews Pharmacy for access to a clinical pharmacist and a nurse for blood pressure/ blood glucose screenings. Our pharmacist is available to counsel and educate our community, providers and consumers on proper medication use, safety, dosage and interactions, medication reconciliation and disease state management.

GOAL AND OBJECTIVE

- To expand the scope of activities of the existing Medication Safety Committee.
- To develop our Patient Safety and Clinical Pharmacy Collaborative within the Ellenville community and the surrounding areas.

Medication Management Research Network University at Buffalo

Title of Poster: **Pharmaceutical Safety Initiative: Enhancing Patient Safety with Information Technology and Bioinformatics**

Project Staff: Cara Felton, PharmD, Farzia Sayidine, BA, Mark Wrobel, PharmD

Project Leader(s): Gene D. Morse, PharmD

PROJECT OVERVIEW

Medication errors and their impact on health outcomes have led to a national movement to integrate meaningful use of electronic health information technology (eHIT) in patient care. The Pharmaceutical Safety Initiative (PSI) evaluated the efficacy of several medication management approaches including: telepharmacy for centralized medication review; Integration of Health Information Exchange data; medication reconciliation through the Just Ask Campaign; and digitization of medication profiles. The research involved collaboration from numerous medical practice sites, the Western New York Clinical Information Exchange (WNYCIE), and University at Buffalo faculty and developed models for the use of HIT to optimize medication management and promote enhanced patient safety through the integration and exchange of health information. The PSI also investigated and identified barriers to increased adoption and use of ePrescribing in WNY. Through this initiative we have conducted the evaluation and analysis of the NYS DOH Patient Safety Center's Just Ask Campaign, which sought to enhance the communication between the patient and the hospital pharmacist and promote medication health literacy. The pilot initiatives in this PSI have shown the potential value of ePrescribing/EMR and the role of a pharmacist in patient care to enhance medication management, reduce health care costs and improve patient safety through reductions in medication errors.

GOAL AND OBJECTIVE

To conduct an ePrescribing demonstration project to compare medications dispensing accuracy between the "standard of care" dispensing system compared to a seamless, integrated prescriber-pharmacy network utilizing barcode and/or smart card technology and the National Library of Medicine RxNorm drug nomenclature system in patients receiving HIV/AIDS, end-stage renal disease and diabetes medications.

IPRO

Title of Poster: **The Safety and Quality of Prescribing by Medical Residents Study**

Project Staff: Stephanie Cannoe-Petersen, MA

Project Leader(s): Darren M. Triller, PharmD

PROJECT OVERVIEW

Medication-related problems are major contributors to avoidable morbidity and mortality, and unique environmental and system factors may increase the risk of patients encountering problems with prescriptions originating from academic medical centers and issued by medical residents. While emerging electronic prescribing technology has the potential to eliminate some types of prescribing problems, it is unclear whether existing e-prescribing technology has the ability to address problem types most commonly associated with prescriptions issued at large academic medical centers.

The present study captured real-time data on problems encountered with prescriptions presented to pharmacies in close proximity to large academic medical centers in New York. It categorized the problems by type, frequency, and prescriber type (resident, attending physician, or other), and utilized a Technical Expert Panel to characterize the clinical impact of the problems and to determine whether e-prescribing is capable of addressing the most frequently encountered problem types.

GOAL AND OBJECTIVE

The goals of the study were to:

- Evaluate the rate and characteristics of prescription-related problems identified in pharmacies in close proximity to large academic medical centers
- Determine whether available electronic prescribing technology is capable of addressing encountered problem types

Jamaica Hospital Medical Center

Title of Poster: **Improving Pharmacotherapy through Pharmacist Consultation In Transitional and Home Health Care**

Project Staff: A. Canedo, Ph.D., N. Nicholas Pantaleo, MS, R.Ph., Patricia Gentile, DPS, OTR/L, Louis Cosenza, MS, R.Ph., Louis Kaplan, MS, R.Ph, Ann Fitzpatrick, RN

Project Leader(s): A. Canedo, Ph.D., Patricia Gentile, DPS, OTR/L

PROJECT OVERVIEW

This project seeks to determine the clinical efficacy as well as the cost-effectiveness of a pharmacist consultation service to patients discharged from the Transitional Care Unit /Rehabilitation Unit to the community/home health care. The project is a multi- disciplinary collaboration across the continuum of care. It involves The Jamaica Hospital Pharmacy Department, the TCU /Rehab teams, including physicians, nursing, social work and case management, and The Jamaica Hospital Home Health Agency.

GOAL AND OBJECTIVE

The goal is to implement a pharmacist consultation service to reduce adverse drug events and related hospital readmissions.

- Reduce emergency department visits for medically complex, poly-pharmacy patients discharged from a TCU/ REHAB UNIT to the community /home health care.

The objective is to impact on clinical efficacy and to improve cost effectiveness.

- Patients discharged from Jamaica Hospital TCU/ REHAB UNIT to community/ home health care and their family members and/or caregivers will receive a one-hour educational program about the patient's prescribed medications.
- Patients discharged from TCU/ REHAB UNIT to Jamaica Hospital Home Health Agency will participate in a comprehensive in-home medication reconciliation process conducted by a home health nurse in consultation with a pharmacist consultant within 7 days of their date of discharge.
- TCU/REHB UNIT patients discharged who are participating in the pharmacist consultation service will experience a higher level of patient satisfaction and knowledge about their medication regimen.

Kingsbrook Jewish Medical Center

Title of Poster: **Evaluation of the Effectiveness of a Drug Information Center for Patients and Health Professionals at a Community Hospital**

Project Staff: Lauryn Solomon, Pharm.D., Coordinator of Drug Information
Antonia Alafiris, Pharm.D., CGP, Associate Director of Pharmacotherapy Services

Project Leader(s): Henry Cohen, M.S., Pharm.D., FCCM, BCPP, CGP Chief Pharmacotherapy Officer

PROJECT OVERVIEW

A full-time clinical pharmacist responds to drug inquiries, in-person, by telephone, mail, and e-mail regarding drug dosing, adverse drug events and appropriate drug related therapies. Kingsbrook Jewish Medical Center (KJMC) inpatients, discharged patients, and KJMC Community Residents are afforded this service where timely and appropriate medication advice is provided. For each drug information inquiry, the DIC pharmacist will document the call electronically in a customized Microsoft Access database management system recording the following information: unique identifying number of patient inquiry, date and time inquiry received, type of inquiry, caller (KJMC patient versus health care provider), referral source if relevant, requester's name, address, and contact information (unless the caller is anonymous), whether the communication method is via telephone, e-mail, fax, or in-person, question asked, category of request, requester data obtained to answer question, response to question, method of response delivery, references consulted, name of person answering the inquiry and time used to answer the inquiry. Drug information questions will also be entered into a secondary intervention database, Clinical Measures[®], which will enable automatic capture and reporting of required data, such as number of medication errors, adverse drug events, number of physician office, and emergency department visits prevented.

GOAL AND OBJECTIVE

Provide a centralized hospital resource, Drug Information Center, for health professionals and patients in Kingbrook's service area to enhance the quality of patient care and improve patient safety.

Women's & Children's Hospital of Buffalo

Title of Poster: **Incident Reports and Medication Reporting Events in Three Pediatric Emergency Departments in a Research Network**

Project Staff: Richard M. Ruddy, MD, Prashant V. Mahajan, MD, Richard Lichenstein, MD, Cody S. Olsen, MS, Meredith Sonnet, MD, Stephen blumberg, MD, Heather Gramse, MS, Alecia Peterson, MS, Sally Jo Zuspan, RN, MSN, Charles Casper, PhD, Debra York, MPH, Brian Woo, MD, Jardiris Collado

Project Leader(s): Kathleen A. Lillis, MD, James M. Chamberlain, MD, Kathy Shaw, MD

PROJECT OVERVIEW

Incident reporting is widely used in hospitals but has limited effectiveness at improving patient safety at a national level fear of legal consequences and a punitive or regulatory approach have limited sharing among hospitals. Using a collaborative research network, we examined incident reports that involved pediatric Emergency departments (PED) at three hospitals in New York State. In addition, we examined three randomly assigned Emergency department records per day for each of the three PEDs over a 12-month period.

GOAL AND OBJECTIVE

- To classify information from ongoing incident report monitoring, including actual and near-miss medical events (ie. Qualitative surveillance)
- To monitor medication error rates using systematic sampling and review of medical records (i.e., quantitative surveillance)

MAIMONIDES MEDICAL CENTER

Title of Poster: **Increasing Patient's and Caregiver's Knowledge and Awareness of Medication Administration After Discharge**

Project Staff: Joan Evanzia, RN, MSN, Director Training/HR/Regulatory/Grants for MIS
Frederick Cassera RPh, MBA, Director of Pharmaceutical Services
Susan Goldberg, RN, MSN, MPA, AVP Organizational Performance
Dennis Louie, RPh, Clinical Analyst, MIS Department
Cammile Scarciotta, RN, MSN Associate VP Nursing

Project Leader(s): Joan Evanzia, RN, MSN Frederick Cassera, RPh, MBA

PROJECT OVERVIEW

The project will utilize both digital and computer technology to assist patients and their caregivers with the accurate administration of their home medications. Reinforcement will begin in the hospital environment using digital signage. These are strategically located digital monitors that will continuously deliver information to patients and caregivers regarding the administration of their medications at home and questions that they should ask their providers before they are discharged. The signage will be in the prevailing languages of our community; Hebrew, Russian and English. At the time of discharge, the patient will receive his medication discharge information log that will be generated by the computer. The log utilizes easily recognized symbols to give the patient the information of when and how often to take his medication. The patient can take this to his provider on each office visit.

GOAL AND OBJECTIVE

The goal of the project was to develop methods of utilizing current technology, that are patient and caregiver focused, easily readable and maintained and that can be utilized in the patient's home environment and portable between home, hospital physician offices, to increase the safe administration of home medications.

Massena Memorial Hospital

Title of Poster: **Patient Safety with Bedside Medication Verification at Massena Memorial Hospital**

Project Staff: Kelley Tiernan, CFO, Sue Beaulieu MA, RN, Eric Miller, RPH, Marilyn Carr RN, Julie Bradley RN, Leo Tallman RN

Project Leader(s): Marilyn Carr RN, Julie Bradley RN, Leo Tallman RN

PROJECT OVERVIEW

Massena Memorial Hospital received grant funding to support the implementation and training component of the point-of-care bar coding medication administration system. The grant funding was essential to ensuring a successful transition to a computerized “systems” approach to medication management. The focus of our grant project is the prevention of medication errors and providing education on pharmaceutical and patient safety.

Massena Memorial Hospital began using Meditech Bedside Medication Verification system to administer medications to inpatients on Medical, Surgical, Pediatric, Telemetry and Intensive care units April 22, 2010.

Bedside Medication Verification BMV Safety Features:

- Prevents Administration Errors
- Increases Communication between Disciplines
- 5-Rights Ensured through Medication and Patient Scanning

Bedside Medication Verification (BMV) allows caregivers to utilize bar code scanning technology prior to administering medications to confirm patient identity and medication information against data readily available via MEDITECH’s electronic Medication Administration Record. Immediate access to a patient’s current pertinent results and medication administration information greatly reduces preventable medication errors. The use of bar code scanning increases accuracy and efficiency of caregivers completing medication administration records, providing physicians faster and easier access to critical information to manage patient care.

You can use BMV and the eMAR to do the following:

- View critical patient information such as allergies, latest test results, and vital signs
- Document the administration of medications
- Enter comments relating to the administration of medications
- Enter reasons why a medication is not being administered
- Adjust the actual dose being administered
- View and change a medication’s scheduled administration time
- View a medication’s order and dose instructions
- View a medication’s label comments
- View a medication’s clinical indicator
- View a medication’s monograph
- View patient allergies
- View associated data for specific medications.

Note: Audit reports are available to detail the patients electronic Medication Administration Record.

GOAL AND OBJECTIVE

The overall goal of implementing a point-of-care barcode medication administration system is to increase patient safety, reduce medication errors, and reinforce the Medical Center’s commitment to promoting a culture of safety. The overall objective of the proposed grant project is to develop a formalized implementation and training program with the support of Meditech to ensure a smooth transition to the point-of-care barcode medication administration system.

Northeast Health

Albany Memorial and Samaritan Hospital

Title of Poster: **Pharmacist Medication Reconciliation**

Project Staff: Administration, Nursing and Pharmacy

PROJECT OVERVIEW

The team used the Lean tool “Value Stream Mapping” to review the pharmacy workflow. A work plan was developed that would allow changing pharmacist assignments to allow more time for medication reconciliation. Daily huddles with assignments were instrumental in directing the department. The team received real-time information to improve the rate of medication reconciliation.

GOAL AND OBJECTIVE

- Increase medication reconciliation at Albany memorial and Samaritan Hospital by Pharmacists to 100% of patients within twenty four hours of admission
- Increase pharmacy workflow...efficiencies
- Improve efficiencies of transition of care as patients move from one area to another
- Reduce medication errors
- Reduce redundant orders at admission & discharge
- Reduce drug costs/stay
- Increase pt and family awareness
- Reduce waste (drugs, staff time, etc.)
- Reduce diversion & opportunities for controlled substances by our pts.
- Set outcome standards
- Reduce variation in accuracy & completeness of medication reconciliation

South Nassau Communities Hospital

Title of Poster: **Improving Medication Management Following Hospital Discharge through Patient-Centered Education and In-Home Monitoring**

Project Staff: Debra Winchester, RN DON, Dorothy Wolff, RN Home Care Assistant Director of PI/Staff Development, Debra Guerrini RN Director Case Management, Diane Ambrose LMSW, Director of Social Work, Julian Herrero Cultural Initiatives, Michael Autorino, Pharmacist, Meg Gambale, Assistant Risk Manager, Gail Heenan, Nurse Manager, Valella Rhem, Nurse Educator, Patricia Roth, Clinical Nurse Specialist Behavioral Health

Project Leader(s): Maryann Demeo RN, Assistant Vice President for Quality Nancy Helenek Administrative Director for Care Continuum – Home Care

PROJECT OVERVIEW

Primary activities included the creation of culturally and linguistically-appropriate patient medication education materials; the provision of patient-centered medication education for South Nassau Communities Hospital (SNCH) hospital inpatients and their caregivers, with nurses as primary teachers; and, the provision of in-home medication education and monitoring via home care services for patients identified as in need of additional support for safe medication use following hospital discharge. Training was provided to hospital clinical staff regarding new protocols for patient medication education. Training was also provided to selected supervisory and field staff of SNCH Home Care in geriatric medication management to improve clinical outcomes for older home care patients, for whom medication compliance can be particularly challenging. In addition, SNCH Home Care piloted the use of remote medication monitoring devices for home care patients meeting specified medication management risk criteria.

GOAL AND OBJECTIVE

The goal of the project is to improve patient safety and control health care system costs by improving post-discharge medication management for patients of South Nassau Communities Hospital (SNCH).

The objectives were to improve patients' and caregivers' knowledge and understanding of the safe use of prescribed medications through patient-centered education during the hospital stay; to improve in-home medication monitoring and compliance through home care services for patients meeting specified criteria; and, to prevent adverse drug events and hospital re-admission due to problems arising from medication usage in the home.

St. Joseph's Hospital Health Center

Title of Poster: **Preventing Negative Outcomes from Anticoagulation Therapy (P-NOAT)**

Project Staff: Stacy Keppler , Pharm D, BCPS, Karen Whalen BS Pharm, BCPS, Deidre Pierce, Pharm D, BCPS

Project Leader(s): Bernie Delello,BS, Pharm D.

PROJECT OVERVIEW

We plan to utilize a risk potential trigger tool and pharmacist intervention to prevent harm to patients from anticoagulation therapy. This would be accomplished by utilizing a computerized surveillance program based on defined triggers to identify patients progressing toward a negative outcome; having an Anticoagulation Program Management Pharmacist intervene in the patient's care before the negative outcome actually occurs; and, identifying and empowering an Anticoagulation Program Management Pharmacist to oversee the safe and effective use of anticoagulants in the hospitalized patient.

GOAL AND OBJECTIVE

The overall goal of Preventing Negative Outcomes from Anticoagulation Therapy (P-NOAT), is to decrease the number of negative outcomes for patients at St. Joseph's Hospital Health Center from the use of anticoagulants.

St. Elizabeth Medical Center

Title of Poster: **Implementation of a Point-of-Care Bar Code Medication Administration System**

Project Staff: Kathy Ward, MA, RN Mary Koury, R.Ph Angela Renzi, R.Ph Chris Todd, PharmD Mike Millett, RN

Project Leader(s): Kathy Ward, MA, RN Mike Millett, RN

PROJECT OVERVIEW

St. Elizabeth Medical Center received grant funding from Health Research Inc. (HRI) to support the implementation and training component of the point-of-care bar coding medication administration system. The grant funding was essential to ensuring a successful transition to a computerized “systems” approach to medication management. The focus of our grant project is the prevention of medication errors and providing education on pharmaceutical and patient safety.

St. Elizabeth Medical Center selected Horizon Admin-Rx for our point-of-care medication administration system. The Admin Rx system is designed to receive and display real time patient medication orders that are processed through the pharmacy’s order-entry system. It allows for automated administration and charting of scheduled orders. The Admin Rx application validates the pharmacy- entered orders against the five rights of administration to help ensure safe medication administration procedures; shifting to a “systems” check approach away from an individual/human check approach.

GOAL AND OBJECTIVE

The overall goal of implementing a point-of-care barcode medication administration system is to increase patient safety, reduce medication errors, and reinforce the Medical Center’s commitment to promoting a culture of safety. The overall objective of the proposed grant project is to develop a formalized implementation and training program with the support of McKesson to ensure a smooth transition to the point-of-care barcode medication administration system.

Staten Island University Hospital

Title of Poster: **Study of Improved Efficacy, Safety and Compliance to Administer Insulin In Pen Devices Vs Vials and Syringes = Discovery of Barriers to Insulin Initiation**

Project Staff: Debra Marotta RN, BS, CDE (Diabetic Educator), Michael Coyne, MS, RPh (Pharmacy Project Director, Cynthia D'Auria, RN, BSN, CIC (Patient Safety Project Director), Janemarie Viscardi, BS, MS, Pharm.D. (Co- Investigator), Kiera Weiserbs, MHS, PhD (Statistician), Elaena Quattrocchi, BS, Pharm.D. FASHP (Assistant Project Mgr)

Project Leader(s): Jeffrey Rothman, MD, FACP, FACE

PROJECT OVERVIEW

In April 2009 our study team began to develop a trial of insulin pens as compared to syringe-and- vial therapy in an attempt to validate the hypothesis that pen devices improve safety by preventing dosing errors. A second safety assessment examines the relative frequency of hypoglycemia with the two methods of insulin administration. In addition, the study examines the question of whether pen devices increase adherence to therapy compared to syringes and vials. Patient satisfaction is assessed as well, since adherence to therapy is related to patient acceptance of the method of treatment.

Our study group anticipated enrolling up to 235 patients (the number of subjects was based on budgetary considerations). Study entrance required an established diagnosis of diabetes or the discovery of diabetes during the hospitalization. The patient number was felt to be easily achievable given 8,371 patients were discharged from our institution in 2008 with either a primary or secondary diagnosis of diabetes.

After 7 months of pre-screening involving 1,342 patients, 35 patients were enrolled in the trial. In the course of the study it became apparent there were many barriers to initiation of therapeutically appropriate insulin treatment. In addition to performance of the clinical trial related to methods of insulin administration, the study direction shifted to focusing on the identification of barriers to initiation of insulin therapy. Once barriers were identified, a corrective action plan was developed consistent with best practices. The plan involved education of hospitalists, residents, primary care physicians and sub-specialty physicians on the importance of the appropriate use of insulin in the hospital setting and at discharge. Several educational endeavors were undertaken including the creation of both physician and patient education guides.

This project revealed problems related to the appropriate initiation of insulin. This is a cultural and behavioral problem that transcends the importance of the study as originally conceived. These findings will lead to attempts at changing physician behavior and institutional culture. A Certified Diabetic Educator will remain on staff post-study to accomplish these changes.

University Hospital at Stony Brook

Title of Poster: **Polypharmacy in the Elderly: Utilizing an IT Program and an Emergency Department Pharmacy Consult for Medication Debulking, Adverse Drug Event Detection, and Cost Savings**

Project Staff: Caesar Alaienia, Pharm.D., Sunil George, M.D., Mary Giouroukakis, Pharm.D., Mark Henry, M.D., Sherene Samu, Pharm.D., Dawn Tottenham, M.D.

Project Leader(s): Melina Khwaja, M.D.

PROJECT OVERVIEW

Patients age 65 or older who are on greater than five or more medications and consent to the study will have a licensed pharmacist consultation during their Emergency Department (ED) stay. In addition to standard care from the Emergency physician, the pharmacist will take a full medication reconciliation for each patient. Utilizing computer programs accessible to them at SBUH- Micromedex, lexi-com, and Cerner-the pharmacist will make recommendations regarding the patients home medications. They may suggest removing certain medications because of redundancy, safety profile, or for other reasons which they will explain on their consult. They may recommend substituting existing medications with less costly alternatives that are just as efficacious. The consultation will be given to the Emergency physician who will review the suggestions and make changes accordingly. the pharmacy consultation will also be faxed to the patients PMD's office and attached to the patient's chart so all physicians involved in the patients care will have an opportunity to see the pharmacists recommendations. All patients enrolled will have two follow up calls placed by Emergency Department physicians at approximately 15 and 30 days post discharge from the ED. The PMDs will also receive two phone calls at 15 and 30 days post discharge to home. The follow up ED physician will be focusing on whether the pharmacist recommendations were followed and why or why not. They will specifically be looking at the number of medications the patient was on, and if the total number was reduced and by how many. Also, they will be inquiring about cost savings appreciated by the patient.

GOAL AND OBJECTIVE

The goals of this project were to reduce the number of medications prescribed to the elderly; having pharmacist suggest medications that can be debulked because of various reasons, i.e. redundancy, safety profile; increase physician awareness of potential adverse drug events; having the pharmacist suggest medication changes or debulking because of side effect profile of drug, interaction with patients other drugs or disease state; reduce the cost incurred to the health care system (patient or insurance company); having pharmacist suggest more cost effective drugs and give estimate on cost savings per month if change were to be instituted; and, other measurements such as length of time taken to utilize it systems for medication interactions and potential adverse drug events and length of time to do a thorough medication reconciliation in the ED.

SUNY Downstate Medical Center

Title of Poster: **Pharmaceutical Safety Initiative**

Project Staff: Annie Mooser, BA

Project Leader(s): Muhammad H. Islam, MS, MCH

PROJECT OVERVIEW

The initiative provided bedside education to patients on the medicine and medicine/surgery units regarding treatment for their condition, medication indications, and medication management plan outside of the hospital.

In the second phase of this project, correct response rates for patients who received education and responded to inquiry about the indications of their inpatient medications were noted. During each phase of the initiative, the principal focus of education was inpatient medications and their indications.

GOAL AND OBJECTIVE

This project was an effort to support the existing hospital staff and improve overall patient knowledge and encourage a responsible continuum of care. The overall goal was to nourish a culture of compassionate health care through patient education. Through this enhanced pharmaceutical education and safety initiative, our goal is to maximize patient safety with regard to medication usage.

SUNY Upstate University Hospital

Title of Poster: **Reducing Dispensing Errors in Hospitals Using an Innovative Packaging System to Replenish Automated Dispensing Cabinets**

Project Staff: Robert Wagner, Pharmacist Reviewer
Patricia DeMasso-Anderson, Clinical Research Assistant

Project Leader(s): Steven J. Ciullo, Principle Investigator, Director of Pharmacy Services

PROJECT OVERVIEW

Background:

It is estimated that there are between 380,000 to 450,000 preventable Adverse Drug Effects (ADEs) occurring in the hospital setting annually. Although dispensing error rates are relatively low in hospitals, the high volume of medication dispensed may contribute to 100 or more undetected dispensing errors a day in a busy hospital pharmacy department. An analysis of reported New York State medication errors found that most errors occurred during the administration process (41%) and that dispensing errors (18%) were not as prevalent.

What has not been established is how often unidentified filling and dispensing errors contribute to administration errors. Even when automated pharmacy carousel systems (APCSs) and pharmacy based bar code scanning verification systems are utilized, it is nearly impossible to scan every dose of medication prior to dispensing. Failure to fully read the medication label before dispensing is considered to be one of the most common at-risk behaviors. A pharmacy bar code technology system that does not include scanning every dose of a drug during the dispensing process significantly contributes to frequency of dispensing errors and the potential for ADEs and harm to patients.

GOAL AND OBJECTIVE

The goal of this study is to determine whether using “controlled packaging” in a hospital pharmacy setting would reduce filling and dispensing errors the potential for serious ADEs. “Controlled packaging” is defined as packaging or repackaging of small volume parenterals (SVPs) that takes place under controlled conditions to insure that the contents are consistent with the external labeling. The package labeling includes the drug name, strength, concentration, vial size, expiration date and quantity, as well as bar-code symbology depicting the NDC number or hospital medication ID number.

The cost associated with utilizing a “controlled packaging” strategy was also evaluated to determine the sustainability and replication potential of this medication safety system.



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