Nebraska Center for Rural Health Research

Implementing a Program of Patient Safety in Small Rural Hospitals: Findings and Trends in Medication Error Reporting from 25 Critical Access Hospitals

2005 Data Report
PR06-08

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Executive Summary

In June 2005, the Nebraska Center for Rural Health Research received one of 17 Partnerships in Implementing Patient Safety grants from the Agency for Healthcare Research and Quality (AHRQ). The primary aim of our grant project is to develop the infrastructure necessary for reporting and analyzing medication errors within small rural hospitals and to use this information to implement evidence-based practices that minimize the latent system causes of these errors. This report summarizes the medication error reports voluntarily submitted to MEDMARX in calendar year 2005 by the 25 Critical Access Hospitals in our project. MEDMARX is an anonymous, Internet-accessible reporting system for voluntarily participating hospitals to report and analyze medication errors using standard definitions. Improving patient safety and quality of care occurs locally within organizations. Organizations must use skills in process improvement, culture assessment, teamwork, and voluntary reporting to create reliable processes that provide evidence-based, safe care.[1]

A nonpunitive, voluntary medication error reporting program can assist Critical Access Hospitals to identify system sources of medication errors and to understand the level of safety awareness in their organizations. Differences in reporting patterns between Critical Access Hospitals and all general hospitals reporting to MEDMARX were consistent with the limited presence of pharmacists in the majority of Critical Access Hospitals. The primary action taken in response to error—informing the individual involved—reflects the difficulty of building a just culture that balances individual accountability and improving system reliability. Critical Access Hospitals can decrease the risk to patients associated with medication use by implementing proven medication safety practices consistent with JCAHO's medication-related National Patient Safety Goals and by increasing access to the knowledge base of clinical pharmacists.

Key Findings

- The 14 hospitals that have participated in the project for more than one year demonstrated a positive trend in reporting severity category A, B, and C errors during 2005. This increase in reporting over time reflects growth in a culture of safety that values reporting to provide information about the safety of care.

- Length of time in the project was associated with increased reporting of Category B (*near miss*) errors. The 14 hospitals that had participated in the project for more than one year reported 25% of all errors as Category B, as compared to 12% reported by the 11 hospitals that had participated for less than one year. Reporting Category B errors indicates whether an organization can intercept errors and whether staff value learning about system sources of error without the anxiety associated with harmful events.

- Errors reach patients for four main reasons: procedure/protocol is not followed, transcription and documentation is inaccurate or omitted, there are problems in communication, or workflow is disrupted.

- Project hospitals were most likely to report *informing the individual that was involved in the error* as an action taken as a result of error. The responses to error that were least likely to be reported—*modifying staffing practices, implementing and modifying policies/procedures, implementing computerization,* and *modifying environments*—are more likely to improve the reliability of systems than is *informing individuals.*

- Errors involving high alert medications, which include *blood coagulation modifiers, insulin,* and *opioid* analgesics, are most likely to require monitoring/intervention (Category D) and to result in harm (Categories E–F).

Next Steps

During the remainder of the project, we will continue to address the main reasons that medication errors reach patients. Through interactive workshop activities and conference calls we will (1) teach staff at project hospitals to conduct aggregate and individual root cause analysis to determine system sources of errors and whether new policies/procedures are needed to ensure systems are consistent with evidence-based safe medication practices, and (2) teach staff a structured approach to improving teamwork within project hospitals to improve communication and provide skills in workload management. Finally, we will reassess the culture of safety within each organization using the AHRQ Hospital Survey on Patient Safety Culture.

Medication Error Reports Submitted to MEDMARX by Project Hospitals in 2005

The 25 project hospitals submitted 2,953 reports to MEDMARX in 2005 (green line). The 14 hospitals that began the project before September 2005, Phase One, submitted 2,425 reports (blue line). The number of reports submitted by these 14 Phase One hospitals ranged from 52 to 751. The 11 hospitals that began the project in September 2005, Phase Two, submitted 528 reports (pink line). The number of reports submitted by these 11 Phase 2 hospitals ranged from 5 to 170 (Figure 1, Table 1).

Figure 1. Medication Error Reports by Project Phase: Project Hospitals (n = 25), 2005

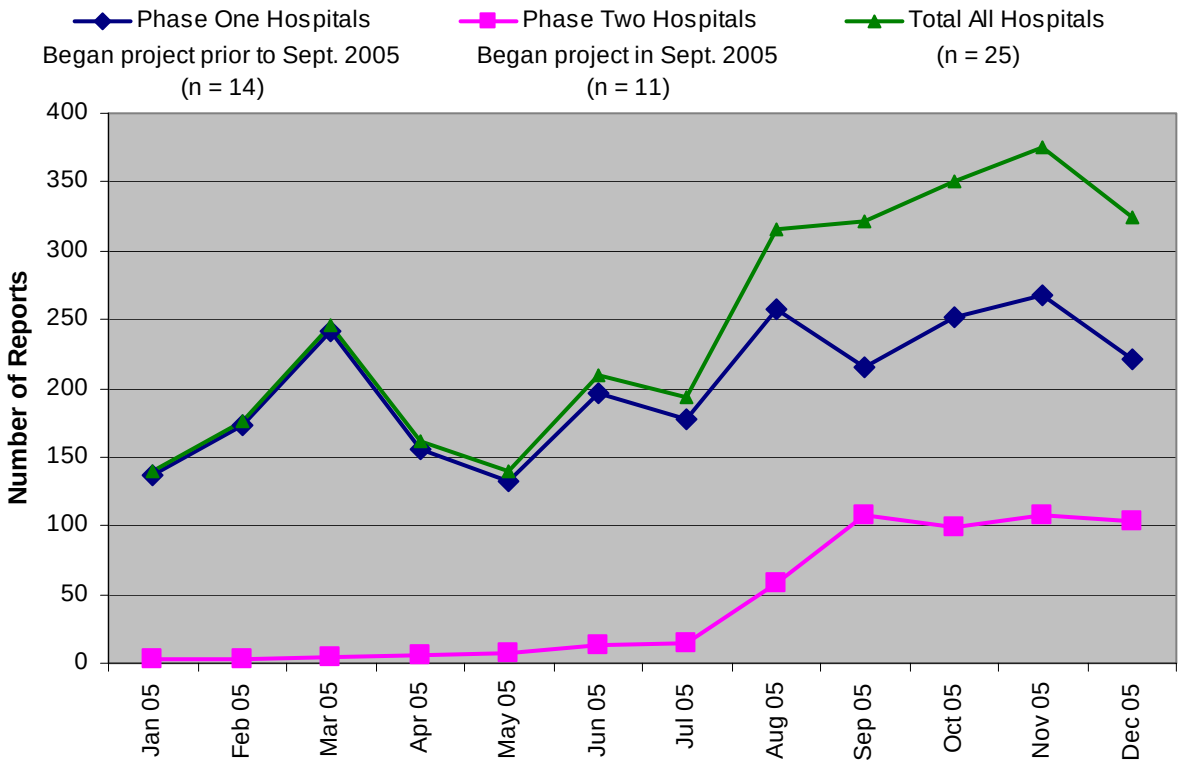


Table 1. Number of Facilities and Reports Submitted to MEDMARX, 2004 and 2005

	2004				2005			
	Facilities		Reports		Facilities		Reports	
Type of Facility	n	%	n	%	n	%	n	%
Critical Access Hospital	33	5.4	4,390	1.8	50	8.5	6,221	2.8
Project Hospitals, Phase 1*					14		2,425	
Project Hospitals, Phase 2**					11		528	
General Community Hospital	404	65.6	193,565	77.8	371	62.9	165,348	74.8
Ambulatory or other outpatient clinic	93	15.1	11,009	4.4	96	16.3	11,118	5.0
University Hospital	38	6.2	28,414	11.4	33	5.6	60,617	13.9
Other	48	7.8	11,355	4.6	40	6.8	7,696	3.5
Total	616		248,733		590		221,000	

Source: United States Pharmacopeia, 2006 (Data on File).

*Phase 1 Critical Access Hospitals began reporting to MEDMARX prior to September 2005.
**Phase 2 Critical Access Hospitals began reporting to MEDMARX in September 2005.

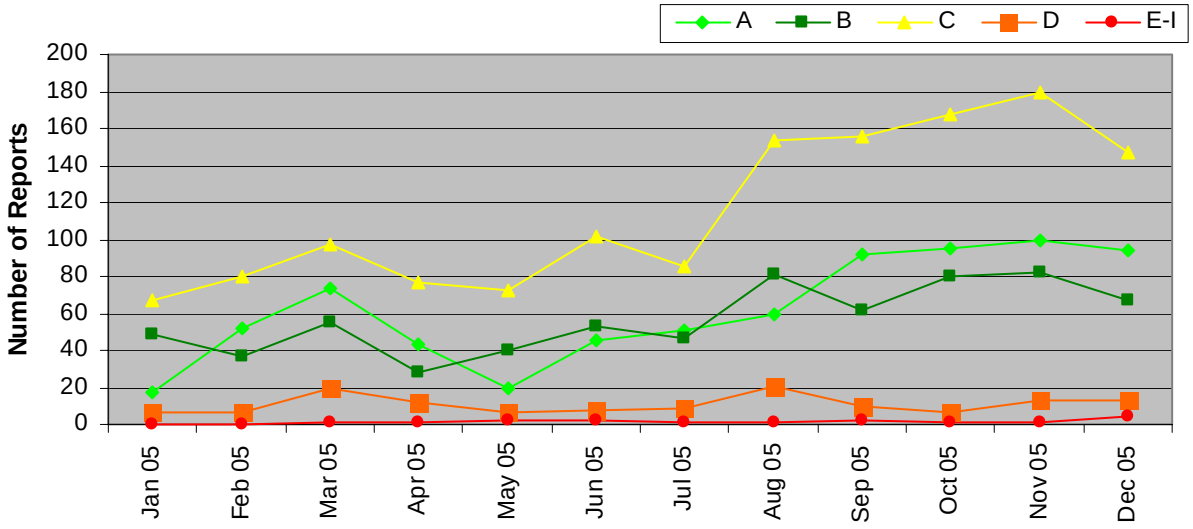
Medication Error Reports by Severity Category

MEDMARX uses the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) taxonomy to categorize the severity of reported errors according to the outcome for the patient. This report provides the number and percentage of error reports in four severity categories: (1) all errors (A–I), (2) actual errors that may or may not have reached the patient (B–I), (3) errors that reached the patient (C–I), and (4) errors that reached the patient and caused harm/death (E–I). Approximately 48% of all reports from project hospitals were *potential* (Category A) and *near miss* (Category B) errors that were intercepted before reaching the patient. Category B error reports represent opportunities to learn about the robustness of safety systems in hospitals without an error reaching the patient. The 2,953 reports submitted by project hospitals in 2005 are categorized by severity in Table 2 and Figure 2.

Table 2. Distribution of Medication Error Reports by Severity Category: Project Hospitals (n = 25), 2005

		All Errors Category A-I n = 2,953 (100%)		Actual Errors Category B-I n = 2,212 (75%)		Errors That Reached the Patient Category C-I N = 1,531 (52%)		Errors That Reached the Patient and Caused Harm or Fatality Category E-I n = 15 (0.5%)	
Error Category	Result of Error	Number of Errors	% of Total	Number of Errors	% of B-I	Number of Errors	% of C-I	Number of Errors	% of E-I
No Error									
Category A	Circumstances or events that have the capacity to cause error.	741	25.09%	N/A		N/A		N/A	
Error, No Harm									
Category B	An error occurred, but the error did not reach the patient (an "error of omission" does reach the patient).	681	23.06%	681	30.79%	N/A		N/A	
Category C	An error occurred that reached the patient but did not cause patient harm.	1.385	46.90%	1,385	62.61%	1.385	90.46%	N/A	
Category D	An error occurred that reached the patient and required monitoring to confirm that it resulted in no harm to the patient and/or required intervention to preclude harm.	131	4.44%	131	5.92%	131	8.56%	N/A	
Error, Harm									
Category E	An error occurred that may have contributed to or resulted in temporary harm to the patient and required intervention.	11	0.37%	11	0.50%	11	0.72%	11	73.33%
Category F	An error occurred that may have contributed to or resulted in temporary harm to the patient and required initial or prolonged hospitalization.	4	0.14%	4	0.18%	4	0.26%	4	26.67%
Category G	An error occurred that may have contributed to or resulted in permanent patient harm.	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Category H	An error occurred that required intervention necessary to sustain life.	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Error, Death									
Category I	An error occurred that may have contributed to or resulted in the patient's death.	0	0.00%	0	0.00%	0	0.00%	0	0.00%
		2,953	**100.00%**	**2,212**	**74.91%**	**1,531**	**51.85%**	**15**	**0.51%**

Figure 2. Medication Error Reports by Severity Category: Project Hospitals (n = 25), 2005



Medication Error Reports by Severity Category by Project Phase

The 14 Phase One hospitals demonstrated a positive trend (black line) in reporting Category A, B, and C errors (Figure 3). This increase in reporting over time reflects growth in the culture of safety that values reporting to provide information about safety systems. As the culture of safety matures within an organization, quality improvement activities that increase the reliability of safety systems should result in increased reporting of Category A and B errors and a decrease in errors that reach the patient (C–I).[2] The 11 Phase Two hospitals began the project in September 2005; therefore, not enough information is available for 2005 to analyze trends (Figure 4).

Figure 3. Medication Error Reports by Severity Category: Phase One Hospitals (n = 14), 2005

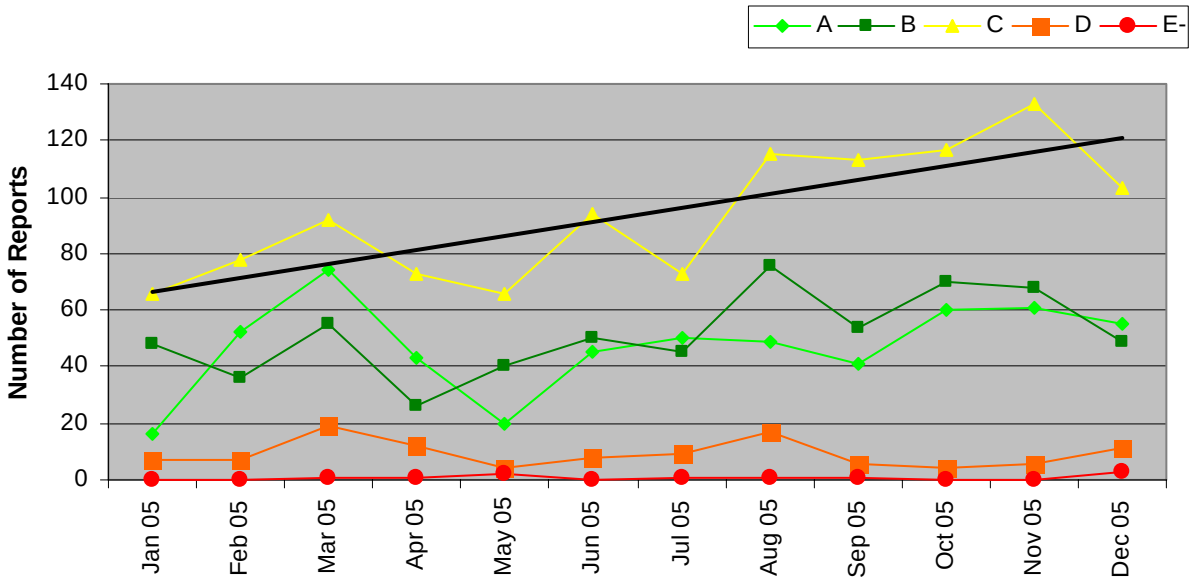
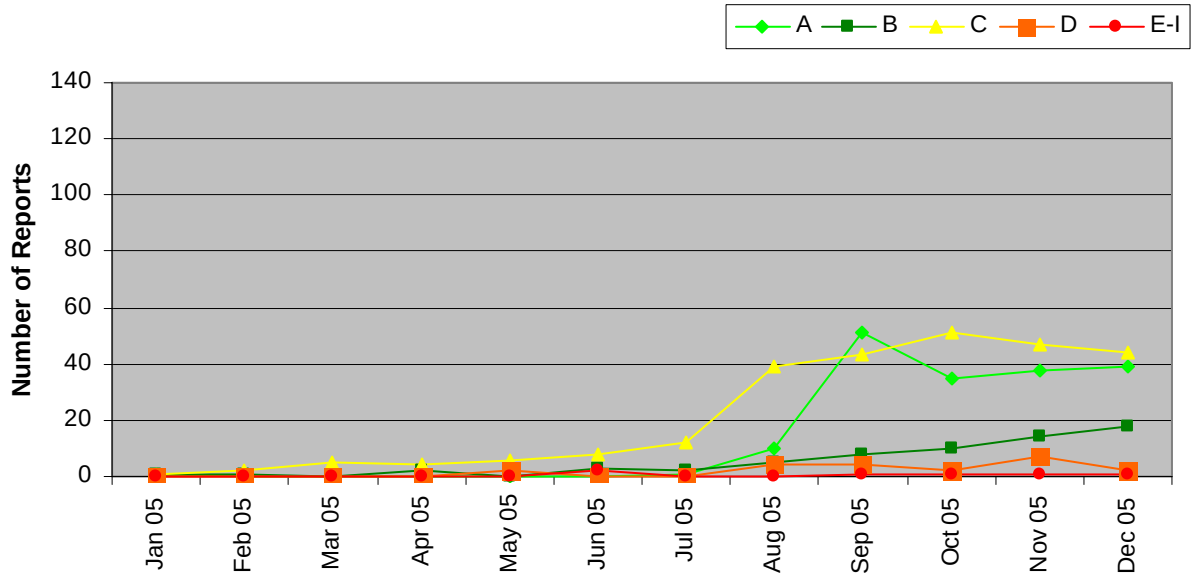


Figure 4. Medication Error Reports by Severity Category: Phase Two Hospitals (n = 11), 2005



Comparison of Medication Error Reports by Severity Category Between Project Hospitals and the MEDMARX National Database

In calendar year 2004, MEDMARX received 248,733 reports from 616 hospitals.[3,4] Approximately 57% of these reports were Category A or B reports of *potential* (A) and *near miss* (B) errors that were detected before reaching the patient (Figure 5). In comparison, 48% of reports from the 25 project hospitals were Category A and B (Figure 6). The largest difference in reporting between MEDMARX and the 25 project hospitals was in the proportions of errors reported as Category B. Specifically, the proportion of Category B errors reported to the national database (43%) was nearly twice as large as that reported by project hospitals (23%). Phase One hospitals reported a proportion of Category B errors (25%) twice as large as that of the Phase Two hospitals (12%) (Figures 7 and 8). The reporting of Category B errors ranges from 0% to 54% across the 25 project hospitals and is a reflection of the culture of safety within the organization. Project hospitals can use this information to "benchmark to the best" by creating a goal to submit 54% of their error reports as Category B.

Figure 5. Medication Error Reports by Severity Category: All MEDMARX Hospitals (n = 616), 2004

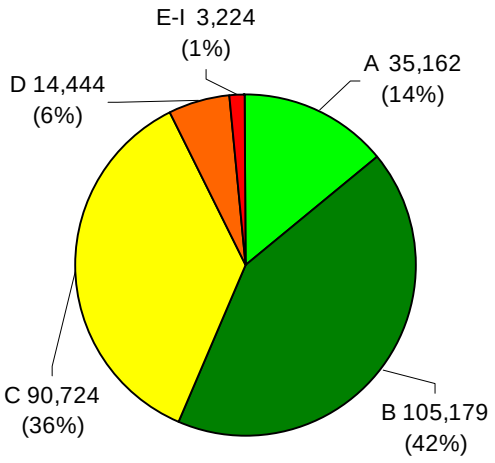


Figure 6. Medication Error Reports by Severity Category: Project Hospitals (n = 25), 2005

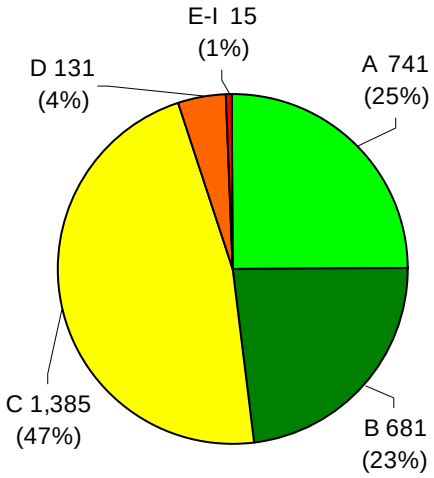


Figure 7. Medication Error Reports by Severity Category: Phase One Project Hospitals (n = 14), 2005

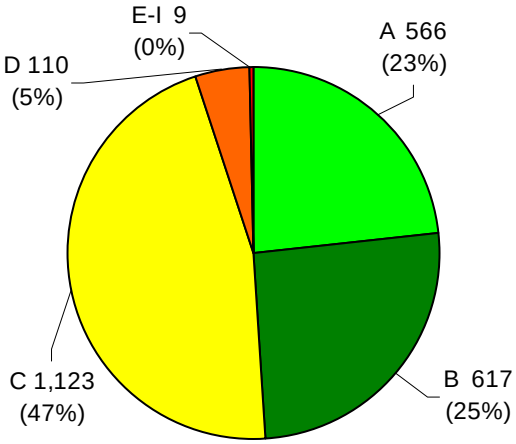
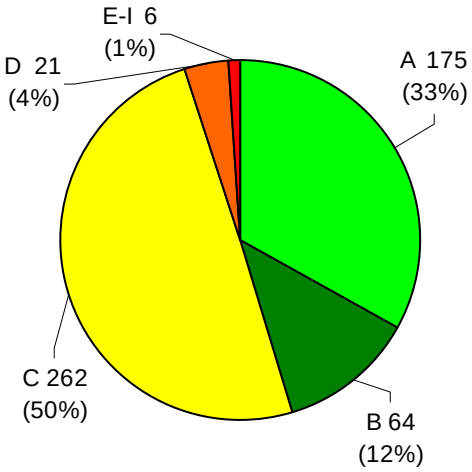


Figure 8. Medication Error Reports by Severity Category: Phase Two Project Hospitals (n = 11), 2005



Comparison of Medication Error Reports by Process Node Between Project Hospitals and MEDMARX National Database

The process node identifies the phase of the medication use process in which the error originated for Category B–I reports. The six nodes are (1) *procurement* (introduced in 2005), which is ordering of inventory for the facility; (2) *prescribing;* (3) *transcribing/documenting;* (4) *dispensing*, which begins with a pharmacist's assessment of a medication order; (5) *administering*, which includes the "7 Rights"—the *right* dose of the *right* medication is given to the *right* patient at the *right* time by the *right* route for the *right* reason and is documented in the *right* way; and (6) *monitoring*—evaluating the patient's response to the medication. Identifying the phase of origination of an error is necessary to correctly identify and correct its system source. Reports by all hospitals reporting to MEDMARX are relatively balanced across the five main nodes (Figure 9).[3,4] The 25 project hospitals reported smaller percentages of errors originating in the *prescribing* and *dispensing* nodes than did all hospitals reporting to MEDMARX due to the limited presence of on-site pharmacy support (Figures 10–12). Lack of pharmacy support decreases the probability that prescribing and drug selection errors will be detected and reported. Errors made in drug selection by nurses originate in the *administering* phase. Nurses can use software such as Micromedex to check for drug-drug and drug-disease interactions. This check is not a substitute for the clinical knowledge of a pharmacist.

Figure 9. Medication Error Reports by Process Node: All MEDMARX Hospitals (n = 616), 2004

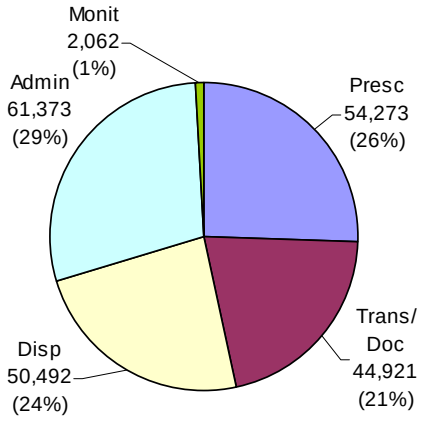


Figure 10. Medication Error Reports by Process Node: Project Hospitals (n = 25), 2005

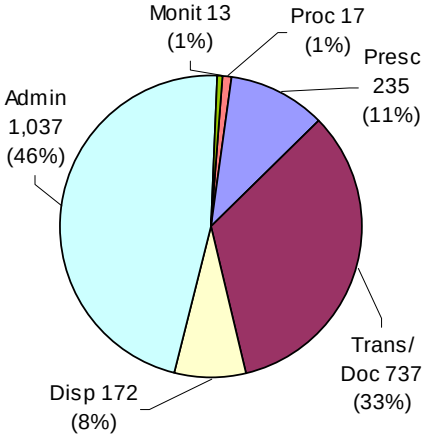


Figure 11. Medication Error Reports by Process Node: Phase One Project Hospitals (n = 14), 2005

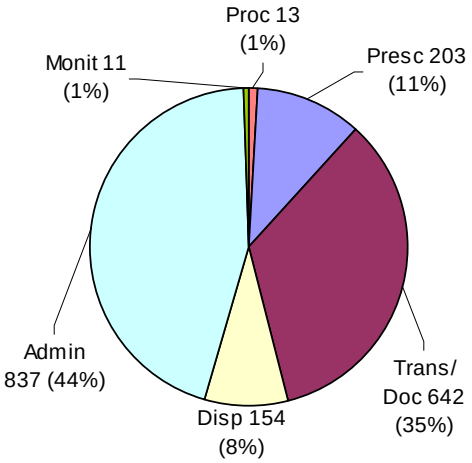
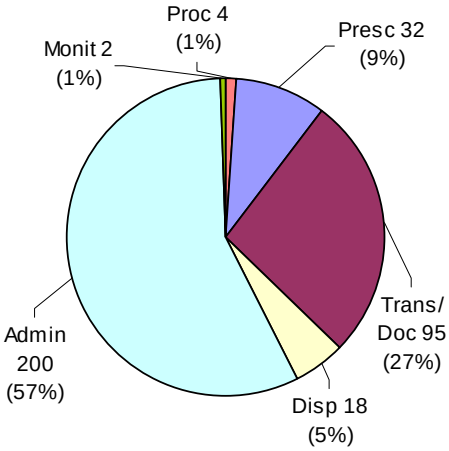


Figure 12. Medication Error Reports by Process Node: Phase Two Project Hospitals (n = 11), 2005



Note: In Figures 9–12, the abbreviations stand for the following: "Proc" for the *procurement* node; "Presc" for the *prescribing* node; "Trans/Doc" for the *transcribing/documenting* node; "Disp" for the *dispensing* node; "Admin" for the *administering* node; and "Monit" for the *monitoring* node.

Types of Medication Errors Reported

MEDMARX identifies 14 different types of errors. More than one type of error can be selected in each report. The top five types of errors reported to MEDMARX from 2000 to 2004 accounted for 87% of reports. These five were *prescribing error* (24%), *improper dose/quantity* (24%), *omission error* (21%), *unauthorized drug* (11%), and *wrong time* (7%) (Figure 13).[3,4] The top five types of errors reported by the 25 project hospitals accounted for 91% of reports. These five were *omission error* (24%), *improper dose/quantity* (23%), *extra dose* (20%), *unauthorized drug* (15%), and *wrong time* (9%) (Figure 14). The fact that the 25 project hospitals reported a smaller percentage of *prescribing errors* (7%) as compared to MEDMARX (22%) reflects the limited presence of on-site pharmacy support in Critical Access Hospitals. Medication use is intended to be multidisciplinary, with a system of double checks between physicians, pharmacists, and nurses. Without the active participation of pharmacists, fewer prescribing errors are detected, reported, and prevented.

Figure 13. Types of Medication Errors (All Categories): All MEDMARX Hospitals, 2000–2004

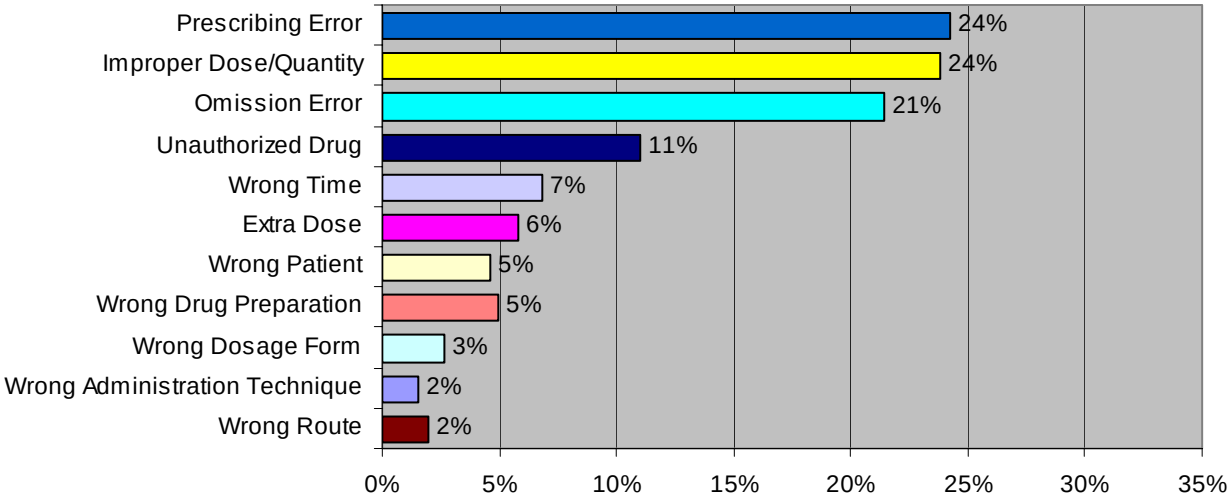
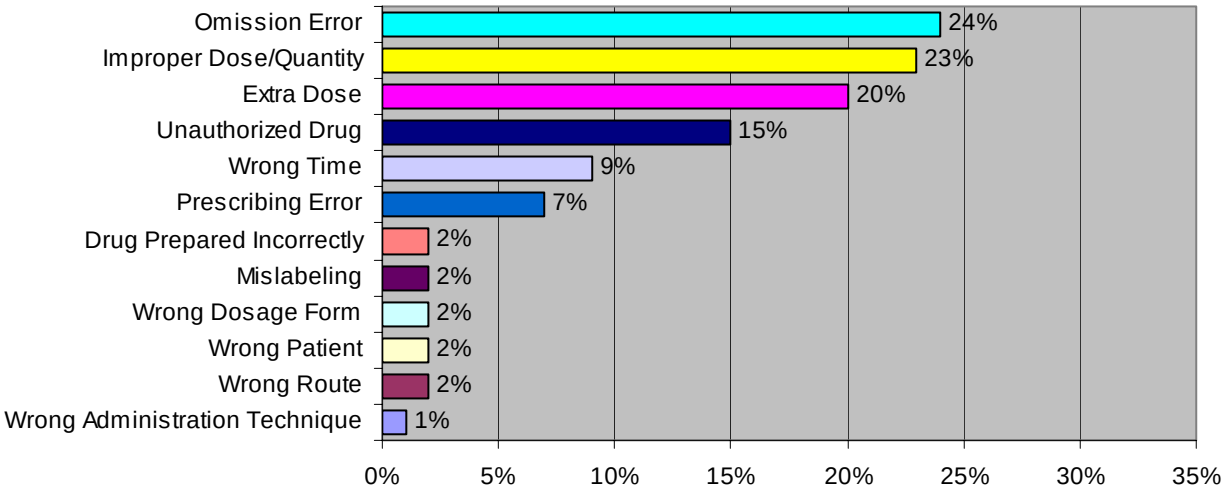


Figure 14. Types of Medication Errors (All Categories): Project Hospitals (n = 25), 2005



Types of Medication Errors by Severity Category

Medication safety teams can divide each type of error by severity category to determine which types of errors their medication safety systems can intercept before reaching the patient. Project hospitals were most likely to intercept *extra dose* errors (32%), *improper dose/quantity* errors (27%), *unauthorized drug* errors (16%), *prescribing errors* (11%), and *omission errors* (8%) (Figure 15). *Extra dose* was the top error type selected in Category A and B reports. The most frequent cause of these potential *extra dose* errors was not signing the medication administration record after a medication was administered. Without documentation, the patient may receive an extra dose of medication. The top three types of errors that did reach the patient were *omission error* (40%), *improper dose/quantity* (18%), *unauthorized/wrong drug* (15%), *wrong time* (13%), and *extra dose* (8%) (Figure 16).

Figure 15. Types of Medication Errors, Categories A–B: Project Hospitals (n = 25), 2005

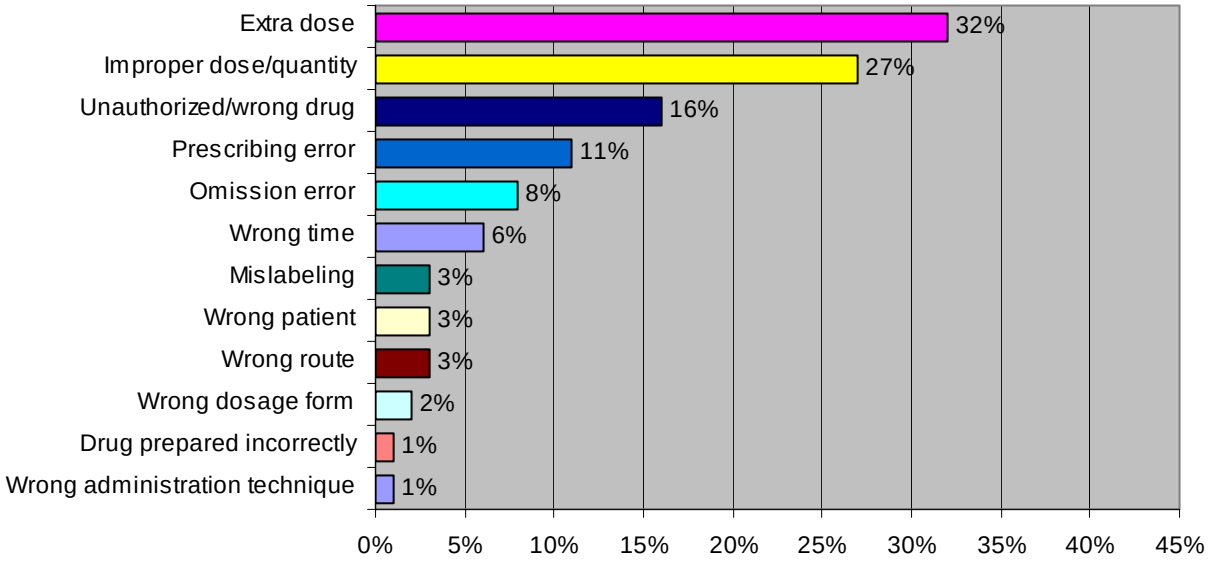
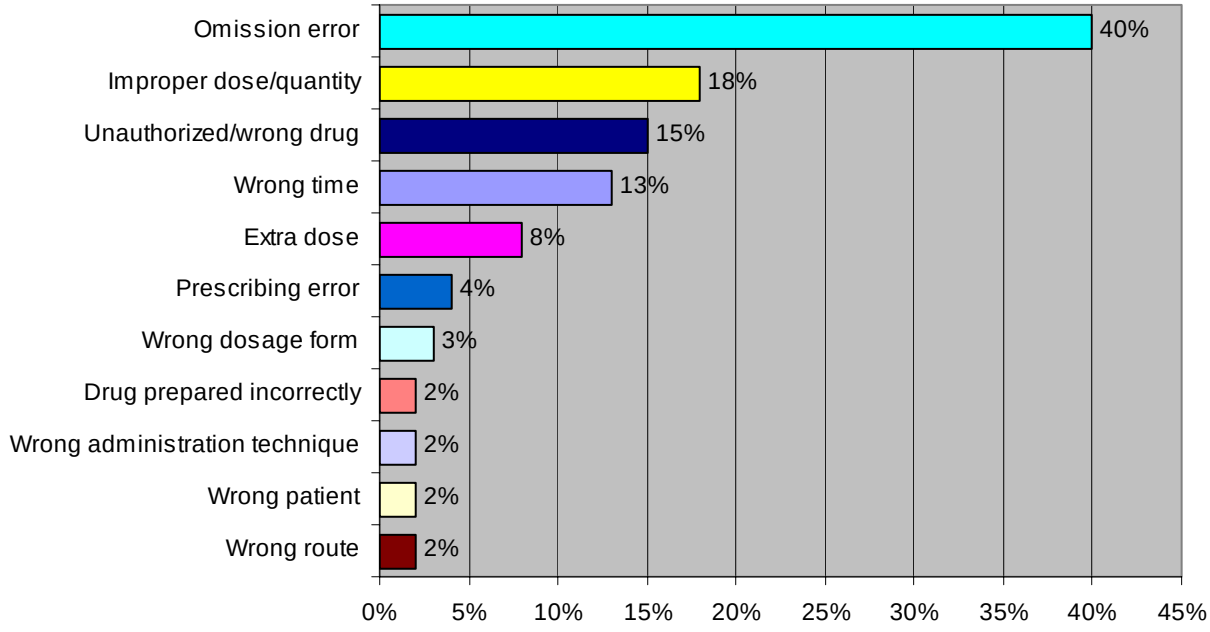


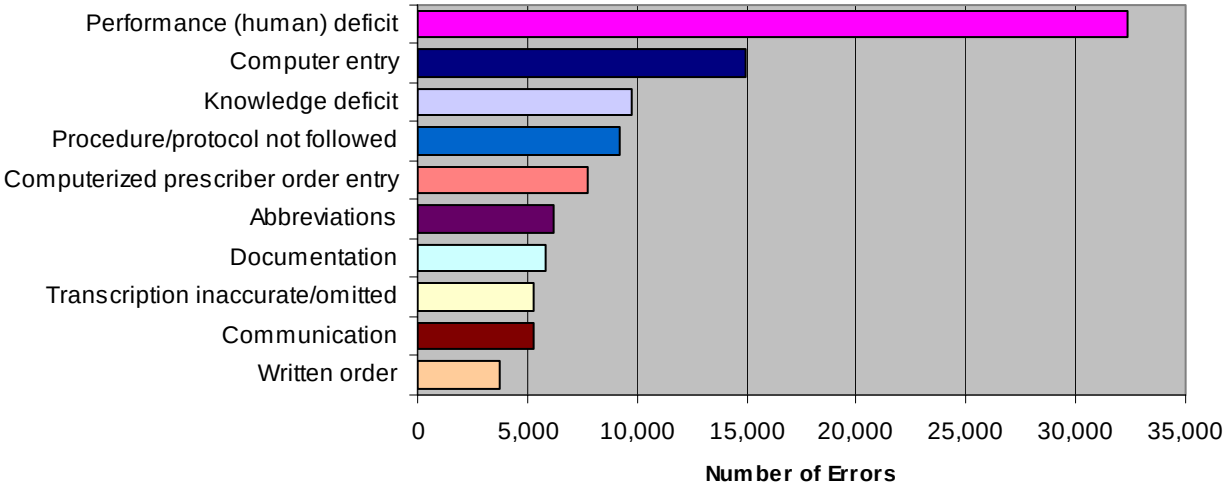
Figure 16. Types of Medication Errors, Categories C–I: Project Hospitals (n = 25), 2005



Top Causes of Errors for Severity Categories A–B

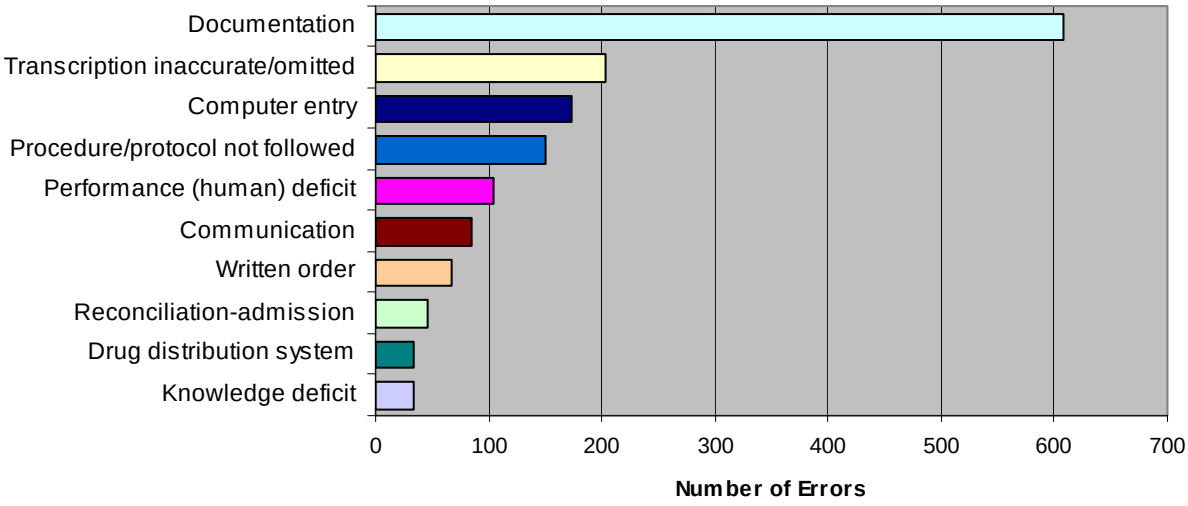
Excluding *performance (human) deficit*, seven of the nine top causes of intercepted errors reported to MEDMARX by all general hospitals and by project hospitals in 2005 were similar, which reflects double checks in the *ordering* and *documenting* phases (Figures 17 and 18). The presence of *computerized prescriber order entry* as a top cause of intercepted errors by all general hospitals reflects the role of this technology in intercepting prescribing errors. The presence of *abbreviations* as a top cause reported by all general hospitals reflects the emphasis that JCAHO-accredited hospitals have placed on not using inappropriate abbreviations—a National Patient Safety Goal (Figure 17). The presence of *reconciliation-admission* as a top cause of intercepted errors among project hospitals indicates the emphasis some project hospitals have placed on this National Patient Safety Goal. Finally, the fact that project hospitals identified *drug distribution system* as a top cause of intercepted errors indicates the need to increase the reliability of drug distribution within project hospitals (Figure 18).

Figure 17. Top Causes of Errors, Categories A–B: MEDMARX General Hospitals (n = 371), 2005



Source: United States Pharmacopeia, 2006 (Data on File).

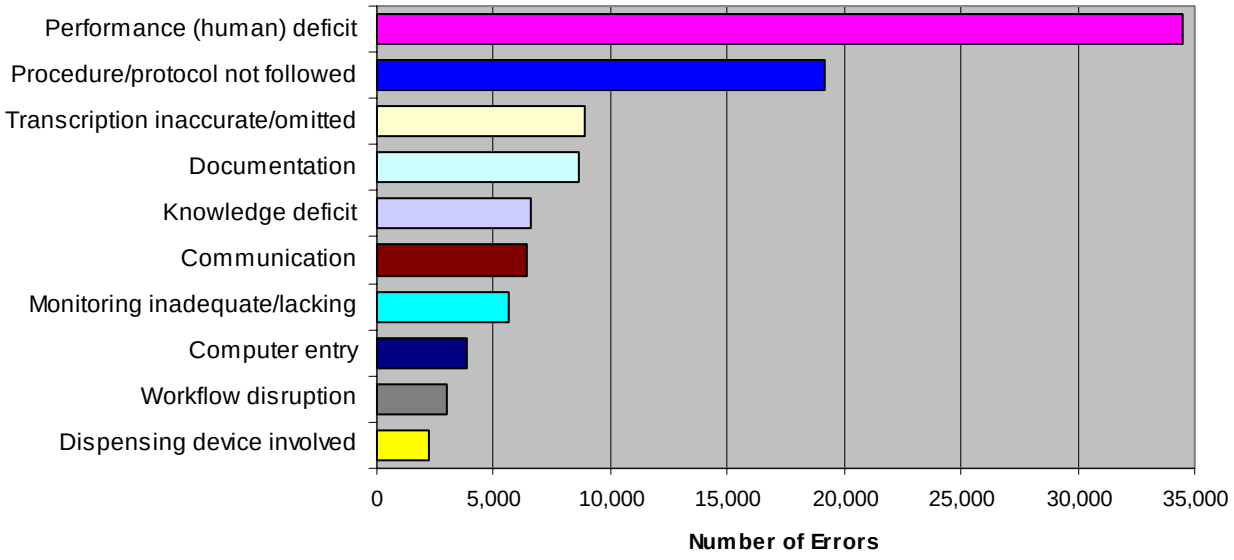
Figure 18. Top Causes of Errors, Categories A–B: Project Hospitals (n = 25), 2005



Top Causes of Errors for Severity Categories C–I

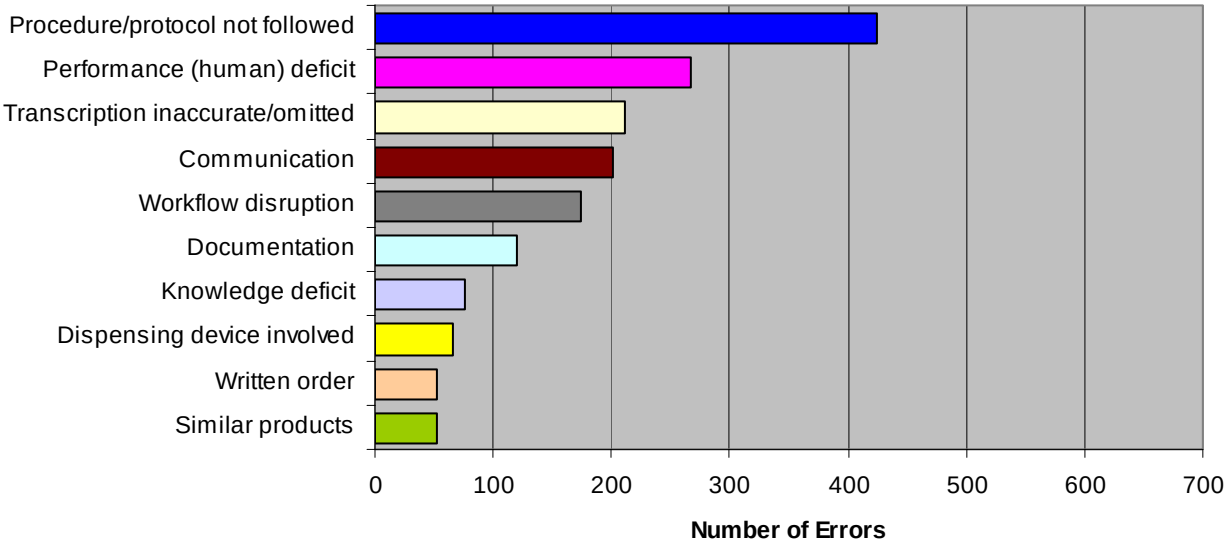
All general hospitals and project hospitals reported similar causes of errors that reached the patient. After excluding *performance (human) deficit* as a cause of error, *procedure/protocol not followed* and *transcription inaccurate/omitted* were the top two causes of errors that reached the patient. The importance of effective teamwork to improve communication and manage workflow is reflected by the presence of *communication* and *workflow disruption* as top causes of error. The capacity of technology to not only intercept but also create opportunities for error is reflected by the presence of *dispensing device* as a cause of errors reported by all general hospitals and project hospitals. Lack of pharmacy support among project hospitals may explain why *similar products* and *written order* are top causes of errors that reach the patient among project hospitals but not all general hospitals reporting to MEDMARX (Figures 19 and 20).

Figure 19. Top Causes of Errors, Categories C–I: MEDMARX General Hospitals (n = 371), 2005



Source: United States Pharmacopeia, 2006 (Data on File).

Figure 20. Top Causes of Errors, Categories C–I: Project Hospitals (n = 25), 2005



Actions Taken as a Result of Error

A culture of safety requires a nonpunitive culture to encourage reporting, effective data collection and analysis of reported patient safety events, and implementation and communication of actions taken to prevent similar errors in the future. The actions taken in response to a reported event can be recorded in MEDMARX to document and communicate quality improvement efforts to staff and regulatory bodies such as state surveyors. However, *actions taken* is not a required MEDMARX field, resulting in limited documentation of this important information. The top five actions taken as reported by all general hospitals and project hospitals to MEDMARX[3,4] were similar: *informed staff who made the initial error, informed staff who was also involved in error, communication process enhanced, informed patient's physician,* and *education/training provided* (Figures 21 and 22). Although providing education and training is often necessary, all hospitals must make greater efforts to improve the reliability of processes with forcing functions, constraints, and attention to environmental distractions rather than reliance on human vigilance. Small rural hospitals can work collaboratively to share patient safety policies and procedures.

Figure 21. Actions Taken as a Result of Error: All MEDMARX Hospitals (n = 616), 2004

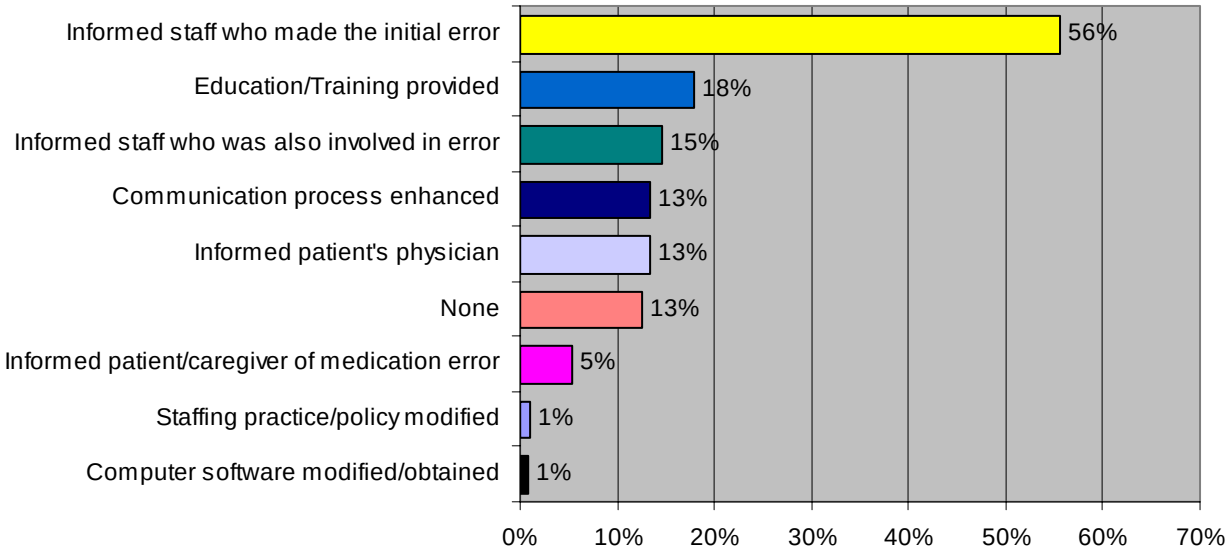
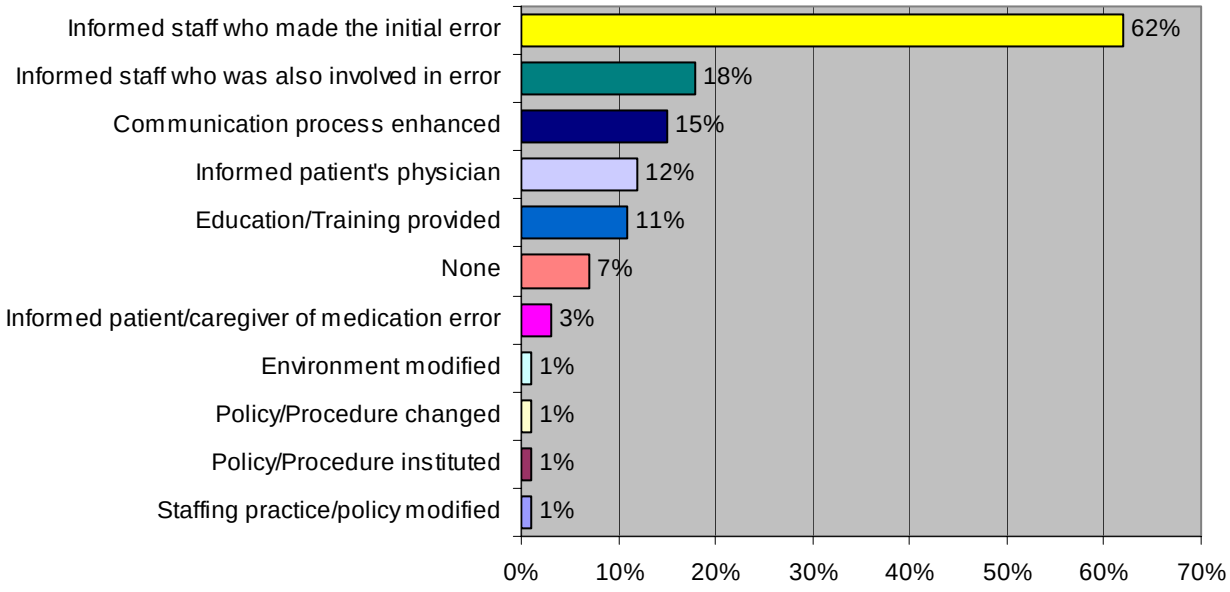


Figure 22. Actions Taken as a Result of Error: Project Hospitals (n = 25), 2005



Error Result on Patient Care

The top five *error results on patient care* reported to MEDMARX by all hospitals[3,4] and project hospitals were similar: *delay in diagnosis/treatment/surgery, drug therapy initiated/changed, observation initiated/increased, laboratory tests performed,* and *vital signs monitoring initiated/increased* (Figures 23 and 24). These results reflect resources expended by an organization to ensure that harm did not occur or to mitigate harm due to an error. Consistent use of this field can provide an estimate of the hidden cost of errors.

Figure 23. Error Result on Patient Care, Categories C–I: All MEDMARX Hospitals (n = 616), 2004

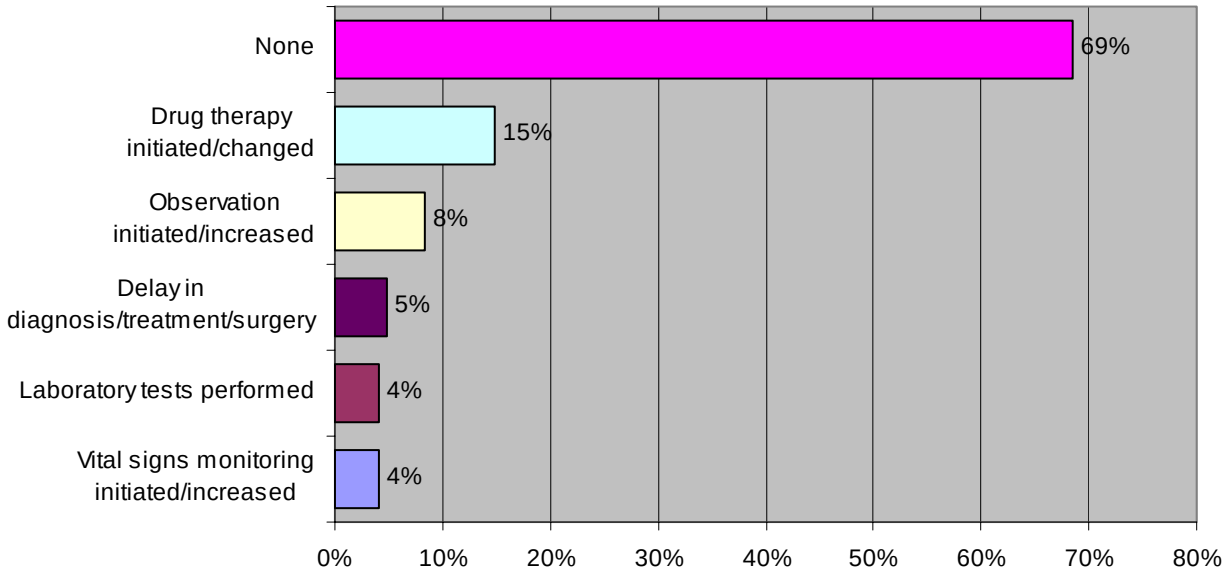
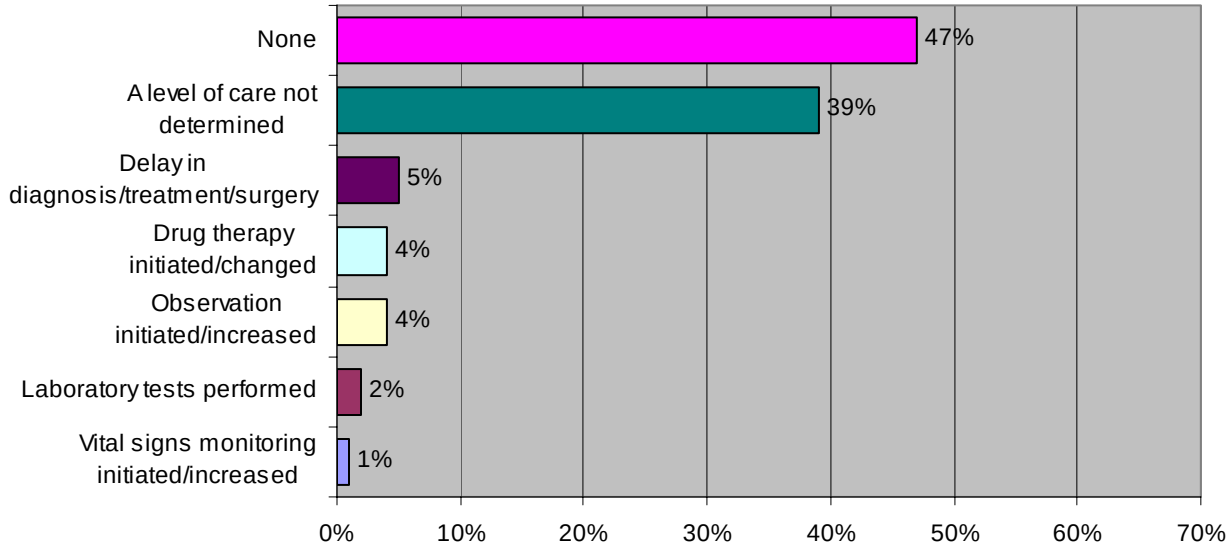


Figure 24. Error Result on Patient Care, Categories C–I: Project Hospitals (n = 25), 2005



Top Medications Reported by Severity

Opioid analgesics and *beta-lactam antimicrobials* were the top therapeutic classes among Category A–B (*potential* and *near miss*) and Category E–I (*harmful*) error reports. However, errors involving the high alert medications *blood coagulation modifiers* and *insulin* accounted for 38% of reported Category D errors, which require interventions to prevent and/or mitigate harm. Of special interest is the fact that errors involving *antiasthma/bronchodilators* frequently reach the patient (Category C) and require monitoring/interventions (Category D) but are not among the therapeutic classes in frequently intercepted errors. Project hospitals should review their policies/procedures for double checks of high alert medications *(blood coagulation modifiers, insulins, opioids)* and for administering *antiasthma/bronchodilators* (Figures 25 through 28 and Tables 3 through 6.

Figure 25. Top Therapeutic Classes Reported, Categories A–B: Project Hospitals (n = 25), 2005

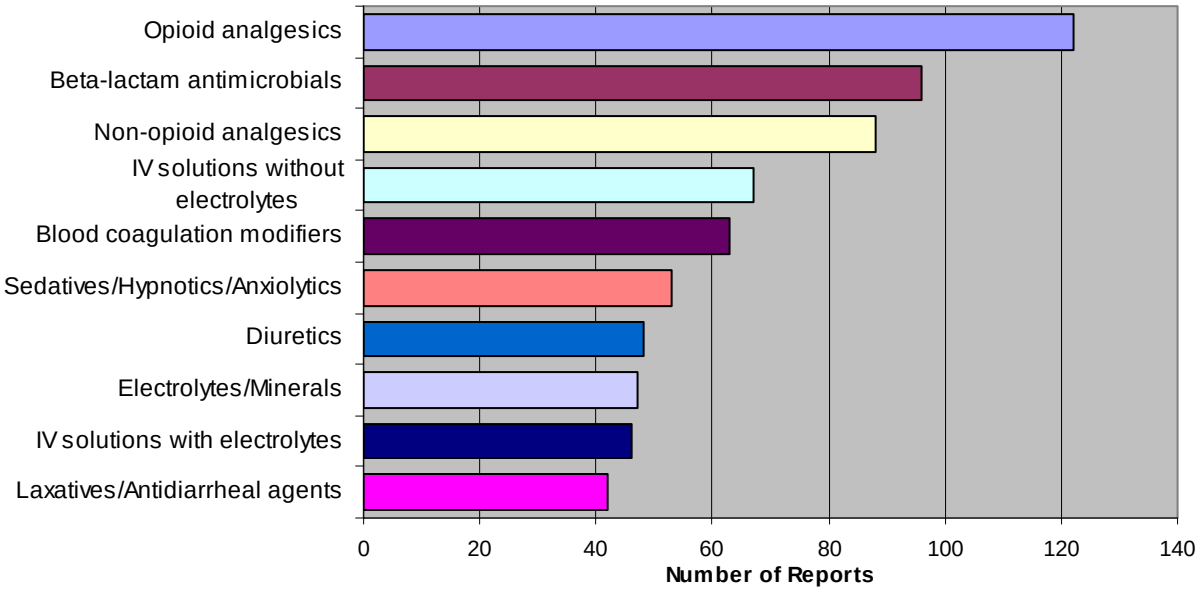


Figure 26. Top Therapeutic Classes Reported, Category C: Project Hospitals (n = 25), 2005

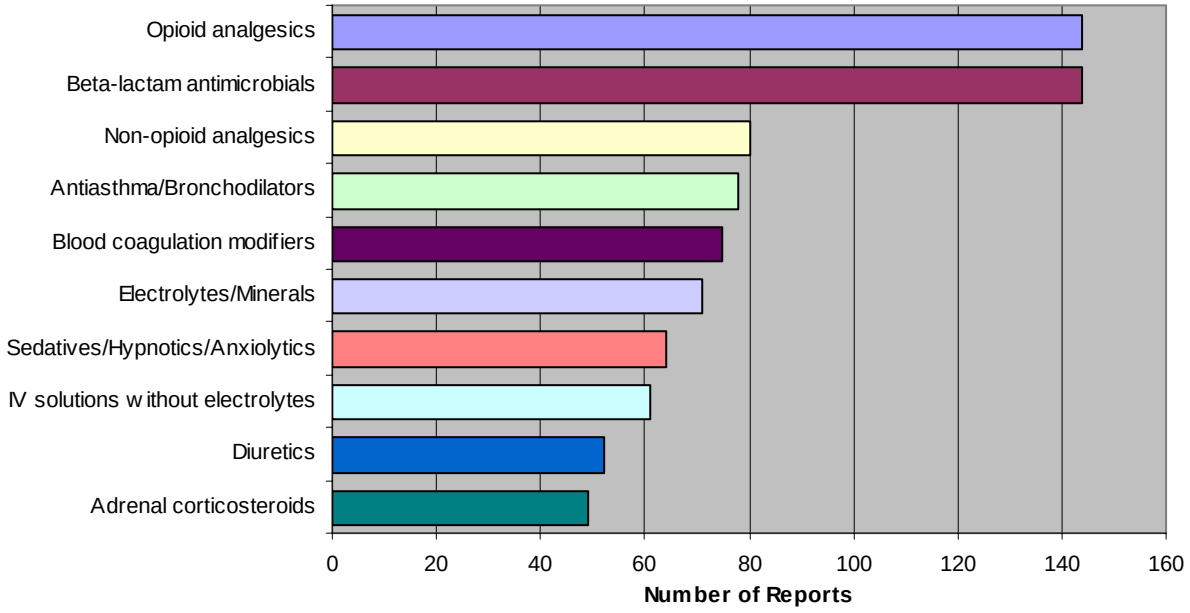


Figure 27. Top Therapeutic Classes Reported, Category D: Project Hospitals (n = 25), 2005

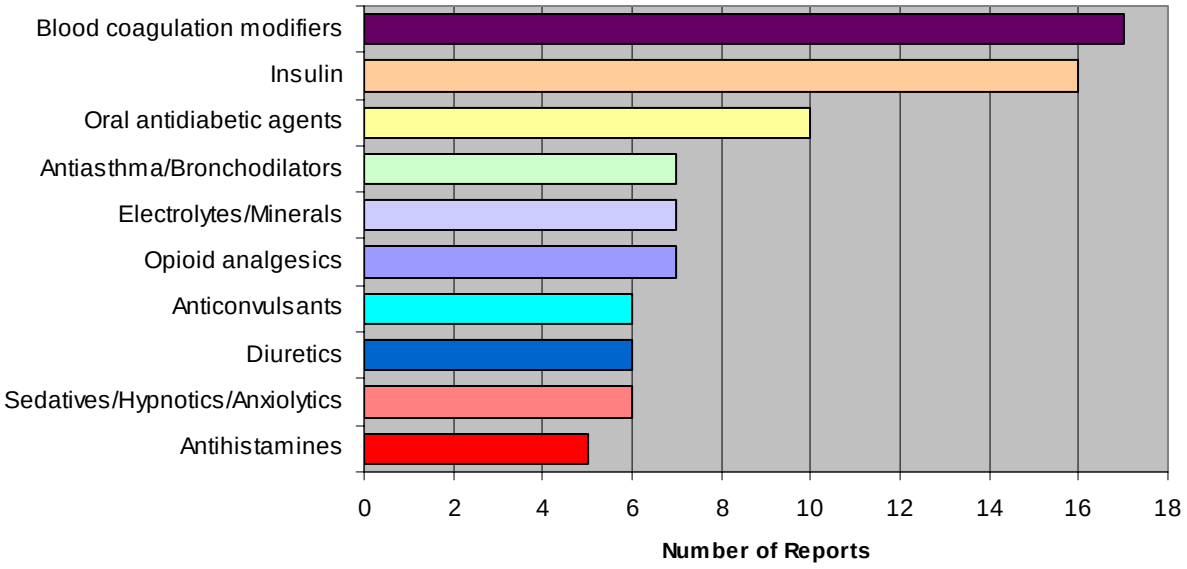


Figure 28. Top Therapeutic Classes Reported, Categories E–I: Project Hospitals (n = 25), 2005

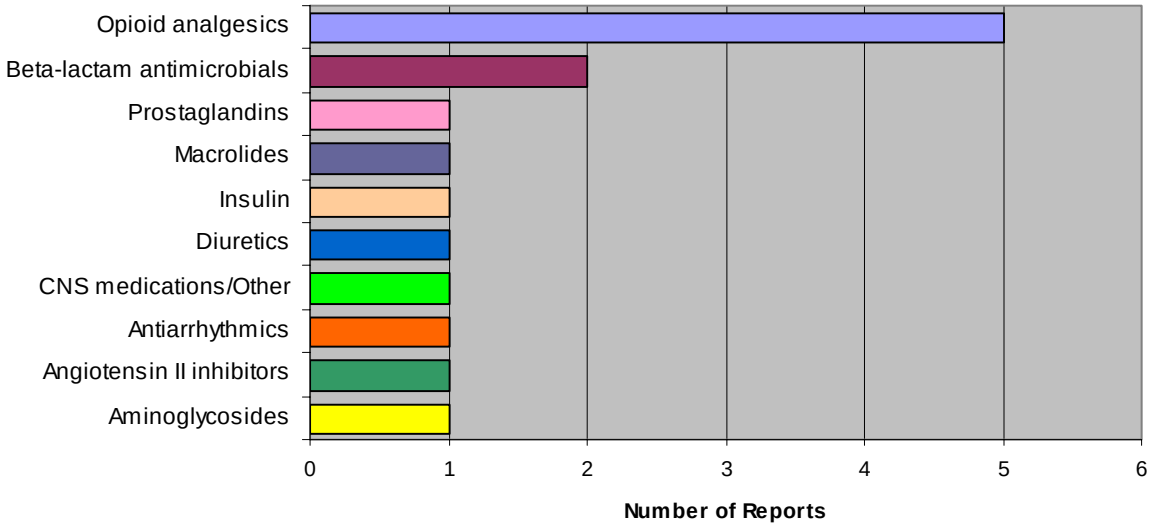


Table 3. Top Generic-name Medications Reported, Categories A–B: Project Hospitals (n = 25), 2005

Product Name	# of times selected
Acetaminophen	41
Warfarin	35
Hydrocodone and acetaminophen	32
Furosemide	31
Cefazolin	25
Morphine sulfate	24
Levofloxacin	23
Promethazine	23
Potassium chloride	22
Sodium chloride 0.9%	22
Enoxaparin	19
Ibuprofen	19
Lorazepam	19
Azithromycin	18
Ceftriaxone	17
Dextrose 5% in water and sodium chloride 0.45% and potassium chloride 20 mEq/L	16

Table 4. Top Generic-name Medications Reported, Category C: Project Hospitals (n = 25), 2005

Product Name	# of times selected
Hydrocodone and acetaminophen	47
Furosemide	41
Albuterol	40
Cefazolin	37
Potassium chloride	37
Enoxaparin	29
Levofloxacin	29
Acetaminophen	27
Warfarin	27
Ceftriaxone	26
Methylprednisolone sodium succinate	24
Lorazepam	21
Fentanyl	20
Ampicillin and sulbactam	19
Sodium chloride 0.9%	19
Morphine sulfate	18
Docusate sodium	17
Vancomycin	17
Oxycodone	17

Table 5. Top Generic-name Medications Reported, Category D: Project Hospitals (n = 25), 2005

Product Name	# of times selected
Warfarin	10
Insulin, regular, human	8
Metformin	6
Amino acids with electrolytes	4
Enoxaparin	4
Vancomycin	4
Ferrous sulfate	3
Gabapentin	3
Potassium chloride	3
Promethazine	3
Levothyroxine	3

Table 6. Top Generic-name Medications Reported, Categories E–I: Project Hospitals (n = 25), 2005

Product Name	# of times selected
Amiodarone	1
Ampicillin and sulbactam	1
Azithromycin	1
Carboprost	1
Fentanyl	1
Furosemide	1
Galantamine	1
Hydrocodone and acetaminophen	1
Insulin, regular, human	1
Losartan	1
Memantine	1
Morphine sulfate	1
Morphine sulfate, preservative-free	1
Oxycodone and acetaminophen	1
Ticarcillin and clavulanate	1
Tobramycin sulfate	1

Harmful Errors Reported by Project Hospitals

Much can be learned by reviewing the circumstances surrounding both individual and aggregated error reports. Tables 7 and 8 provide the error severity, description, type, causes, contributing factors, generic drug name, result on level of patient care, and actions taken of the 13 harmful medication errors (9 Category E and 4 Category F) reported by project hospitals in 2005. *No 24-hour pharmacy* was cited as a contributing factor in four of these errors. *Prescribing drugs to which patients were allergic* was the cause of two of these harmful errors. *Improper dosing of opioids* caused two errors. *Use of BID and QD abbreviations* contributed to another error. Share these stories with your staff and ask, "Could this happen here?"

Table 7. Detailed Error Reports, Category E: Project Hospitals (n = 9 reports), 2005[a]

Error Type	Cause of Error	Contributing Factor	Generic Name	Error Result on Level of Patient Care	Actions Taken w/Detail
Report 1					
Error Description: Azithromycin mixed by RN in 100 mL normal saline solution instead of 250 to 500 mL of normal saline solution. Infusing when patient complained of burning. RN realized problem, applied ice to site, but most of drug already infused.					
Drug prepared incorrectly	Knowledge deficit; System safeguard(s); Communication	No 24-hour pharmacy	Azithromycin	Observation initiated/increased	Informed staff who was also involved in error. Detail: Always double check medication before administration. RPH RN/LPN; RN/RN; LPN/RN etc.
Report 2					
Error Description: Acetaminophen and oxycodone originally ordered as 1-2 every 3 hours as needed, changed to every 4-6 hours as needed (night use only). Order was for acetaminophen and hydrocodone to be used during the day. Patient takes acetaminophen and oxycodone at home on a every 4 hours as needed basis, but only one at a time. When visited with patient, patient does not remember days, visits, etc., and that is what led to patient falling.					
Improper dose/ quantity	Documentation; System safeguard(s); Communication	A contributing factor not determined	Acetaminophen and oxycodone	A level of care not determined	Communication process enhanced. Detail: Stitches given after fall.
Report 3					
Error Description: Reported at change of shift that patient's saturation of oxygen occasionally drops. Increases to >90% with deep breaths when reminded. On exam, patient breathes shallowly but does deep breathe and cough on command. Patient too sleepy to maintain deep regular respiration on her own. Checked patient-controlled anesthesia pump settings; noted continuous infusion at 2 mg/hr; last order read "decrease to 1 mg/hr." Rate decreased to 1 mg/hr. Frequent reminders to patient to deep breathe and cough. Continued saturation of oxygen monitoring required.					
Improper dose/ quantity	Knowledge deficit; Performance (human) deficit; Transcription inaccurate/omitted; Monitoring inadequate/lacking	Staff, inexperienced; Distractions	Morphine Sulfate, Preservative-free	Observation initiated/increased; Oxygen administered; Drug therapy initiated/changed	Education/Training provided; Communication process enhanced
Report 4					
Error Description: Surgeon wrote to continue medications per primary provider order. RN who took off orders orally communicated it to the next shift, but it was not communicated on. Error discovered when reviewing preoperative physical, what medications the patient had been on before surgery.					
Omission error	Reconciliation-transition; Blanket orders; Procedure/protocol not followed; Communication	Workload increase	Losartan; Amiodarone; Memantine; Galantamine	Observation initiated/increased; Drug therapy initiated/changed	Informed patient's physician; Informed patient/caregiver of medication error; Communication process enhanced

Table 7. (Continued) Detailed Error Reports, Category E: Project Hospitals (n = 9 reports), 2005

Report 5					
Error Description: Patient complaining of increased pain, so chart was reviewed, and patient was due for duragesic patch change two days prior. Patch was not transferred to new medication administration record.					
Error Type	**Cause of Error**	**Contributing Factor**	**Generic Name**	**Error Result on Level of Patient Care**	**Actions Taken w/Detail**
Omission error	Medication administration record variance	No 24-hour pharmacy	Fentanyl	A level of care not determined	Informed staff who made the initial error. Detail: We need to insure that when the medication administration records are recopied they are double checked by the nurse that is caring for the patient.
Report 6					
Error Description: Patient on low dose sliding scale-Novolin Insulin 0700 BS 204 - insulin not given. 1100 BS384					
Error Type	**Cause of Error**	**Contributing Factor**	**Generic Name**	**Error Result on Level of Patient Care**	**Actions Taken w/Detail**
Omission error	Communication	Distractions	Insulin, Regular, Human	Drug therapy initiated/changed	Communication process enhanced
Report 7					
Error Description: Ampicillin and sulbactam 3 grams ordered every 8 hours but gave med even when patient was allergic to it					
Error Type	**Cause of Error**	**Contributing Factor**	**Generic Name**	**Error Result on Level of Patient Care**	**Actions Taken w/Detail**
Prescribing error	Contraindicated, drug allergy	Distractions; No 24-hour pharmacy	Ampicillin and Sulbactam	Antidote administered	Informed staff who made the initial error
Report 8					
Error Description: Patient stated earlier in the day morphine made her itch. Patient was given diphenhydramine one time. Afternoon RN gave morphine 4 mg intravenously that was ordered for pain, patient started to itch.					
Error Type	**Cause of Error**	**Contributing Factor**	**Generic Name**	**Error Result on Level of Patient Care**	**Actions Taken w/Detail**
Prescribing error	Contraindicated, drug allergy	Distractions; Workload increase	Morphine Sulfate	Drug therapy initiated/changed	Informed staff who was also involved in error; Informed patient's physician; Informed patient/caregiver of medication error; Communication process enhanced. Detail: Enforce policies, make sure patients communicate all allergies prior to procedures
Report 9					
Error Description: Carboprost needed in operating room. Medication usually stocked in refrigerator; none there. Called acute care; none there. House was called for medication; it was received and taken to operating room. Medication may not have been checked out of automated dispensing device, causing pharmacy not to know to refill remote stock.					
Error Type	**Cause of Error**	**Contributing Factor**	**Generic Name**	**Error Result on Level of Patient Care**	**Actions Taken w/Detail**
Wrong time	Dispensing device involved; Drug distribution system	A contributing factor not determined	Carboprost	Transferred to a higher level of care	Informed staff who was also involved in error; Policy/Procedure changed. Detail: Checking the stock weekly; informing the nursing staff the importance of checking things out

[a]Case descriptions modified for clarity.

Table 8. Detailed Error Reports, Category F: Project Hospitals (n = 4 reports), 2005[a]

Error Type	Cause of Error	Contributing Factor	Generic Name	Error Result on Level of Patient Care	Actions Taken w/Detail
Report 1					
Error Description: Hydrocodone and acetaminophen 1 by mouth given at 0530, followed by hydrocodone and acetaminophen 1 at 0630. D/C orders received. Noted increased lethargy. RN placed oxygen saturation monitor and observation for patient. Delay in d/c related to lethargy from pain meds.					
Extra dose	Knowledge deficit	Staff, inexperienced	Hydrocodone and Acetaminophen	A level of care not determined	Education/Training provided. Detail: Education on pain med - case study at staff meeting
Report 2					
Error Description: Patient dismissed from our facility. Dismissal order for "furosemide 40 mg bid"; RN writing out dismissal instructions wrote "furosemide 40 mg qd." Patient taking furosemide as instructed (once a day). Four days after dismissal, patient in emergency room with fluid overload, shortness of breath, and other symptoms associated with fluid overload. Patient readmitted and diuresed.					
Improper dose/ quantity	Transcription inaccurate/omitted, Abbreviations	No 24-hour pharmacy	Furosemide	Hospitalization, initial	Informed staff who made the initial error
Report 3					
Error Description: Tobramycin inhalation tx, 300mg. Nurses had to calculate dose to use 7.5cc per dose to get 300 mg vials came as 2ml with 40 mg / ml. Many doses where given with just one vial or inaccurate dose.					
Improper dose/ quantity	Calculation error	A contributing factor not determined	Tobramycin Sulfate	A level of care not determined	Education/Training provided. Detail: Medication pass observations to be implemented to assess use of 7 rights with medication administration and ant system failures that allow the rights to not be utilized.
Report 4					
Error Description: Timertin hung, mixed, not infused.					
Omission error	Pump, improper use	Distractions	Ticarcillin and Clavulanate	A level of care not determined	Communication process enhanced. Detail: Doctor informed with order to start 06AM dose now (0900) and stagger next dose.

[a]Case descriptions modified for clarity.

References

[1] Leonard, M., et al. (2004). *Achieving safe and reliable healthcare: Strategies and solutions.* Chicago: Health Administration Press.

[2] Marx, D. (April 14, 2004). *Errors: A balance between learning and accountability.* Presented to the Michigan Health and Safety Coalition.

[3] Santell, J. P., Hicks, R. W., & Cousins, D. D. (2005). *MEDMARX data report: A chartbook of 2000-2004 findings from intensive care units and radiological services.* Rockville, MD: U.S. Pharmacopeia Center for the Advancement of Patient Safety.

[4] U.S. Pharmacopeia. (2005). Unpublished data.