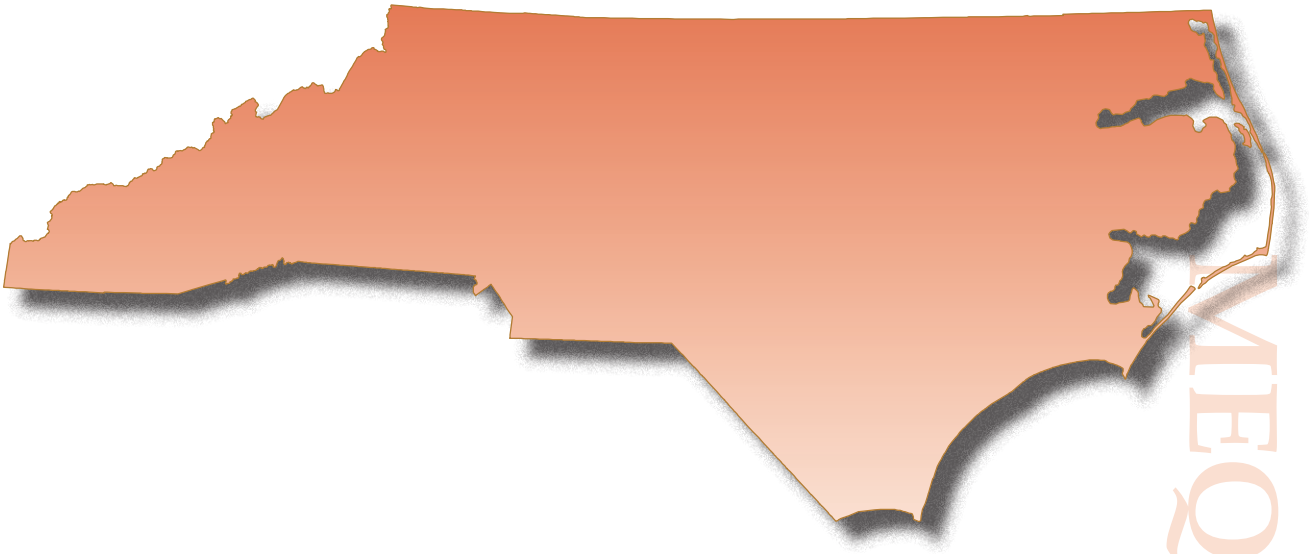
Nursing Home Medication Error Quality Initiative

MEQI Report: Year 3

October 1, 2005 to September 30, 2006



A report on the third year of mandatory summary reporting of medication errors and potential errors for all state licensed nursing homes in the State of North Carolina.

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MEQI Overview

The Medication Error Quality Initiative (MEQI) project has now collected a third year of medication errors reported in nursing homes in the State of North Carolina. Nursing homes licensed by the State of North Carolina are required by law (Senate Bill 1016) to report all medication errors and potential errors. Data have been successfully submitted for 100% of open and functional facilities during this time. For the first three years sites have utilized an online annual summary reporting format, submitting summary data for one year at a time – this system is now referred to as ***MEQI-Annual Report*** or ***MEQI-AR***. During the last reporting year access to an improved interactive online individual incident reporting system was provided to a limited number of sites – this system is referred to as ***MEQI-Individual Error*** or ***MEQI-IE***. MEQI-IE provides greater functionality and access to data for the nursing home staff, and provides more detailed and useful data for the MEQI project. Following the success of a MEQI-IE pilot study, all nursing homes in the State have been offered the opportunity to sign up for the improved system. As of January 1, 2007, 145 of 393 sites (36%) are enrolled, while 248 sites (64%) plan to use MEQI-AR for the next reporting year.

MEQI

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This report is the third in a series produced by: The Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill and the North Carolina Department of Health and Human Services.

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MEQI AR Data Results

The MEQI-AR Year 3 data are strikingly similar to Year 2 data (the first full year of data). The average number of errors per site was 41.4 in Year 2 and 41.5 in Year 3. The median number of errors per site in both Year 2 and Year 3 was 22. Even within categories there is very little change from year to year overall, though individual sites do not necessarily report the same number of errors, or types of errors, each year. (Table 1)

Table 1: MEQI-AR: Year 3 Totals

Total Number of Errors and Potential Errors Year 3	15,145*
Number of Errors Resulting in Harm to Patient (Category D.- H.)	96
Number of Sites Using MEQI-AR In Year 3	367
Exempt Sites: Closed temporarily	3
Mean number of errors per site	41
Median number of errors per site	22
Number of Reported Liability Claims	0

* To put the 15,145 errors and potential errors in context with respect to the opportunities, we estimate the following: The average nursing home resident receives 8.1 medications administered 2.2 times per day or 17.8 administrations total per day. (Tobias, Sey, Unpublished 2003) There are approximately 44,000 nursing home beds in the 367 submitting homes; this translates to approximately 783,200 administrations of medication per day in the reporting homes. Our data show an average of 41.4 MEQI errors reported statewide per day, which is a very small percent (only 0.005%) of medication administration opportunities. The Gurwitz study estimates an incidence of 120 adverse drug events per year in an average facility of 105 beds, which is 3.5 times the number of errors found in the NC reporting.(Gurwitz, Am J. Med, 2005)

In the patient impact category, most errors continue to be reported in the less serious categories; 94% of errors either *did not reach* or *did not harm the patient*. In Year 3, zero errors were reported in category F. *Contributed to Permanent Harm*, compared to 6 errors reported in year 2. There were 2 errors reported in the category G. *Intervention Necessary to Sustain Life*, and this is the first year there has been a report in this more serious category. (Table 2, next page)

There is very little change in the cause of error over the last two years. Most errors (91%) continue to be reported as caused by human factors (basic human error, simple mistake, forgot, orders overlooked, carelessness, oversight) or communication (verbal, written or other types of communication that are confusing, lacking or intimidating). The rise in human factor errors from Year 1 to 2 was probably the result of a definitional/glossary change that clarified the

MEQI-AR Data Results

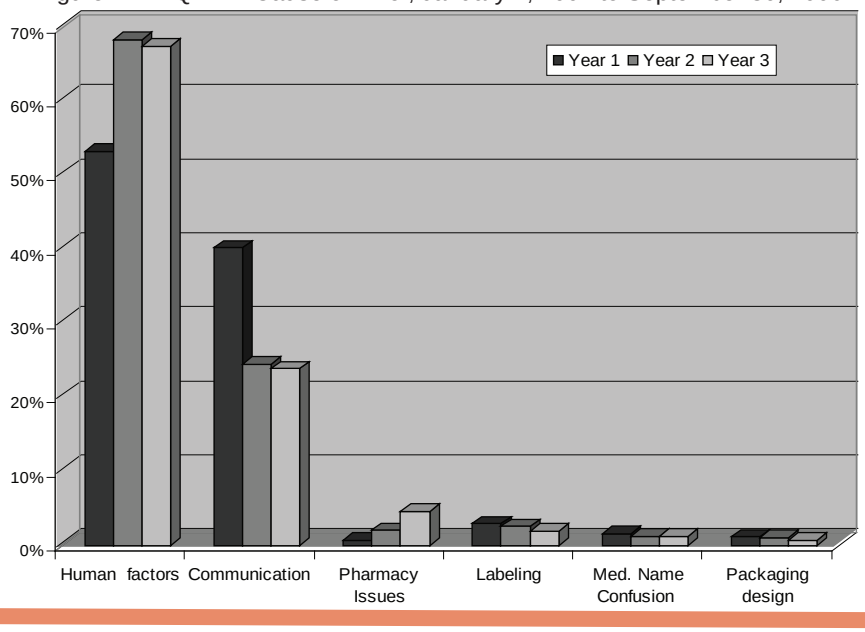
Table 2: MEQI-AR: Patient Impact, January 1, 2004 to September 30, 2006

Error Outcome	Year1#	Year1 %	Year2 #	Year2 %	Year3 #	Year3%
A. Did not reach the patient	1881	17.20%	2351	14.60%	2675	17.66%
B. Did not harm the patient	8070	73.90%	12061	74.90%	11517	76.04%
C. Required Monitoring / Intervention to Preclude Harm	886	8.10%	1437	8.90%	857	5.66%
D. Contributed temporary harm	59	0.50%	75	0.50%	71	0.47%
E. Temporary harm, required Emergency Department	23	0.20%	176*	1.10%	23	0.15%
F. Contributed to permanent harm	1	0.00%	6	0.00%	0	0.00%
G. Intervention necessary to sustain life	0	0.00%	0	0.00%	2	0.01%
H. Contributed to patient's death	0	0.00%	0	0.00%	0	0.00%

** Further examination of the Year 2 data indicates that 152 of the errors in this category were reported by just 2 sites (reporting 62 and 90 errors in this category), with all other sites reporting 24 errors. This is most likely data entry error or indicates an error that was repeated multiple times.*

human factors variable. The only noticeable change from Year 2 to 3 is in the area of pharmacy related errors. The definition of pharmacy issues was changed in response to nursing home requests in Year 2 to include a more broad range of pharmacy errors including: pharmacy did not deliver medication, pharmacy delivered medication to wrong facility, pharmacy was unavailable, pharmacy delivered wrong medication, and this has led to a

Figure 1: MEQI-AR: Cause of Error, January 1, 2004 to September 30, 2006



MEQI-AR Data Results

broader use of this category. This does not necessarily indicate more errors in this category, but a better understanding of the reporting variables. (Figure 1, page 4)

Over 53% of all errors are reported in the "dose omission" category. Other dosage errors (overdose, under dose, wrong dosage or extra dosage) account for an additional 21% of errors, making three-fourths of all errors dosage related. Wrong drug accounts for almost 6% of errors. (Figure 2)

Figure 3 shows the reported errors by phase over the three year period, which shows very little change over time. Figure 4 provides percentages of the personnel involved in error, again with limited change. Figure 5 (next page) shows the causal factors that were identified in the medication error process.

Figure 6 (next page) shows another increase this year in the number of residents involved in error who were reported to be able to direct their own care. The definition provided to the nursing home includes those who are not

Figure 2: MEQI-AR: Type of Error, January 1, 2004 to September 30, 2006

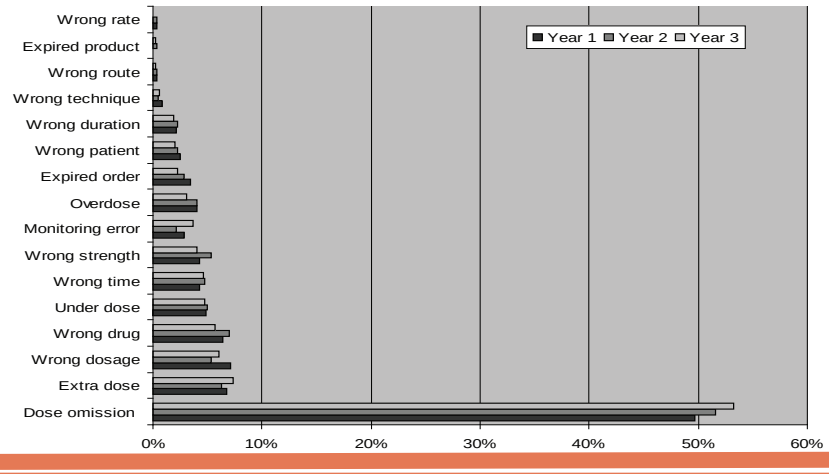


Figure 3: MEQI-AR: Phase of Error, January 1, 2004 to September 30, 2006

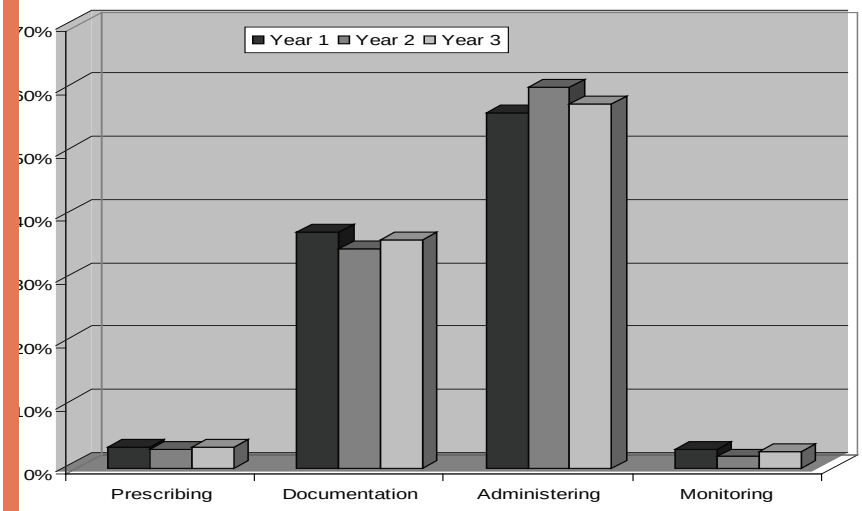
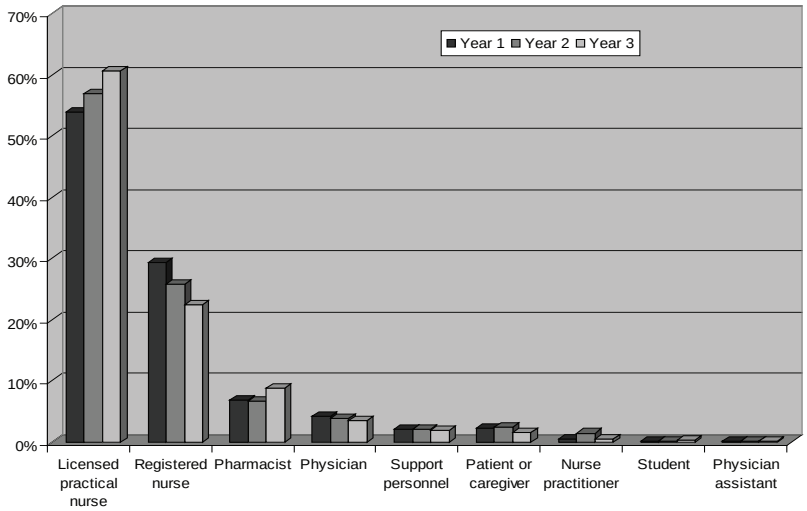
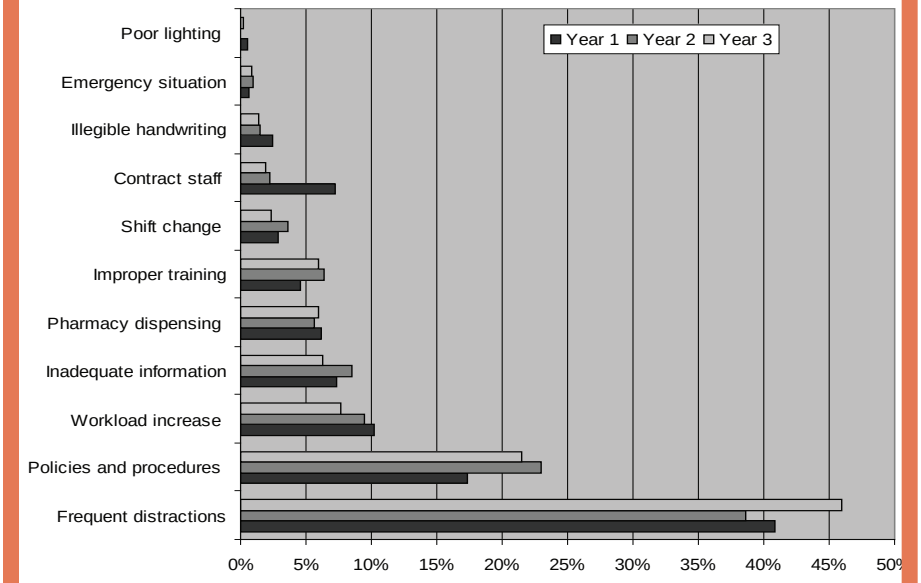


Figure 4: MEQI-AR: Personnel Involved in Error, January 1, 2004 to September 30, 2006



MEQI-AR Data Results

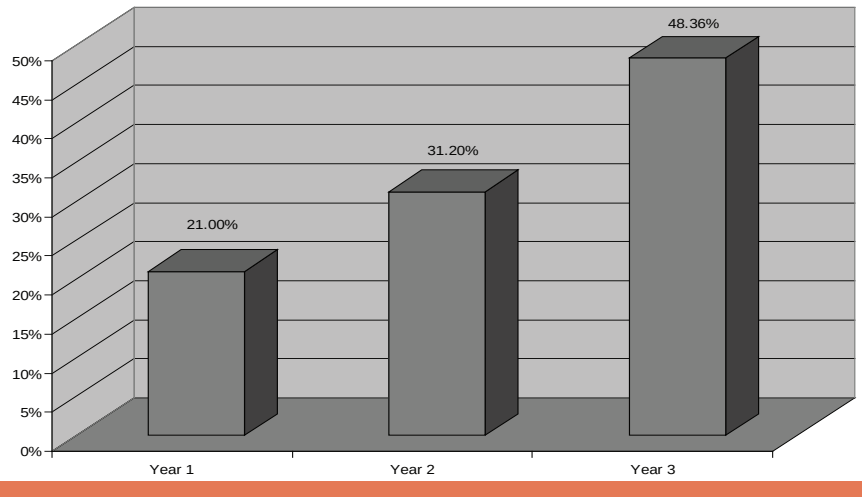
Figure 5: MEQI-AR: Causal Factors, January 1, 2004 to September 30, 2006



demented, comatose, or seriously vision or hearing impaired. This proportion has increased from 21% the first year, to 31% the second year when we clarified the definition, to a high of 48% in the third year. We do not know whether this change represents a shift in population or a shift in how nurses are interpreting this definition. (Figure 6, below)

See Appendix A for Additional MEQI-AR Results

Figure 6: Errors among Residents Able to Direct Own Care, January 1, 2004 to September 30, 2006



MEQI AR: Medications

Table 3 compares the most frequent medications reported in Years 2 and 3. The first column for each year shows the number of sites who reported at least one error with this medication. The second column shows the percentage of all sites who had an error with this drug and the third column shows the number of reported error incidents with this medication. Over time the same seven drugs top the list of medications, though the order changes: WARFARIN, LORAZEPAM, INSULIN (all types), HYDROCODONE (and combinations), OXYCODONE (and combinations), FUROSEMIDE and FENTANYL, all of which are potent drugs which can cause extreme harm in error situations. These seven drugs account for 17% of all the errors reported in MEQI-AR during Year 3.

MEQI-AR Data Results

All of these drugs have at least one error in 25% of the nursing homes submitting reports, and some as high as 42-43%. (Table 3)

During Year 3 there was a reduction in the percentage of sites reporting a WARFARIN error from 52% of reporting sites to 42% of reporting sites, resulting in a decrease in WARFARIN errors from 621 to 484. There was also a noticeable reduction in the number of LORAZEPAM errors reported from 828 in Year 2 to 477 in Year 3, though the percentage of sites reporting a LORAZEPAM error remained the same at 43%.

Table 3: MEQI-AR: Medications Involved In Error over Two Years*

Generic Name	Yr3 - # sites	% of 367 total sites	# errors reported	YR2 - # sites	% of 389 total sites	# errors reported
WARFARIN	153	42%	484	203	52%	621
LORAZEPAM	158	43%	477	166	43%	828
INSULIN	139	38%	473	106	27%	446
HYDROCODONE (and combinations)	110	30%	363	109	28%	376
OXYCODONE (and combinations)	125	34%	320	87	22%	308
FUROSEMIDE	93	25%	320	90	23%	213
FENTANYL	98	27%	245	90	23%	269
QUETIAPINE	36	10%	233	35	9%	59
LANSOPRAZOLE	17	5%	194	13	3%	32
ALPRAZOLAM	74	20%	191	81	21%	195
CLONAZEPAM	45	12%	173	66	17%	128
CALCIUM & VIT D	10	3%	157	16	4%	111
ACETAMINOPHEN	27	7%	116	25	6%	75
ZOLPIDEM	59	16%	113	55	14%	95
POTASSIUM SUPPLEMENTS	41	11%	111	47	12%	121
RISPERIDONE	34	9%	111	23	6%	50
DIGOXIN	34	9%	105	32	8%	65
LEVOTHYROXINE	30	8%	101	36	9%	79
CLONIDINE	35	10%	94	21	5%	82

** MEQI-AR only requires sites to list ten medications used in error and how many times that medication was found in an error. If a site submits more than ten errors they are asked to list the medications most frequently found in error, or the medications from the most serious errors.*

MEQI-IE Pilot Results

**MEQI-IE Pilot Study Results are not directly comparable to MEQI-AR results as variables have been changed. This year's MEQI –IE data are from 23 sites who reported for a full year.*

MEQI-IE is a newly designed and tested web-based tool for reporting medication errors. This tool includes a drug look-up capability developed using the FDA.gov medication listing and listings of nutritional supplement, vitamins and over the counter medications based on previous medication error submissions in NC. MEQI-IE allows sites to enter errors as they occur, access their own data by printing reports, and edit or finish previously entered errors. This system removes the need for unwieldy summarizing and searching for paper copies of errors at the end of the year. In conjunction with an active medication management advisory committee, the system gives nursing homes the ability to process, assess and learn from their errors during the year.

A pilot study was conducted with 23 volunteer pilot sites, who overall closely matched overall the demographics of the nursing homes in the state of NC. Errors that occur multiple times are noted in each error report, and are included here as *repeat* errors. A repeat error is when the exact same error happens multiple times to the same patient for the same reason (example: dosage was not changed in chart, therefore, the patient gets wrong dosage 5 days in a row before error is noted). Thirty-five percent of all the errors reported in MEQI-IE were repeated at least one time. In comparison, sites using MEQI-AR were requested to report each error only once, no matter how often it was repeated. However, data and discussions with nursing home staff indicate that some sites include repeat errors as separate error occurrences, primarily when they have existing data systems for recording errors for other entities. (Table 4)

Table 4: Year 3 Totals: MEQI-IE Pilot Study, October 1, 2005 to September 30, 2006

Total Number of Errors and Potential Errors Year 3	631
Number of Errors resulting in harm to patient (category 5-9)	5
Total Number of Repeat Errors (includes the total number of times an error was repeated)	2616
Number of Sites Using MEQI-IE In Year 3	23
Average errors per site	27
Average errors weighted by "repeat" errors	114
Number of Liability Claims	0

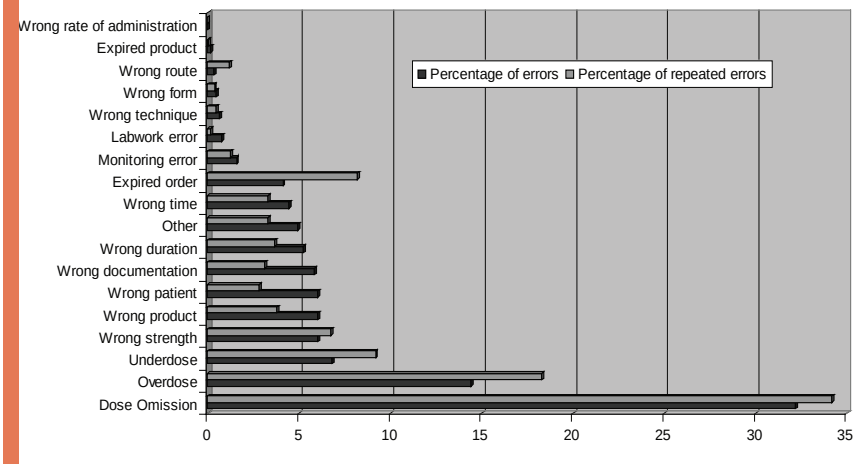
MEQI-IE Pilot Results

Reports on patient outcome for MEQI-IE show a similar high number of errors in the less serious outcomes (Impact group 1 to 3) as MEQI-AR with 92% of errors having the capacity to cause errors, not reaching the patient, or not causing harm to the patient. About 8% of errors fell into the more serious impact categories (4 to 9), with most of these (7.3%) requiring monitoring or intervention to preclude harm. Only 5 errors or 0.7% resulted in harm to the patient. (Table 5)

Table 5: MEQI-IE Pilot: Patient Outcomes for 23 Sites, October 1, 2005 to September 30, 2006

Error Outcome	Error	Percent Error	Repeat Error	Repeat Percent
Impact Group 1 to 3	580	91.9	2507	91.8
Impact Group 4 to 9	51	8.1	224	8.2
1=Capacity to Cause Error	16	2.5	87	3.2
2=Did not reach patient	64	10.1	109	4.0
3=Did not harm patient	500	79.2	2311	84.6
4=Required monitoring / intervention to preclude harm	46	7.3	217	8.0
5=Temporary harm	2	0.3	2	0.1
6=Temporary harm / needed ER	1	0.2	3	0.1
7=Permanent patient harm	0	0.0	0	0.0
8=Intervention necessary to sustain life	2	0.3	2	0.1
9=Patient death	0	0.0	0	0.0

Figure 7: MEQI-IE: Percentage of Types of Error for 23 Pilot Sites



In Figure 7 the data demonstrate that the types of errors most likely to be repeated are expired order, wrong strength, under dose, overdose and dose omission. Dose Omission still accounts for most errors, though this percentage is lower than the MEQI-AR results, a reduction of 53% to 32% of errors. This difference is most likely due to the fact that some sites using MEQI-

MEQI-IE Pilot Results

AR report each repeat error separately, and some report the error only once. MEQI-IE submissions include data on whether the error was repeated and the number of times repeated. Consequently each error is only reported one time.

During the first two years of the MEQI project input from nursing homes was sought on the data collection form. One of the main complaints about the form was the confusion between the "Possible Causes" and the "Contributing Factors". For MEQI-IE the two sections were combined into one larger section. (Table 6, below)

Table 6: MEQI-IE Possible Causes for 23 Pilot Sites, October 1, 2005 to September 30, 2006

Cause of Error	# error	% repeat	# repeat	% repeats
Basic human error	402	47.63	1469	39.83
Transcription error	152	18.01	996	27.01
Distractions on floor	72	8.53	207	5.61
Poor Communication	34	4.03	110	2.98
Other cause	30	3.55	169	4.58
Pharmacy dispensing	24	2.84	34	0.92
Name confusion	18	2.13	109	2.96
Pharmacy delivered wrong med	17	2.01	88	2.39
Package design	15	1.78	109	2.96
Product label	13	1.54	173	4.69
Too much workload/overtime	13	1.54	13	0.35
Shift change	11	1.3	33	0.89
Following policies	10	1.18	50	1.36
Med unavailable	10	1.18	64	1.74
Inadequate info	8	0.95	27	0.73
Improper training	6	0.71	16	0.43
Emergency on floor	3	0.36	3	0.08
Handwriting	3	0.36	6	0.16
Working conditions	2	0.24	4	0.11
Pharmacy closed	1	0.12	8	0.22
All Errors* (*more than one cause can be selected)	**844**	**100**	**3688**	**100**

MEQI-IE Pilot Results

MEQI-IE Medications

With the MEQI-IE system each error is reported seperately, so the data collected includes a medication for each type of error. In cases where a wrong drug was given, two types of medications are reported, what was administered, and what was supposed to have been administered. Given this, it was expected that the medication list might look different from that of MEQI-AR. However for this first year of data, with the limited number of sites, the same seven medications were the most frequent on both the MEQI AR and MEQI-IE list. (Table 7)

Table 7 MEQI-IE: Top 20 Medications for 23 Pilot Sites: Actual Drug Given or Involved in Error, October 1, 2005 to September 30, 2006

Active Ingredient	number of errors	repeat error occurrence
LORAZEPAM	40	131
OXYCODONE (and combinations)	29	165
WARFARIN	25	95
FUROSEMIDE	21	43
HYDROCODONE (and combinations)	21	29
INSULIN	20	75
FENTANYL	19	20
LIDOCAINE	15	20
ALPRAZOLAM	11	17
DIGOXIN	8	87
POTASSIUM	8	25
NITROGLYCERIN	8	17
ZOLPIDEM	8	17
ACETAMINOPHEN	8	11
AMOXICILLIN	7	45
CIPROFLOXACIN	7	15
MORPHINE	7	11
METOPROLOL	7	7
CLOPIDOGREL	6	75
DONEPEZIL	6	40

The MEQI-IE data are provided on an individual error basis so we can look at each individual error or find out what causes more serious errors. As more sites start using MEQI-IE we will have more specific information on what types of errors or medications lead to the most serious outcomes and will provide these updates to nursing homes during the year.

See Appendix B for Additional MEQI-IE Results

Nursing Home Notes

The following are four areas we have noted in the MEQI-IE pilot data.

Watch out for Look-alike – Sound-alike Product Names

Watch out for Look-alike or Sound-alike product names. This can be the cause of many wrong product errors. The following table shows medication errors found in NC nursing homes just this year. Some of these errors were found repeatedly. Many of the errors we found in this category were confusion over the benzodiazepines, which often have similar sounds, *az* in the middle and *am* or *pam* at the end. (Table 8)

Table 8: MEQI-IE Pilot: Examples of Look-alike, Sound-alike Products

LOR**AZEPAM**	CLON**AZEPAM**
LOR**AZEPAM**	DI**AZEPAM**
LO**RAZ**EP**AM**	ALP**RAZ**OL**AM**
ACETAMINOPHEN	**ACETAMINOPHEN**
HYDROCODONE BITARTRATE	OXYC**ODONE HYDRO**CHLORIDE
SULFADIA**ZINE**	**SULFA**SAL**AZINE**
LOVENOX	**LOV**ASTATIN
FORTICA**L**	**FOR**ADI**L**
CLONAZEPAM	**CLON**IDINE

If your site has a medication error leading to an adverse event that results from product confusion based on name or labeling, we recommend that in addition to recording this error for MEQI, you submit a voluntary reporting form at the FDA to report this error.

http://www.fda.gov/medwatch/report/hcp.htm

"Thank you for visiting the MedWatch website to voluntarily report a serious adverse event, product quality problem or product use error that you suspect is associated with the use of an FDA-regulated drug, biologic, medical device or dietary supplement.

In order to keep effective drugs and devices available on the market for use by you and your patients, the FDA relies on the voluntary reporting of these events. FDA uses this data to maintain our safety surveillance of all FDA-regulated products. Your report may be the critical action that prompts a modification in use or design of the product, improves the safety profile of the drug or device and leads to increased patient safety. "

Nursing Home Notes

Warfarin
Lorazepam (and other similar medications such as clonazepam, aprazolam and ambien)
Furosemide
Insulin
Hydrocodone (and combinations)
Oxycodone (and combinations
Fentanyl

Know which Medications Are More Likely to Cause Errors and Provide Extra Training on Those Medications

The same medications cause the most errors year after year in NC nursing homes, and many are very dangerous. Benzodiazepines and sedative hypnotics appear to be particularly error prone and the there is a large amount of literature documenting that these are risky medications for the frail elderly. Nursing homes should be encouraged to pay special attention to these drugs that top our error lists and often cause serious harm. Many of these medications have similarities; complicated or PM dosing, high likelihood of frequent changes to dose, and often an order expiration date.

Focus Your Training on Reducing *Overdose* and *Wrong Patient* Errors and You Will Limit Many of the More Serious Errors

Overdose errors and *Wrong Patient* errors have a greater chance of more serious outcomes. If a nursing home wants to target certain kinds of errors for training, these would be the most appropriate. Nursing homes should post and implement policies that require all nurses to follow the *Five Rights*.

Right Patient
Right Drug
Right Dose
Right Route
Right Time

- Inadequate Information: Order was not clear as stated.
- Packaging Design: Package has similar font, color, size and design as another medication.
- Workload Issues and Overtime: Short term or permanent increase in staff workload directly contributed to error.
- Pharmacy Dispensing: Other dispensing issues, does not include pharmacy closed, pharmacy delivered wrong medication or medication delivered to wrong facility (which are counted in separate category).

Know What Causes the Errors with the Most Serious Outcomes

Certain types of error causes appear to lead to more serious outcomes. Training should take these into account.

Appendix A: MEQI AR, Additional Results

APPENDIX A: Additional MEQI-AR Results, October 1, 2005 to September 30, 2006

Time of Error	Number	Percent		
7:00 AM-2:59 PM	8056	53.19%		
3:00 PM-10:59 PM	5644	37.27%		
11:00 PM-6:59 AM	1445	9.54%		
Administration Actual Route			**Administration Intended Route**	
Intravenous-actual	93	0.61%	149	0.98%
Intramuscular-actual	127	0.84%	187	1.23%
Oral-actual	6635	43.81%	10827	71.49%
Subcutaneous-actual	430	2.84%	732	4.83%
Tube- actual	260	1.72%	416	2.75%
Topical-actual	520	3.43%	1121	7.40%
No Med -Actual	7080	46.75%	1255	8.29%
Age of Resident				
< 65 years	2224	14.68%		
65-70 years	1406	9.28%		
71-75 years	1895	12.51%		
76-80 years	2588	17.09%		
81-85 years	3281	21.66%		
86-90 years	2208	14.58%		
90+ years	1543	10.19%		
Gender of Resident				
Male	4711	31.11%		
Female	10434	68.89%		
	Number Response	**Percent Response**	**Percent of Error**	
Total Effects response	**15897**	**104.97%**	**100.00%**	
No injury occurred	14514	95.83%	91.30%	
Inadequate effect of product	966	6.38%	6.08%	
Change in blood sugar	90	0.59%	0.57%	
Somnolence	63	0.42%	0.40%	
Cognitive change	51	0.34%	0.32%	
Allergic Reaction	48	0.32%	0.30%	
Excessive side effects	43	0.28%	0.27%	
Fall	30	0.20%	0.19%	
Change in blood pressure-	20	0.13%	0.13%	
Constipation/diarrhea	20	0.13%	0.13%	
Nausea/vomiting	19	0.13%	0.12%	
Headache	9	0.06%	0.06%	
Edema	7	0.05%	0.04%	
Respiratory distress	6	0.04%	0.04%	
Gastrointestinal bleed	5	0.03%	0.03%	
Visual disturbance	5	0.03%	0.03%	
Aspiration	1	0.01%	0.01%	
Cardiac arrest	0	0.00%	0.00%	
Death	0	0.00%	0.00%	
Hearing disturbance	0	0.00%	0.00%	

Appendix B: MEQI IE Pilot, Additional Results

Appendix B: Additional MEQI-IE Results, October 1, 2005 to September 30, 2006

	# OF ERRORS	% ERRORS	# REPEATS	% REPEATS
Personnel: LPN	372	58.95	1301	47.64
Personnel: RN	136	21.55	529	19.37
Personnel: Support Personnel	70	11.09	740	27.1
Personnel: Pharmacist	37	5.86	112	4.1
Personnel: Medication Aide	8	1.27	8	0.29
Personnel: Physician	7	1.11	31	1.14
Personnel: Nurse Practitioner	1	0.16	10	0.37
Personnel: Physician Assistant, Patient or Caregiver and Student or Trainee all had 0 Errors				
Temporary/Contract Staff	26	4.12	80	2.93
Age Group 49 yrs or less	19	3.01	54	1.98
Age Group 50-59 yrs	16	2.54	142	5.2
Age Group 60-69 yrs	47	7.45	243	8.9
Age Group 70-79 yrs	154	24.41	543	19.88
Age Group 80-89 yrs	265	42	1113	40.75
Age Group 90-99 yrs	109	17.27	538	19.7
Age Group 100+ yrs	5	0.79	11	0.4
Male	153	24.25	843	30.87
Female	462	73.22	1801	65.95
Patient able to direct own care	228	36.13	905	33.14
Patient unable to direct own care	380	60.22	1719	62.94
01 - 05 meds daily	16	2.54	44	1.61
06 - 10 meds daily	59	9.35	185	6.77
11 - 15 meds daily	79	12.52	258	9.45
Shift Error Occurred: 7am to 3pm	345	54.68	1877	68.73
Shift Error Occurred: 3pm to 11pm	216	34.23	628	23
Shift Error Occurred: 11pm to 7am	70	11.09	226	8.28
Error Occurred in Transition	42	6.66	280	10.25
Transition from Home	3	0.48	31	1.14
Transition from Hospital	39	6.18	249	9.12
Error related to Medicare Part D	2	0.32	26	0.95
Effect: No injury or effect	556	87.01	2290	79.79
Effect: Inadequate effect	36	5.63	175	6.1
Effect: Change in blood pressure	10	1.56	13	0.45
Effect: Other effect	8	1.25	29	1.01
Effect: Change in blood sugar	6	0.94	54	1.88
Effect: Excessive side effects	6	0.94	101	3.52
Effect: Somnolence	5	0.78	49	1.71
Effect: Cognitive change	3	0.47	33	1.15
Effect: Nausea/Vomiting	3	0.47	3	0.1
Effect: Constipation/Diarrhea	2	0.31	89	3.1
Effect: Edema, Fall, Headache and Respiratory Distress each had one error.				

Medication Error Quality Initiative
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