

CALNOC: Understanding Medication Administration Processes and Outcomes

Presented, on behalf of the CALNOC Team
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Learning Objectives

- At the end of the session the participants will be able to :
- Describe the rationale for using observation as the best measure of medication administration accuracy.
 - Identify the role of the observer in CALNOC's nursing sensitive quality measure for medication administration accuracy.
 - Define what constitutes a medication administration safe practices and types of medication errors.
 - Describe CALNOC's methodology for collecting data on medication administration.



From CaINOC
to CALNOC



The Collaborative Alliance for Nursing Outcomes (CALNOC)



The First U.S. Nursing Quality Benchmarking Registry



CALNOC Vision



Leading the Global Quest for Patient Care Excellence



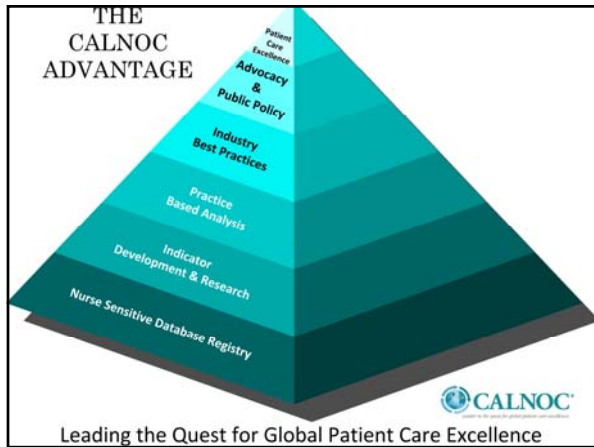
CALNOC Mission

Advance global patient care safety, outcomes and performance measurement efforts by:

- Leveraging a dynamic nursing outcomes database and reporting system
- Providing actionable data to guide decision making, performance improvement, and public policy
- Conducting research to optimize patient care excellence
- Building leadership expertise in the use of practice-based evidence









CALNOC Unit Level Data

Types of Units/Patient Populations

- **Adult Acute Care**
 - ✓ Critical Care
 - ✓ Step Down
 - ✓ Medical
 - ✓ Surgical
 - ✓ Medical/Surgical Combined
 - ✓ Observation >24 hr
- **Pediatrics**
- **Post Acute (SNF, Distinct Part)**
- **Acute Rehabilitation**

CALNOC Structural Measures

- Hours of nursing care per patient day
 - ✓ RN HPPD
 - ✓ LPN HPPD
 - ✓ UAP HPPD
- Skill Mix*
- % Contract Hours
- Ratios*
*calculated by CALNOC
- Voluntary Turnover Rate
- RN Characteristics
 - ✓ Education
 - ✓ Certification
 - ✓ Years of Experience
- Unit Rate of Admissions, Discharges and Transfers



CALNOC Process Measures

- **Falls & Hospital Acquired Pressure Ulcers**
 - ✓ Risk assessment
 - ✓ Time since last risk assessment
 - ✓ Risk Score (Pressure Ulcers)
 - ✓ Risk Status
 - ✓ Prevention protocols in place
- **Medication Administration Accuracy and Safe Practice Adherence**
- **PICC Line Insertion Practices** (who inserted, where, presence of a dedicated team)



CALNOC Outcome Measures

- Hospital Acquired Pressure Ulcer Rate by Stage
- Fall Rate & Injury Fall Rate
- Restraint Prevalence Rate
- Central Line-Associated Blood Stream Infections in PICC Lines
- **Medication Administration Error Rates and Nurse Safe Practice Frequencies**



The Magnitude of the Problem

MEDICATION SAFETY RESEARCH



Medication Errors Leape, et al Study

In 1995, Leape and his colleagues found that 56% of the adverse drug events they detected were due to prescription errors and 44% involved administration errors.



Leape, L.L., Bates, D.W., Cullen, D.J., et al. (1995). Systems analysis of adverse drug events. *JAMA*; 274: 35-43.



Medication Errors: Addressed in the Quality Chasm Series from the IOM

The 1999 Institute of Medicine Report on the quality of care--*To Err is Human: Building a Safer Health System*--brought national attention to the occurrence, clinical consequences, and costs of Adverse Drug Events (ADEs) (IOM, 1999)



IOM 2006 Medication Error Report



Preventing Medication Errors: July, 2006

- The study focused on the safe, effective, and appropriate use of medications
- The IOM study committee estimated a hospital patient is subjected to an average of at least one medication error per day, with considerable variation in error rates across facilities.



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Patients Continue to be at Risk

- A February 2008 study was conducted by Dr. David Bates, in six community hospitals in Massachusetts
- One of every ten patients admitted to the hospitals suffered serious and avoidable medication mistakes
- This study was conducted by chart review and in hospitals without computerized order entry



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Joint Commission Alert August 27, 2009

Leadership Critical to Preventing Medical Errors...Leaders must take responsibility for patient safety, such as:

- Institute an organization-wide policy of transparency that sheds light on all adverse events and patient safety issues, and
- Make the organization's overall safety performance a key, measureable part of the evaluation of the CEO and all leadership

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Medication Administration Accuracy



How Are Medication Errors BEST Discovered?

OBSERVATION!



Using Observational Research to Understand Medication Practices

- The pharmacy literature has strongly endorsed the direct observation technique as “the most effective method to quantify the administration errors” (Shane, 2009)
- Over 50 studies have used this method to understand medication practices.



Medication Errors : Using Observation from Barker,Pepper, et al

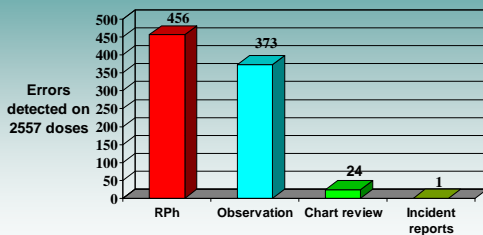
In a 2002 study of medication errors in 36 institutions, Barker and associates found that nearly one in five (19%) of the doses were in error. The following were the most frequent errors noted:

- Wrong time (43%)
- Omission (30%)
- Wrong dose (17%)
- Unauthorized drug (4%)

Barker, K.N, Flynn, E.A., Pepper, G.A., Bates, D.W., Mikeal, R.L. (2002) Arch Intern Med; 162: 1897-1903.



Comparison of Error Detection Methods



Barker, Flynn, Pepper, Bates, Mikeal (2002) AJHP.

CALNOC Medication Administration Accuracy Measure Strategic Aims

The CALNOC measure is intended to assist hospitals to:

1. Examine the extent to which staff perform priority safe practices during the process of preparing, administering and documenting the administration of medications.
2. Examine the prevalence of errors observed in the process of medication administration.
3. Benchmark their medication administration accuracy performance with their CALNOC peers to identify goals for performance improvement.



CALNOC Medication Administration Accuracy Measure Strategic Aims

4. Explore the impact of nurse staffing and workforce characteristics on the performance of safe practices and the accuracy of medication administration.
5. Gain new insights into factors that are universal and unique that impact medication preparation, administration, and documentation safe practices and errors in your setting.



Current Research on Nurses and Medication Safety

- There is more research about the complexity of medication preparation and administration
 - Topics include the amount of time required for nurses to perform medication related activities
 - Factors that may be barriers to safe medication practices, such as distractions and interruptions
 - The impact, both positive and negative, of technology

AHRQ Strategies to Reduce Errors:

- **Conduct a baseline evaluation:** Quantify and categorize distractions encountered by nurses administering medications.
- **Start with one nursing unit:** Gradually roll out to other units as they are ready.
- **Leadership support:** Ensure that registered nurses understand that the hospital is committed to the new solutions and will help them overcome any barriers that might slow the process down

<http://www.innovations.ahrq.gov/index.aspx>



The CALNOC Study Method: Observation & Error Review

Naïve observation methodology is a process whereby the observers do not know the actual medication order but observe the entire preparation and administration process.



Comparative record review is performed after observation is completed to determine number, type of errors and frequency of each type of medication error.

Overview of the CALNOC Medication Administration Accuracy Indicator and Methodology



Developing the CALNOC Measure

- In 2005-2006 with funding from Gordon and Betty Moore Foundation, CALNOC:
 - Conducted an environmental assessment to identify local and national experts
 - Identified measurement options, core literature and methodological challenges
 - Engaged Dr. Ginny Pepper RN, PhD, consultant
 - Convened practice experts to participate in indicator consensus development and coding development process

Developing the CALNOC Medication Administration Accuracy Indicator

- Developed preliminary coding specifications and pilot test methods for a systematic assessment of the new measure and methods
- Pilot tested the medication administration measure and refined the methods, coding and training
- Launched the new indicator July 2006



Medication Administration Accuracy Indicator Definitions

- Medication administration **error** is defined as a *dose administered differently than ordered on the patient's medical record.*
- Medication administration **accuracy** is operationally defined as *the prevalence of errors in medication administration in relation to the number of dose opportunities.*



CALNOC Measure--Observational Prevalence Approach, plus Medical Record Review

- Naïve observers systematically watch nurses prepare, administer and document medications—dose-by-dose; then review the Medical Record
- Naïve observers do not know the actual medication order
- 100 doses of medication administration are observed per unit per reporting period



Why Naïve Observation?

- Observation is more reliable than self-report, especially for automatic functions
- Decreases “confirmation bias”
- Decreases risk of altering the phenomenon
- Decreases the ethical dilemma



Safe Practices Observed as the Nurse Prepares and Administers Doses

- Compares medication with the MAR
- Explains medication to patient
- Medication labeled throughout process
- Checks two forms of ID
- Charts medication immediately after administration
- Frequency RN distracted or interrupted



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CALNOC Medication Administration Accuracy
Observation Codesheet
 (Do NOT send this form to CALNOC)
 Use this form to record observations. Data from this form MUST be entered in the
 CALNOC Medication Administration Excel Data Submission file and emailed to CALNOC. NO paper forms will be accepted.

User _____ Patient _____ Room # _____ Date/Time of Observation _____
(1 patient per line)

Patient Code _____ (Number patients sequentially) Age _____ Gender _____

Was the primary reason for hospitalization medical or surgical? (check one) Medical _____ Surgical _____ Clinician: RN _____ or LVN _____

Complete one line below for each dose. Start a new page for each new patient.

Date Number	Observer Notes (Record date and time of administration, drug, dose, route, and form)	Administration (Answer each item for each dose)	Error Complete after reconciliation (Check all that apply)
_____		1. Compare medication with MAR... (No) (Yes) (None) 2. Detection of interruption during preparation or administration... (No) (Yes) (Unidentified Drug) (Extra Dose) 3. Medication labeled throughout process from preparation to administration... (No) (Yes) (Wrong Dose) (Omission) 4. Checks 2 forms of ID... (No) (Yes) (Wrong Form) (Wrong Time) 5. Explain medication to patient (No) (Yes) (SA) 6. Check medication sequentially after administration... (No) (Yes) (At least one MUST be marked)	
_____		1. Compare medication with MAR... (No) (Yes) (None) 2. Detection of interruption during preparation or administration... (No) (Yes) (Unidentified Drug) (Extra Dose) 3. Medication labeled throughout process from preparation to administration... (No) (Yes) (Wrong Dose) (Omission) 4. Checks 2 forms of ID... (No) (Yes) (Wrong Form) (Wrong Time)	

Maximizing Use of the Observation Moment

- Observations will generate findings or insights that your facility will want to follow-up
- While that information will not be sent to CALNOC, you will want to review that information after the observation period
- Insights or comments related to infection control, device safety, and other practice related issues can assist in quality and performance improvement



From SF General Medpass Observation Tool

****Interruption Assessment (must be answered if question #3 is marked YES)**

Interruption Type (check all that apply):	Location/ Comments:	Self-Initiated	Urgent	Non-Urgent
<input type="checkbox"/> Non-productive talk in med room		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Phone Calls		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Nurse-to-nurse interaction		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other discipline-to-nurse interaction		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Patient/Family-to-nurse interaction		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments/Notes: _____

(If None, fill in MEDS, etc.) (If None, fill in patient, etc.)

- Unit PI groups were interested in collecting the types of interruptions observed – directs PI interventions
- Also included: self-initiated, urgent vs. non-urgent interruptions



CALNOC Medication Administration Accuracy -- Record Review

All original medication orders are compared with the medications that were observed being prepared and administered.



Doses Ordered and Doses Observed are Compared to Determine Types of Errors

- Unauthorized Drug
- Wrong Dose
- Wrong Form
- Wrong Route
- None
- Wrong Technique
- Extra Dose
- Omission
- Wrong Time
- Drug Not Available



CALNOC's Recommendation If a Systems Error is Discovered

If an error is discovered in record review and likely to be repeated if not acted upon, the observer alerts the patient's nurse.

CALNOC recommends that each hospital refer to institutional policies for guidance on reporting and follow through related to error discovery.



NOTE: FOR EACH OBSERVED DOSE, THERE ARE 6 ADMINISTRATION SAFE PRACTICE ENTRIES AND UP TO 10 POSSIBLE ADMINISTRATION ERRORS (NONE, OR THERE MAY BE MORE THAN ONE ERROR IN AN OBSERVED DOSE)



CALNOC's Preliminary Findings--2006-2009



CALNOC is Currently Preparing the First Publication of Findings

- Until those findings are published, we will not release data, but we are pleased to share some of our preliminary findings based on the first analysis



2008 CALNOC Conference Initial Descriptive Findings

- **At that time, 27 CalNOC hospitals** had submitted observation studies from **123 units** since July 2006
- Medication errors and a wide variation in safe practices was evident
- Additional research was indicated on the relationship between the nurse safe practices and the numbers and types of medication errors



Aims of this Exploratory Analysis

- To examine the frequency of medication practice errors and outcome errors at dose level and patient level (*not at usual unit or hospital levels*).
- To explore associations between the safe practices nurses use and their error rates.
- To identify safe practices with the strongest potential to improve medication administration safety.



CALNOC Sample

16,247 medication doses observed*

- **4,174** patients
- **85** units drawn from these hospitals
- **29** CALNOC hospitals

**Omission errors were excluded (186/16433) or 1.13% of the doses*



How Frequent Were Safe Practice Errors and Outcome Errors?

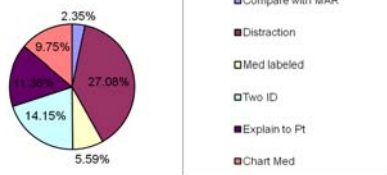


Safe Practice Error Rate Per Dose (n=16,247 doses)

Any Safe Practice Error

- 44.93% of doses administered had at least one of six safe practice error

% Practice Errors per Dose



Outcome Error Rates Per Dose (n=16,247 doses)

Any outcome error

- 8.55% of doses had at least one outcome error

% Outcome Errors per Dose



Safe Practice Error Rate Per Patient (n=4,174 patients)

• Any Safe Practice Error

- 52.9% of all patients experienced at least one practice error!



What safe practice errors were most common?

- The most frequent practice errors observed were:
 - 1) distraction and interruption (27.1%),
 - 2) check two forms of id (14.1%),
 - 3) explain medication to patient (11.4 %), and
 - 4) chart immediately (9.7%)



Are Safe Practices Really Associated with Fewer Medication Administration Outcome Errors?



YES!

- At the dose level, the two nurse safe practices errors with the highest correlation to overall outcome error (any error) were:
 - Chart medication immediately after (0.12) and
 - Dose labeled throughout process (0.11)
- Similar result at the patient level analysis



Key Findings Simply Stated

There is a statistically significant *direct* relationship between practice errors and outcome errors

- Fewer practice errors were associated with fewer outcome errors
- As fewer patients experience practice errors, fewer experience outcome errors



Bottom Line

- Are there safe practice errors among the data reported by CALNOC hospitals: YES
- Is there an association between safe practices and medication outcome error rates: YES



The Possible Impact of These Findings

- Consistent safe practices may lead to safer care and fewer errors
- This begins to isolate specific safe practices with the most impact on medication administration accuracy to focus quality efforts



CALNOC Next Steps

1. Continue to grow adoption of this indicator for benchmarking and performance improvement
2. Examine unit and facility level performance for benchmarking
3. Continue to examine the association between the safe practices and medication outcome errors
4. Explore the impact of unit level nurse staffing on medication administration accuracy
5. Expand collaboration with hospitals, pharmacists and nursing schools



www.calnoc.org