Naïve Observation Insights into Hospital Nursing Medication Administration Accuracy and Safety

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On Behalf of the CALNOC Team

Objectives

- Describe the CALNOC naïve observation methodology as a medication administration safety tool.
- Share hospital data from CALNOC hospitals using naïve observation to improve safety.
- Describe naïve observation research related to medication administration accuracy and safe practices.
- Panel discussion of hospital experiences with medication administration performance improvement measured with naïve observation.
  - University of California San Francisco
  - San Francisco General
**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

**Benchmark Reports...to Understand**

At a unit level within a hospital, at the hospital level (by unit type or total facility), or for entire health systems.

<table>
<thead>
<tr>
<th>Structural Measures</th>
<th>Process Measures</th>
<th>Outcome Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hours per Patient Day</td>
<td>• Risk Assessment for Falls, Pressure Ulcers, and Skin</td>
<td>• Fall Rates</td>
</tr>
<tr>
<td>• Skill Mix</td>
<td>• Protocol Implementation for Fall and Pressure Ulcer</td>
<td>• Injury Fall Rates</td>
</tr>
<tr>
<td>• Ratios of patients to licensed staff</td>
<td>Prevention</td>
<td>• Hospital Acquired Pressure Ulcers</td>
</tr>
<tr>
<td>• Use of Contract Staff</td>
<td>• Restraint Use</td>
<td>Prevalence</td>
</tr>
<tr>
<td>• Sitter Utilization</td>
<td>• Medication Safe Practices</td>
<td>• Medication Error Rates</td>
</tr>
<tr>
<td>• Nurse education, certification, and years of experience</td>
<td>• Patient/Bed Turnover</td>
<td>• PICC Line BSI Rates</td>
</tr>
<tr>
<td>• Staff voluntary turnover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Maternal/Child Deliveries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ED Encounters/Boarders</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### CALNOC Service Lines and Measure Sets*

<table>
<thead>
<tr>
<th>Care/Unit Type</th>
<th>Staffing/ Pt. Days/ HAPU 3+</th>
<th>Falls</th>
<th>Pressure Ulcer/ Restraint</th>
<th>Med Admin Studies</th>
<th>CABSI - PICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Acute Care</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ED</td>
<td>X (ED visits)*</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal/ Child</td>
<td>X (Deliveries)*</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Post Acute</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### Nurses are in the Forefront of Medication Safety

- Medication administration is mainly a nursing task that can consume up to 40% of clinical nurses’ work time (Armitage & Knapman, 2003).
- Nurses are responsible for 26%—38% of medication errors in hospitalized patients (Leape et al, 2002; Bates, 2007), and have an important role in ensuring safety in the medication administration process.
- The nurse is the last person who can check the medication is correctly prescribed and dispensed before it is administered (Davey et al, 2008).
Dual Roles of Nurses

“Nurses have dual roles: as the producers and as defenders against failure”

Julieann Morath, RN
Author: *To Do No Harm*

Administration as a Priority

- **23%** of errors intercepted (Transcription 11%)
- **37%** of errors intercepted (Dispensing 14%)
- **26%** of errors intercepted (Administration)
- **48%** of errors intercepted (Ordering 49%)

No errors intercepted!!!

How Many Rights are Right?

**Medication Administration is probably the highest risk task a nurse can perform!**

<table>
<thead>
<tr>
<th>5 Rights</th>
<th>7 Rights</th>
<th>9 Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient</td>
<td>Patient</td>
<td>Patient</td>
</tr>
<tr>
<td>Drug</td>
<td>Drug</td>
<td>Drug</td>
</tr>
<tr>
<td>Dose</td>
<td>Dose</td>
<td>Dose</td>
</tr>
<tr>
<td>Route</td>
<td>Route</td>
<td>Route</td>
</tr>
<tr>
<td>Time</td>
<td>Time</td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>Response</td>
<td>Response</td>
</tr>
<tr>
<td></td>
<td>Documentation</td>
<td>Documentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Action</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Form</td>
</tr>
</tbody>
</table>


The Healthcare Workplace

Nurses work in a healthcare workplace that is fast-paced and noisy:

- Equipment alarms
- Phone calls
- Nurse call-lights
- Pagers
- Questions from co-workers, physicians, patients, families
Interruptions in Medication Administration Well Documented

Sample of 102 medication administration rounds
- 374 interruptions were observed over 59 hours of medication administration (6.3/hr)
- **Conclusions**—Medication administration is not protected against interruptions, which poses significant risks.
- **Clinical Relevance**—Interventions to reduce interruptions during the medication administration process should target nurses and system failures to maximize medication administration safety.

_Biron, Lavoie-Tremblay, & Loiselle (2009). Work Interruptions During Medication Administration_
CALNOC Method

100 medication administration doses observed per unit per reporting period.

- **Observational Prevalence Study**: Naïve observers systematically watch nurses prepare, administer and document medications—dose-by-dose without knowing the actual medication orders.
- **Medical Record Review**: Occurs after watching administration to compare doses given to doses ordered.

Why Naïve Observation?
Comparing Error Detection Methods

Research pharmacist confirmed 457 dose errors of 2556 doses (18% error rate).

Physician panel determined 35 were clinically significant – 71% detected by observation, 9% chart review, 0% incident report.

### Comparing Methods of Detection

<table>
<thead>
<tr>
<th>Method</th>
<th>Advantages</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart review</td>
<td>Retroactive; disposable data; commonly used; standardized criteria; poor at capturing latent failures</td>
<td>Difficult; time-consuming; labour intensive; planning criteria/indicators necessary</td>
</tr>
<tr>
<td>Claims data</td>
<td>Local data; captures latent failures</td>
<td>Litigation-based; legal implications</td>
</tr>
<tr>
<td>Incident reporting (sentinel events)</td>
<td>High-quality data; root cause analysis due; captures active and latent failures</td>
<td>Only detects severe, unexplained events/deaths; underestimated rates (blame and fear of punishment)</td>
</tr>
<tr>
<td>Voluntary reporting</td>
<td>Variety of sources; structured simple form; Captures active and latent failures; promotes a culture of safety</td>
<td>Variable quality; underreporting; blame culture; problem of data integration</td>
</tr>
<tr>
<td>Administrative data examination</td>
<td>Disposable and authoritative data; easy, standardized</td>
<td>Absence of clinical data</td>
</tr>
<tr>
<td>Computer monitoring</td>
<td>Multidata source; integration; real time; adverse events prevention</td>
<td>Inserted errors; poor software; poor triggers; undetermined future risks</td>
</tr>
<tr>
<td>Direct care observation</td>
<td>Accurate; captures active errors</td>
<td>Time-consuming; training difficult;</td>
</tr>
<tr>
<td>Patient monitoring</td>
<td>Data from outpatients; wide impact</td>
<td>Not standardized tools (interviews, questionnaires, focus groups, etc)</td>
</tr>
</tbody>
</table>


### Comparing Methods of Detection

<table>
<thead>
<tr>
<th>Method</th>
<th>Efficacy</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart review</td>
<td>Gold standard to detect adverse events; less medication errors detected; reviews, papers</td>
<td>Reviewers' training and time (nurses, pharmacists, students, physicians)</td>
</tr>
<tr>
<td>Claims data</td>
<td>Adverse events detected</td>
<td>Reviewers' training and time</td>
</tr>
<tr>
<td>Incident reporting (sentinel events)</td>
<td>Reports and alerts; detects adverse events, less medication errors detected</td>
<td>Root cause analysis</td>
</tr>
<tr>
<td>Voluntary reporting</td>
<td>Reports and alerts; feedback and corrective actions; medication errors detected</td>
<td>Time for feedback and analysis</td>
</tr>
<tr>
<td>Administrative data examination</td>
<td>Statistical</td>
<td>Routine evaluation</td>
</tr>
<tr>
<td>Computer monitoring</td>
<td>Prescribing faults, prescription errors, and dispensing errors (CPPE)</td>
<td>High costs for software and implementation</td>
</tr>
<tr>
<td>Direct care observation</td>
<td>Good quality data about administration errors</td>
<td>Nurse training</td>
</tr>
<tr>
<td>Patient monitoring</td>
<td>Future development</td>
<td>Nurse training</td>
</tr>
</tbody>
</table>

Systematic Literature Review of Detection Methods

- 2000-2009 review for comparison of methods using incident reports, chart review, observation, and trigger tools (28 articles).
- Direct observation yielded the greatest number of drug related problems, up to 400 times those reported by incident reports, trigger tools or chart review.
- Direct observation was the method most likely to identify problems identified by other methods (all were detected).
- Direct observations and chart review more labor intensive. Trigger tool most time efficient. Incident reports were the least expensive.
- Incident reports detected more severe events – likely to capture sentinel events.
- Direct observations results in only a brief snapshot of medication use. Trigger tools were suitable for time restricted environments.


Effect of Bar Code Assistance: Using the CALNOC Methods

- Use of the CALNOC Medication Accuracy Tool
- Measured Accuracy Before and After Implementation
- Med/Surg: Better patient identification, more distraction, more wrong-time errors but total errors did not change. 58% Decrease in errors when wrong time excluded!
- ICU No change in errors.

Structured Intervention With Front Line Nurses

- Use of the CALNOC Medication Accuracy Tool in the Integrated Nurse Leadership Program (INLP - QI collaborative to develop nurses’ leadership skills).
- Use of the 6 safety process to improve accuracy in 6 hospitals.
- Observations at baseline, 6, & 18 months after implementation of INLP.
- Accuracy improved from 85% to 96% over 18 months.


Observations

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doses</td>
<td>17,414</td>
<td>21,489</td>
<td>18,098</td>
<td>57,001</td>
</tr>
<tr>
<td>Units</td>
<td>144</td>
<td>136</td>
<td>87</td>
<td>229 (unique)</td>
</tr>
</tbody>
</table>
Medication Administration Errors

Error is a *dose administered differently than ordered on the patient’s medical record.*

**Doses Observed Compared to Doses Ordered**

- Unauthorized Drug
- Wrong Dose
- Wrong Form
- Wrong Route
- Wrong Technique
- Extra Dose
- Omission
- Wrong Time
- Drug Not Available

Safe Practices Evaluation

As the nurse prepares and administers each dose, does the nurse...

- Compare medication with the MAR
- Explain medication to patient
- Keep the medication labeled throughout process
- Check two forms of ID
- Chart medication immediately after administration
- Become distracted or interrupted
DATA REVIEW
Pre Publication Data Not Included for Distribution

Where do we go from here?
Focus on Safe Practices

- Compare medication with the MAR
- Explain medication to patient
- Keep the medication labeled throughout process
- Check two forms of ID
- Chart medication immediately after administration

- Create a medication administration culture that stops distraction or interruptions

“Portfolio” of Detection Methods Required

- Incident reporting not enough to gain comprehensive picture of risks
- Portfolio should be used in a systematic way – incident reports, surveillance/observations, and concurrent record review recommended
- Little overlap in the events detected by the three methods in study of 288 patients in London.

Olsen et al. (2007).
Hospital staff should use more than one method to detect adverse events and potential adverse events.
Quality Safe Health Care, 16, 40-44.
Save the Date!

CALNOC Annual Conference: Leading Transformational Change

June 13-15, 2012

Sacramento, California

Sheraton Grand Hotel