Improving the Safety, Efficiency & Effectiveness of the Medication Administration Process

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Reported Errors in Medication Management Process

Bar Code Medication Administration

Ordering 26%
Transcribing 0%
Dispensing 22%
Monitoring 2%
Administering 50%
CPOE

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Prepared by: Joan Ching
Date: 2/10

Current State
Value Stream Map
Medication Administration

Boundaries:
From: Signal to give medication,
To: Medication documentation

Distractions/Interruptions

Wrong time error
Wrong form error
No space in med room to prepare meds
Pause in process at PYXIS machine

Unsecure meds on top of COW

Wrong patient error
Wrong route error
Wrong med error
Wrong dose error
Wrong technique error

Waiting in queue at PYXIS machine

Moving pt furniture, getting water

It Takes Two” ID check

Operators Needed: 0.27

Value Added (VA) Time 0.08:15 h:m:s
Non Value Added (NVA) Time 0.02:29 h:m:s
% VA 69%

Operators Needed

Takt Time = Time Available / Demand (max washer output)

Demand (max washer output) 109 meds

Med of 4 timings

Lead Time 0.12 min
Cycle Time 0.04:19 h:m:s
Value Added (VA) Time 0.08:20 h:m:s
% VA 69%
% NVA 31%

Operators Needed: 0.27

Wrong patient error
Wrong technique error

Current State 2/10
CALNOC Medication Administration Accuracy Survey

- Systematic assessment, targeted improvement
- Barker & Pepper’s research
  - 1 of 5 doses in error
  - Wrong time 43%
  - Wrong dose 17%
  - 7% error rate (>40/day in 300-bed facility)

Betty Irene Moore
Comparing Error Detection Methods

Error = a dose administered differently than ordered on the patient's medical record

The Six Safe Practices

• Compares med w/ MAR
• Med labeled throughout
• Checks 2 forms of pt ID
• Explains med to pt
• Charts med immediately
• No distractions or interruptions
Our Study Methods: Observation & Error Review

Naïve observation 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 later to determine number, type of errors, and frequency of each type of medication error.
Baseline Measures
Jan-Feb 2010 N=898 doses

Safe Practices Defects
Baseline Measures
Jan-Feb 2010  N=898 doses

Type of Errors

- Improperly administered so as to alter drug’s effect

% Error  Cumulative %

Wrong time: 55%
Wrong technique: 24%
Unauthorized drug: 7%
Drug not available: 6%
Wrong route: 5%
Wrong dose: 3%

Given more than 1-hr before or after scheduled dose
Reducing Waste in the RN’s Day

The 9 AM Line-up

- Time
- Defects
- Motion
- Inventory
- Overproduction
- Transportation

Waste

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Approaches to Mistake Proofing

- **Vertical Inspection**
  - Inspecting the workflow

- **Control upstream processes**
  - Conditions that create defects

- **SWAMP**
  - Medication schedule

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**Horizontal Inspection**

Within the process

MOSQUITOES

Interruptions Room Layout

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Interruptions

• “Expected, natural component of RN work”
• 89% of interruptions negatively impact patient safety
  -- Hall, et al., JONA, 40(4), April 2010
• 12% in procedural failures
• 13% in clinical errors
• #interruption frequency #error severity
  -- Westbrook, et al., Arch Intern Med, 170(8), April 26, 2010
Visual Control & Mistake Proofing

Medication Room
Visual Control & Mistake Proofing

- Flashing bike light mounted to WOW pinnacle
- Widespread campaign
- A protected hour to exclusively focus on medications
  - Redirect telephone calls
  - Reschedule supply restocking
Walking
Wasted motion
Hunt-and-find
Forgotten supplies

Visual Control

Carry & go

CLEAN SUPPLY
767A
273 SF

SOILED UTILITY
767B
107 SF

Quick Check: do you have all of your supplies?
- Water
- Applesauce
- Spoon Straw
- IV Tubing

Self-Check

Point-of-use
**Medication Administration Schedule**

<table>
<thead>
<tr>
<th>Frequency Code</th>
<th>Standard Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>0900</td>
</tr>
<tr>
<td>q 12 hr</td>
<td>0900 - 2100</td>
</tr>
<tr>
<td>BID</td>
<td>0900 - 1700</td>
</tr>
<tr>
<td>Tid</td>
<td>0900 - 1300 - 1700</td>
</tr>
<tr>
<td>Tid with meals</td>
<td>0800 - 1200 - 1800</td>
</tr>
<tr>
<td>Tid ac</td>
<td>0700 - 1100 - 1700</td>
</tr>
<tr>
<td>Tid pc</td>
<td>0900 - 1300 - 1900</td>
</tr>
<tr>
<td>Qid</td>
<td>0900 - 1300 - 1700 - 2100</td>
</tr>
<tr>
<td>Qid with meals</td>
<td>0800 - 1200 - 1800 - 2100</td>
</tr>
<tr>
<td>Qid ac and hs</td>
<td>0730 - 1200 - 1700 - 2100</td>
</tr>
<tr>
<td>Qid pc and hs</td>
<td>0900 - 1300 - 1900 - 2100</td>
</tr>
<tr>
<td>q 2 hr</td>
<td>0900-1100-1300-1500-1700 etc.</td>
</tr>
<tr>
<td>q 3 hr</td>
<td>0100-0400-0700-1000-1300 etc.</td>
</tr>
<tr>
<td>q 4 hr</td>
<td>0100-0500-0900-1300-1700 etc.</td>
</tr>
<tr>
<td>q 4 hr while awake</td>
<td>0500 - 0900 - 1300 - 1700 - 2100</td>
</tr>
<tr>
<td>5 times /day</td>
<td>0500 - 0900 - 1300 - 1700 - 2100</td>
</tr>
<tr>
<td>q 6 hr</td>
<td>0600 - 1200 - 1800 - 2400</td>
</tr>
<tr>
<td>q 6 hr ac</td>
<td>0600 - 1100 - 1600 - 2300</td>
</tr>
<tr>
<td>q 8 hr</td>
<td>0100 - 0900 - 1700</td>
</tr>
<tr>
<td>q 8 hr</td>
<td>0500-1300-2100 (oral)</td>
</tr>
<tr>
<td>qam or daily</td>
<td>0900</td>
</tr>
<tr>
<td>q48 hr</td>
<td>Designated time printed on Medication Administration Record (MAR) every other day.</td>
</tr>
</tbody>
</table>

**Doses Dispensed by Day of Week & Hour**

**LEVELING PRODUCTION**

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Unit Dashboard

MEDICATION ADMINISTRATION DASHBOARD
NEUROLOGY-UROLOGY-NEUROSURGERY Level 17

Legend:  
- Better than CALNOC
- Worse than CALNOC

% Med Compared with MAR

% Med Explained to Patient

% Med Labeled Throughout

% Med Charted Immediately

% 2 Forms ID Checked

% Med Pass Distressed/Interrupted
2010 KAIZEN ACTIVITY

Rapid Process Improvement Workshops:
- Improving med room layout
- Medication preparation
- Medication administration
- Insulin administration
- Bar code medication packaging
- Bar code wrist band printing

Kaizen Events:
- Bar code medication supply
- Crushed enteral medications
- Reducing telephone interruptions
- ED medication preparation
- Standardized visual control @ automated dispensing cabinet
- Reducing interruptions in patient room
In 2010, we reduced the # of unsafe practices & med errors by 52%!

N=5,125 observed medication doses in 2010