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Collaborating With the Unit Clerk to Decrease Avoidable Interruptions During Medication

Administration on a Medical Surgical Unit

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Abstract

Medical errors are the third leading cause of death in the United States. Medical errors also incur significant cost ramifications due to increased hospital length of stay and fines. Medication errors, a type of medical error, are one of the most common types of inpatient errors. Nurses are most often responsible for medication administration, but safety during medication administration should be a priority of all hospital personnel. Avoidable interruptions during medication administration contribute to medical errors. Decreasing interruptions require increased nurse assertiveness during medication administration, interdisciplinary cooperation and unit culture change. This project identified that educating the unit clerk of their role in triaging phone calls and call lights can decrease nurse interruptions during medication administration. When the unit clerk discerned which phone calls were emergent and non-emergent and fielded non-nurse necessary calls to appropriate staff, there was a 43% decrease in nurse interruptions. This is encouraging data and further progress towards patient safety can be made with the collaboration of other hospital staff.

Assessment

Statement of the Problem

Medical errors are a dangerous product of the hospital microsystem and its foibles. In 1999, the Institute of Medicine famously published the “To Err Is Human” report, and asserted up to 98,000 people die in hospitals every year due to preventable medical errors (Kohn, Corrigan & Donaldson, 2000). This approximated number is already shocking, but more recent data suggests this number may be even higher. A literature review by James (2013) and published in the *Journal of Patient Safety* suggests that at least 210,000 preventable adverse medical errors occur per year and contribute to the death of hospitalized patients. This places deaths due to medical error as the third leading cause of death in the United States, behind cardiovascular disease and cancer, and ahead of chronic respiratory disease (Hoyert & Xu, 2012). Medication errors, defined as an error at any point of time from when a clinician prescribes a medication to when a patient actually receives a medication, are just one example of medical errors. The Agency for Healthcare Research and Quality (AHRQ) suggests that adverse drug events, or harm experienced by a patient as a result of exposure to medication, “affect nearly 5% of hospitalized patients, making them one of the most common types of inpatient errors”(AHRQ, 2012). An error can occur at anytime during the medication administration pathway, however, nurses are generally responsible for medication administration itself, especially in an inpatient setting. AHRQ suggests that minimizing interruptions during medication administration is a possible strategy that would allow nurses to administer medications safely. Buchini & Quatrin (2012) define an interruption “as any emergent or non-emergent stimulus that ‘halts the activity’ being performed for monitoring purposes or to carry out a secondary task.” And oftentimes, these interruptions are avoidable, meaning “could be performed at a later time, or independently by other staff members, or avoided by improved

organization of work practices.” As a clinical nurse leader, it is imperative to understand how a unit’s microsystem culture affects patient care, including safety. This critical thinking leads to the question: how do unit staff perceptions of the nursing role and safety contribute to avoidable interruptions during medication administration? And, how can interdisciplinary collaboration combined with culture change minimize avoidable interruptions, decrease medication errors and enhance patient safety?

Literature Review

The goal of the literature review was to understand how hospital culture and professional role expectations contribute to interruptions, identify the quantity and sources of interruptions during medication administration and explore how interruptions were addressed in various settings.

Though interruptions are the focus on this paper, they are just one of many concerns within the complex issue of medication errors. According to Agyemang & While (2010), “a medication error is a failure in the drug treatment process that leads to or has the potential lead to harm to the patient.” They are entirely preventable; yet occur “when human and system factors interact with the medication process to produce an unintended and potentially harmful outcome.” They are expensive mistakes in human terms, as they are the most frequent cause of hospital adverse events, and financial terms, with medication errors costing UK hospitals over 1.6 million pounds per year. Examples of medication errors include wrong dose, wrong time, wrong route, failing to administer a medication, or administering a medication that was not prescribed. The authors noted that the literature points to two categories of factors that contribute to medication administration error. The first category, personal factors, lists lack of adherence to policy/procedures, stress and tiredness, and lack of knowledge of medication. The second

category, organizational factors, lists distractions and interruptions, medication delivery systems, quality of written prescriptions, heavy work-load and multitasking and design of technology. Of note, several studies stated that distractions and interruptions were the most frequent organizational factor contributing to medication errors. Nurses agreed, and in one survey “94% of nurses felt that distractions in the workplace during medication administration contributed to errors.”

Westbrook et al. (2010) published the first study to statistically demonstrate that interruptions are directly associated with clinical error in the hospital. Researchers observed nurses during medication administration at two different hospitals and documented nursing procedures related to medication administration, details of each medication administered and the amount of interruptions experienced by the nurses. In order to identify clinical errors (i.e. wrong drug, dose, timing, etc.), observational data was compared with patient’s medication chart. After surveying 4271 medication administrations, they found that interruptions occurred in 53.1% of all administrations. An increased amount of interruptions within a medication pass coincided with an increase in clinical error. In administrations with no interruptions, 25.3% experienced clinical error, and in administrations with 4 or more interruptions, 30.4% experienced clinical error. Furthermore, clinical errors were categorized as minor or major in potential severity, with major errors leading to the potential for permanent reduction in bodily function or death. In a single drug administration without interruption, the estimated risk for a major clinical error was 2.3%. However, with 4 interruptions, the estimated risk doubled to 4.7%. These findings were consistent across both hospitals and independent of length of nursing experience, suggesting that the relationship between interruptions and clinical errors are strongly related and thus worthy of further examination, regardless of hospital and nurse specific characteristics.

An ethnographic study by Sorenson & Brahe (2013) observed five nurses work and qualitatively interviewed two nurses. The interviews were particularly revealing of how a nurse's own professional self-expectations allow avoidable interruptions to possibly occur. The authors suggest that nurses are "...placed in a dilemma between maintaining their focus on the task and their perceived need to be accessible." And ultimately, accessibility triumphs over uninterrupted task completion due to their commitment to "...the role of the accommodating nurse whose demeanor communicates an acceptance of approaches from others." The nurses were aware of the mental costs associated with their yielding to potential interruptions, commenting on their lost focus and lamenting the time and energy it took to regain concentration. They also admitted that having a more assertive attitude towards impending interrupters could be one way to emphasize the importance of maintaining attention during their work. From these observations, it can be surmised that addressing interruptions during medication administration requires a cultural shift both on a unit and within the nursing profession itself.

Kliger, Blegen, Gootee & O'Neil (2009) attempted to address medication errors by addressing policy, procedural and cultural processes. In their majority nurse-led intervention, they addressed six safety processes, one of which was centered on protecting medication administration from distractions and interruptions. To do this, the seven participating hospitals tested a variety of methods, including placing large posters on the unit with a list of quiet times for medication administration, requiring that medical team rounds only during non-medication administration times, and developing a script to educate other staff about the importance of a protected hour for medication administration. One particular hospital "created a protected hour...to focus exclusively on reconciling medication orders, administering medications, checking medication labels and charting the administration of medications." During this hour,

the unit clerk recited overhead announcements to mark the beginning and end of medication administration hour, screened all calls with a pre-approved script and took down messages so that calls could be addressed or returned after the completion of the hour. This effectively removed, on average, eight phone calls and three overhead pages per nurse in one hour. This example, in addition with several other interventions addressing issues other than interruptions, led to an improvement of medication accuracy “from 85% of medication doses being correct at baseline to 92% at 6 months after the intervention and 96% at 18 months after the intervention.”

When assessing medication administration, Buchini & Quattrin (2012) chose to solely focus on interruptions. They observed 18 nurses for 3000 work hours, and observed 1170 total interruptions. They determined 14 causes for interruption, 9 of which were categorized as avoidable. The avoidable interruptions showing the highest frequency were: management of requests from doctors/and/or other health-care professionals, management of call bells and illegible/incomplete pharmacy prescription. With this data, they proposed several possible solutions. One solution was to entrust the management of call bells to the nursing support personnel instead of the nurses. Another was to provide training to “foster collaboration and communication between professionals/health personnel.”

Lastly, Craig, Clanton & Demeter (2014) utilized multiple interventions to reduce interruptions and evaluated their effectiveness over a two week period. The authors noted a need for interventions to “combine apparel with behavior modification techniques, staff education and implementation checklists” and include the involvement of non-nurses. With this in mind, participating nurses were asked to wear a white vest with ‘Please do not interrupt while passing medications’ written in red on the back. This vest was worn for two hours during morning medication administration. Unit secretaries were also educated in the importance of holding

phone calls for nurses during medication administration and how to communicate with non emergent phone calls, such as family/visitors. On their particular unit, the most frequently observed interruptions were staff interruptions, phone calls and gathering supplies. At baseline, the most frequent interruptions were staff interruptions (32.7%) and phone calls (14.6%). After intervention, these interruptions decreased to 32.5% and 10.0%, respectively. Clearly, interruptions are preventable and can be addressed to enhanced patient safety.

The scientific literature affirms that 1) avoidable interruptions are a significant occurrence during medication administration and contribute to medication errors, 2) a variety of systemic and cultural factors impact interruptions and 3) medication accuracy can increase when interruptions are addressed with a multi-modality intervention.

Clinical Nurse Leader

This topic is especially suited for the clinical nurse leader role. As a lateral integrator, a CNL collaborates across disciplines, which is essential because research shows that the cause of interruptions is interwoven across hospital disciplines. The CNL is a transformational leader, who empowers nurses on their unit to be innovative and enact change—an important step in changing unit culture to decrease interruptions. A CNL is also a patient advocate, and the ultimate goal is to decrease avoidable interruptions in order to prevent medication errors and increase patient safety.

Diagnosis

Microsystem assessment

The study took place at an academic, county Level 1 trauma center in a large city on the west coast of the United States. The evaluation described in this paper was implemented on an adult medical-surgical/telemetry unit with 34 beds, 24 of which are dedicated to telemetry. This particular unit is chaotic. It receives the most admissions from the Emergency Department. Personnel are constantly going in and out of rooms, looking through patients' charts and inquiring about orders or updates in a patient's condition. Messages are often given via overhead intercom. Unit staff includes a unit manager, unit clerk, charge nurse, flex nurse (who accompanies patients on telemetry who are going off the floor for imaging studies), nine bedside nurses and four to six patient care assistants. Non-nurse staff include physicians, students, physical therapists, nutritionists, social work and kitchen staff.

Adherence to specific medication administration protocol and interruption avoidance varies depending on the nurse. A small portion of nurses assert themselves during medication administration when an interruption approaches, however, the vast majority do not.

Initial Observation: Medication Administration Time Study

In the very early stages of the study, a time study was conducted in order to understand how long each medication administration took per patient. The researcher documented the time it took to complete each step in the medication administration process (see Appendix A, Medication Administration Time Study (MATS) Collection Tool). Medication administration was observed for five patients. The average length of time for one medication administration for one patient was 23 minutes and 7 seconds. The medication administration step with the longest average time was lining up outside the medication room, at 4 minutes and 59 seconds. Further data can be examined in Appendix B, MATS Data.

Secondary Observation: Medication Administration Protocol and Interruptions

Hospital administration then directly requested the evaluation of current medication administration protocol and possible causes for medication errors. Initial baseline data collection included: whether or not specific steps in the medication administration protocol were performed, when an interruption occurred, the length of interruption and source of interruption (see Appendix C, Initial Baseline Assessment Audit Tool). Eight morning medication administrations and three evening medication administrations were audited. This initial audit revealed a total of seven interruptions during morning medication administration and one interruption during evening medication administration. The total time of interruptions was 15 minutes and 20 seconds. One interruption was due to a phone call, where a physician notified the nurse of an order change. (see Appendix D, Initial Baseline Assessment Data).

Fourteen nurses were also given a survey to complete. (see Appendix E, Nurse Survey). When asked how often they are interrupted during medication administration, 57% reported “Usually (45-89%)” and the remaining 43% reported “Sometimes (1-44%)”. 100% of nurses reported “phone calls” as type of interruption. The second most common interruption was “other patient needs attention”, reported by 93% of nurses. When inquired about possible solutions against interruptions specifically in the medication room, answers greatly varied. 29% of nurses recommended anti-interruption signs in the medication room, 21% asked for a change in unit culture and 43% skipped the question. When inquired about possible solutions against interruptions specifically during medication administration, 21% of nurses suggested that another staff take done phone messages. 21% requested more staff, such as patient care assistants, to handle non-RN required patient needs. And, 21% reported that preventing interruptions was just “not possible.” “We have a lot of little troubleshooting issues that just shouldn’t be part of the job,” reported one nurse. Another wrote, “I think this may be impossible for a unit that is as busy

as ours.” A third nurse was more optimistic, saying “all parts of medication administration are very important...it is very difficult not to talk, but frequent reminders and discussion of this topic should occur.” Further data can be examined in Appendix F, Nurse Survey Data.

In light of this observed data and survey data, a root cause analysis (see Appendix G, Root Cause Analysis) was conducted and found that possible interruption sources included supply issues, environmental/unit layout and policy requirements. However, in regards to avoidable interruptions, a particular focus was given during this study to phone calls, as 100% of nurses reported that this was a source of interruptions. How can avoidable interruptions, in the form of phone calls, contribute to possible medication errors?

Plan

The scientific literature emphasizes the importance of a multi-modal, interdisciplinary intervention when addressing avoidable interruptions during medication administration. Considering this, the planned intervention focused on the role of the unit clerk and utilized Lippitt’s theory as a framework for change. Lippitt’s theory was chosen due to its striking similarity to the nursing process, which was the basis of this nurse-driven project (Mitchell, 2013).

Lippitt’s theory, Stage 1: Assessment

After observing the unit at different times of the day and discussing with nurses, it was clear that an intervention would be strongest during morning medication administration, from 9:00AM to 11:00AM. This time period was suggested for several reasons. The majority of medications are being given at this time, thus requiring the most focus. Also, in the morning, patients often press their call light for morning needs, such as breakfast or assistance with activities of daily living. Medical teams also round in the morning and often interrupt the nurse

in person or via phone to communicate order changes. Family is also often calling for status updates of their loved ones.

During secondary observation, the unit clerk was not involved with any of the documented eight interruptions. However, the unit clerk plays a vital role in how communication is directed within a unit. The unit clerk is responsible for triaging incoming phone calls from family, physicians, patient transport, and many other personnel. They are also responsible for answering call lights, listening to a patient's request and calling either the RN or PCA to assist the patient. Their decision-making has a large impact on who makes contact with the nurse.

When further discussing this with a charge nurse, they noted that there is a large gap of skill between various unit clerks. There is no uniformity in call triaging, and thus some clerks are more proficient at screening calls when compared others. However, the unit clerk during weekday mornings and afternoons is regarded to be fairly capable of screening calls. Since medication administration tends to be busiest during weekday mornings, I specifically worked with this unit clerk.

First, it was important to emphasize to the clerk that the goal was not to give them more work, but rather to aid nurses in giving medications safely. This intervention was not blaming unit clerks for interruptions, but rather underlining their significant role in unit process flow as they are the gatekeeper of the phone lines. Second, it was critical to assess their current understanding of medication administration safety and the impact of phone calls during this time. The unit clerk's main concern was that they are not told when a nurse is giving medication; therefore they do not know when it is appropriate or inappropriate to contact them. If nurses told them when they were giving medication, they would be willing to redirect calls as necessary.

Lippitt's theory, Stage 2: Planning

With the scientific literature and staff input in mind, several strategies were created in order to involve the unit clerk in decreasing the amount of avoidable interruptions.

Firstly, a script of an overhead announcement of medication administration was created for the unit clerk (see Appendix H, Overhead Announcement Script). This announcement would remind all staff on the unit to be cognizant of medication administration during this time period.

Secondly, a medication administration sign up sheet was created (see Appendix I, Medication Administration Sign Up Sheet). On the sheet, a nurse would write down the start and end time of medication administration. The unit clerk would reference this sheet to determine if a nurse is free to be contacted or not.

Thirdly, the unit clerk was given an algorithm to guide call triage. (see Appendix J, Unit Clerk Algorithm). The algorithm instructs the clerk to consider if the phone call or call light is an emergent issue, and if not, can the non-emergent issue be deferred to other personnel, such as a patient care assistant.

Fourthly, if the phone call was non-emergent, the unit clerk was provided a message sheet to notate messages (see Appendix K, Message Sheet). Once a nurse completed medication administration, they could consult the message sheet regarding the need to return any phone calls.

Implementation

Lippitt's theory, Stage 3: Implementation

For baseline data collection, two morning medication administration periods were observed between 9:00AM and 11:00AM. The researcher sat by unit clerk at the nurse's station desk and counted the number of pages from phone calls, the number of call lights, the reason for the page/call light, if a nurse was necessary to answer the page/call light and if a nurse was interrupted during medication administration in order to attend that page/call light. (see Appendix L, Intervention Data Collection Tool).

Afterwards, the unit clerk was shown the overhead script, sign up sheet, algorithm and message sheet. They were educated on the purpose of each sheet and were reaffirmed on this project's purpose of decreasing avoidable interruptions, decreasing potential medication errors and increasing patient safety. The unit clerk and researcher did a "practice run" of this intervention for one morning medication administration period.

For post-intervention data collection, the researcher again observed two morning medication administration periods, sat by unit clerk at the nurse's station desk and recorded the same measurements gathered during the pre-intervention phase.

Timeline

This entirety of this project took place over the course of three months. Please refer to the GANTT chart in Appendix M for further details.

Cost Analysis

The financial pitfalls of medication errors are very substantial. According to the Institute of Medicine (Kliger, Blegen, Gootee, & O'Neil, 2009), medication errors cost \$4700 per hospital admission. Fortunately, this unit clerk based intervention is a focused, relatively inexpensive and not time-intensive. Ideally, a Clinical Nurse Leader would be present to drive the intervention. The median cost of a clinical nurse leader in the United States is \$76,986 (Payscale, 2014).

Thorough unit clerk education could be completed in three hours. Replacing the clerks during the three hours would approximately cost \$117. Additional costs include printing and office supplies, which would approximately cost \$100. Total costs would be less than \$300.

Additionally, the Centers for Medicare and Medicaid Services (CMS) developed the HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems) survey to measure patients' perceptions of their hospital experience. Survey questions include topics such as communication with and responsiveness of hospital staff, cleanliness and quietness of hospital environment and overall rating of the hospital. These scores are linked to the Hospital Value-Based Purchasing program, and help to determine CMS's reimbursement to a hospital. This intervention will help patients be confident in a hospital's ability to deliver safe care, thus directly impacting HCAHPS scores, and leading to increased reimbursement for a hospital.

Evaluation

Lippitt's theory, Stage 4: Evaluation

Final data can be found in Appendix N, Pre and Post Intervention Data. In the pre-intervention phase, a total of 52 call lights and phone calls were observed within the two-hour medication administration period. This total was similar in the post-intervention phase, with 51 call lights and phone calls recorded.

During the pre-intervention phase, 35 of the 52 calls were deemed to require a nurse and the nurse paged or called overhead 34 times. However, this data is skewed due to equipment issues. When a patient turns on their call light, their room phone is directed to a phone at the nurses' station. The unit clerk is in charge of answering this phone and asking the patient what they need. During pre-intervention data collection, this phone was malfunctioning and the unit clerk could not clearly decipher what the patient was asking. For safety reasons, the unit clerk

automatically paged the nurse. This occurred 12 times and was categorized as “nurse necessary”. However, these calls may certainly have not required a nurse, but due to phone issues, required the interruption of the nurse during medication administration.

During the post intervention phase, 16 of the 51 calls were deemed to require a nurse, and the nurse was paged or called overhead 11 times. During this data collection phase, the phone issue had been resolved.

There was a significant difference in the amount of non-emergent calls documented when comparing pre vs post intervention (17 calls and 35 calls, respectively). This contributes to the significant difference in nurses paged overhead (34 calls and 11 calls, respectively). The significant increase in amount of non-emergent calls during the post intervention phase may be attributed to the unit clerk’s increase in triaging during the intervention. Pre intervention, the unit clerk did not triage every single call. However, post intervention they did screen every call, uncovering a large amount of non-emergent calls that were previously assumed emergent.

Overall, there was a 43% decrease of nurse overhead pages. This is a significant decrease in the amount of times a nurse was paged during medication administration. This allowed nurse to focus and concentrate on giving medications safely. It can be suggested that a unit clerk centered intervention is effective and particularly useful in a busy academic hospital with constantly rotating staff. However, there are many ways this intervention could be further improved.

Recommendations

Due to logistical reasons, initial education was mainly provided to the unit clerk, charge nurses and unit manager. In the future, all personnel should be educated on the intervention. During the intervention, many nurses would forget to sign the medication administration sheet, other nurses would answer the phone and not utilize the algorithm and physicians were surprised and unsure how to contact the nurse. Some nurses would be hesitant to approach other nurses, while other nurses interpreted the two-hour medication administration period as a time where they could refuse talking to a single person. There was clear confusion over what was “allowed” and “not allowed” during this period. Nurses also gave the researcher useful feedback during the intervention, and this feedback would have been helpful if gathered prior to the intervention. All personnel must be educated to ensure buy-in from all disciplines, address initial comments and criticisms and ensure standardization of practice.

Data collection methods could also be improved. Prior to all data collection, it is imperative to define what incident is or is not an interruption. This was not done for this study, particularly during secondary observation, thus impacting the integrity of the results.

One lesson learned is that change is often difficult because different personnel have different priorities. This affirms the importance of initial assessment in order to understand how different people view a problem and its solution. However, different personnel are all still part of one hospital. This study affirmed that a seemingly small problem, such as interruptions, are part of a larger system and incur the responsibility of everyone in the hospital. A hospital must foster a work culture where all personnel share the same goals. Also, this project affirmed the value of an outsider perspective. When entrenched in a situation for an extended period of time, it can be difficult to think outside of the box. On the nurse surveys, most nurses had difficulty naming a

solution to interruptions, and were quick to say that it was impossible task. However, our data and the literature show that with a concerted and united effort, interruptions can be decreased.

Future recommendations for this intervention remained centered on changing culture and involving all health disciplines. Some additional interventions include signage, such as wearing a specific badge or bright vests during medication administration. Nurses should also be reminded of the importance of their role in medication administration and be equipped with techniques to assert themselves during this time period. For example, a simulation day for nurses would be helpful in modeling possible interruptions and practicing how to prevent them. Other personnel could be given a script on how to communicate with nurses during medication administration and alternate ways they could get their questions answered if the nurse is currently giving medications. Patients and their family could also be involved by giving them brochures explaining the importance of medication administration and how this will be reinforced on the unit, whether by overhead announcements or another chosen intervention.

Nursing Relevance:

Within the literature, interruptions are an oft-cited contributing factor to medication errors. All the nurses surveyed for this project expressed frustration with interruptions. Yet, many nurses acknowledged that they do not assert themselves against potential interrupters. And, when they do assert themselves, oftentimes the interrupter will ignore their protests. Nurses are responsible for the vast majority of medication administration, and should reinforce the importance of safety during this process to everyone on the health care team, including each other. Whether by developing on-unit initiatives to educate about interruptions or simply reminding colleagues that they are currently giving medications, this is an opportunity for nurses

to show hospital leadership and innovation. By addressing interruptions, nurses will improve process flow, enhance patient outcomes and improve both nurse and patient satisfaction.

Sustainability Plan

All materials used in this study were left with key staff, including unit manager and unit clerk. Ideally, a sustainability plan would include promoting existing infrastructure. For example, this would mean ensuring all phones are in working order so that calls can be effectively triaged. Also, improvement could be added to existing infrastructure. A CNL or similar role would be in charge of monitoring and evaluating this project for a longer time period. All staff should be shown the data to show if and how this intervention is improving their experience with medication administration. Lastly, if other disciplines, especially physicians, could be incorporated in the intervention, there would be more buy-in across personnel and entrench giving the nurse respect during medication administration as a hospital norm.

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be given (#PO, #IV, #IM, etc)		SQ	SQ	INH, 1 SQ, 1 TD	PO, 1 SQ, 1 TD	
Number of interruptions	1	0	1	1	0	.6
Lining up outside med room	0:43	10:10	2:10	4:40	7:14	4:59
Selecting and removing medications from omniceil	1:23	4:10	3:45	2:26	1:11	2:35
Wasting meds/preparing IV bags and lines/preparing injections/obtaining cosigner/etc.	0	0	0	0	0	0
Entering patient's room with COW and washing hands	12:23	0:30	0:15	0:43	1:03	2:58
Two patient identifiers (name and date of birth), allergies	0:15	0:24	0:20	0:54	0:19	0:26
Scan patient's barcode ID and scan medications	1:30	1:19	1:02	2:50	0:45	1:29
Providing medication education with teach back	0	2:30	8:39	10:51	0	4:24
Administering medications	1:06	3:07	2:30	4:43	3:39	3:01
Entering additional data (pain score, VS, injection locations) and clicking "Chart"	0	0	1:23	3:04	1:18	1:09
Leaving patient's room with COW and washing hands	0:10	0:09	0:20	0:11	0:15	0:13
Unexpected time delays (med requiring revised order, etc)	4:05	n/a	2:30	1:00	n/a	3:17
Total time	16:11	23:09	22:40	28:14:00	25:25:00	23:07

Appendix C
Initial Baseline Assessment Audit Tool

AM/PM SHIFT:
TOTAL # OF PTS:

MED PASS: _____ OF _____

Appendix D
Initial Baseline Assessment Data

COMPLETED? Y/N/NA	TASK	# OF INTERRUPTIONS	TOTAL TIME OF INTERRUPTIONS	COMMENTS
	Verify relevant information (i.e. pain scores, vital signs and other needed clinical information) prior to entering medication room			
	Enter the medication room and sanitize/wash hands			
	Select all medication(s) in Omnicell, verify against MAK			
	Remove medications from Omnicell, verify using the “five rights” (right patient, medication, dose, route and time)			
	Waste partial medication doses before leaving the med. room and cosign if necessary (i.e. narcotic waste, high-risk medications)			
	Label any medication that is not administered in its original container/syringe			
	Enter patient’s room and sanitize/wash hands			
	Verbally confirm patient’s name, DOB and any medication allergies against the MAK			
	Remind the patient: “for your safety, we will be asking for this information every time we give you any medications.”			
	Scan patient’s barcoded ID AND medication(s) to confirm the “five rights” (right patient, medication, dose, route and time)			
	Open and administer medications in front of the patient			
	Educate the patient: Include medication name, indications, and side effects.			
	<i>Remind Patient: It is important to SFGH that you always know and understand the medications you are taking and their side effects. Use teach-back to confirm understanding. Once the patient has received the medication and education several times, the patient should be able to provide the medication information independently.</i>			
	Ensure patient ingests the medications in your presence			
	Enter additional relevant information and then click “Chart” in LCR			

Type of Interruption	Frequency	Length of interruption (min:sec)
MD	1	1:00
RN	2	10:00
Diet Services	1	0:45
Patient Care Assistant	2	0:35
Self (i.e. forgot supplies)	1	1:00
Pharmacy	1	2:00
TOTAL	8	15 minutes 20 seconds

Appendix E
Nurse Survey

NURSE Questionnaire (please add any comments on the back of this page):

1. How often are you interrupted during each medication administration?

Interruption = stopped, faced with a barrier

- Always(90-100%) Usually (45-89%) Sometimes (1-44%) Never (0%)

2. What are the barriers or interruptions you face while administering medications? *Select all that apply:*

- Another nurse needs assistance
- Phone calls
- Waiting in line for med room
- Waiting for doctor/pharmacy
- Other patient needs attention
- Equipment not working/cannot be found
- There are no interruptions
- Other: _____

3. What do you do when you encounter an interruption or barrier during medication administration?

Select all that apply:

- Scanner doesn't work: _____
- Patient doesn't have a wristband: _____
- Medication isn't available: _____
- Other: _____

4. Where do interruptions occur the most? *Select all that apply:*

- Medication room
- Hallway
- Patient's room

5. What would prevent interruptions or barriers during your medication administration? *Select all that apply:*

- Additional equipment (EX: more COWS, scanners, dinamaps, etc)
- Improved equipment (EX: scanners, RN anywhere, functional COWs)
- Provide support for nurse-led patient education and teach-back (EX: written, audio, visual aids)
- Better or more direct communication with Pharmacy
- Better or more direct communication with PCP
- Improved staff culture regarding med pass (coworkers choosing to respectfully not interrupt you during med pass)
- Wearing medication vest, sash or button during medication administration to alert others to not interrupt.
- No improvements are needed for the medication administration process

6. Which part of the medication administration process is most time-consuming? What are some ways to improve those time consumptions?

7. What are some strategies or solutions to encourage no talking or interruptions in the med room?

8. What are some strategies or solutions to prevent *any* interruptions during the med pass (from the time you decide to give meds to walking into the patient's room to deliver them)?

Appendix F
Nurse Survey Data

Question 1: How often are you interrupted during each medication administration?

Always (90-100%)	Usually (45-89%)	Sometimes (1-44%)	Never (0%)
0	8	6	0

Question 2: What are the barriers or interruptions you face while administering medications? Select all that apply.

Phone calls	14 (100%)
Other patient needs attention	13 (93%)
Waiting in line for medication room	12 (85%)
Waiting for MD/pharmacy	10 (71%)
Another nurse needs assistance	10 (71%)
Equipment not working/cannot be found	10 (71%)
There are no interruptions	0 (0%)
Other	1 (.07%)

Question 3: Omitted due to poor phrasing of question, leading to incorrect answers.

Question 4: Where do the interruptions occur? Select all that apply.

Hallway	11 (79%)
Patient's room	10 (71%)
Medication room	9 (64%)

Question 5: What would prevent interruptions or barriers during your medication administration?

Improved equipment (EX: scanners, RN anywhere, functional COWs)	13 (93%)
Better or more direct communication with Pharmacy	9 (64%)
Additional equipment (EX: more COWS, scanners, dinamaps, etc)	9 (64%)
Improved staff culture regarding med pass (coworkers choosing to respectfully not interrupt you during med pass)	8 (57%)
Better or more direct communication with PCP	5 (36%)
Wearing medication vest, sash or button during medication administration to alert others to not interrupt.	4 (29%)
Provide support for nurse-led patient education and teach-back (EX: written, audio, visual aids)	3 (21%)
No improvements are needed for the medication administration process	0 (0%)

Appendix F (continued)
Nurse Survey Data

Question 6: Which part of the medication administration process is the most time consuming?

Waiting in line for medication room	6 (43%)
Pharmacy	3 (21%)
Medication room (omnicell, pulling medications)	3 (21%)
Interruptions	2 (14%)
Student nurses	1 (.07%)
Broken scanners	1 (.07%)
Charting	1 (.07%)
Patient education	1 (.07%)

Question 7: What are some strategies or solutions to encourage no talking or interruptions in the medication room?

Skipped question	6 (43%)
Signs/posters in medication room	4 (29%)
Change culture	3 (21%)
Wearing vest	2 (14%)
Better time management	1 (.07%)

Question 8: What are some strategies or solutions to prevent any interruptions during the med pass (from the time you decide to give meds to walking into the patient's room to deliver them)?

Take messages from phone calls	3 (21%)
More staff	3 (21%)
None – it is impossible	3 (21%)
Skipped question	3 (21%)
Hire more staff	3 (21%)
Educate staff	2 (14%)
Posters on unit	2 (14%)
Better communication with pharmacy	1 (.07%)
Saying “I’m on med pass”	1 (.07%)

Appendix G
Root Cause Analysis

Problem statement: Medication errors are a threat to patient safety and occur far too often. Interruptions during medication administration are one contributing factor to this problem.

Major categories of causes of the problem:

- **Staff/people**
 - Variety of personnel (physicians, physical therapists, PCAs, unit clerks, etc.) interrupt RN during med pass, possibly due to not knowing the importance of concentration during med pass. These interruptions range from change of orders to call light notifications. These interruptions are in person or by phone.
 - RNs often interrupt other RNs with both social and work related issues.
 - Family or patient may interrupt RN with a query
- **Supply issues**
 - Med is missing from omnicell, and RN must call pharmacy
 - Scanners often do not work, forcing RN to find a different scanner or manually verify medication
 - Patient does not have water at the bedside
 - RN may forget syringes, alcohol swabs or other accessories needed for administration
- **Environmental**
 - There is a central medication room, allowing people to congregate and chat with each other while gathering medications.
- **Policy**
 - Some medications, such as heparin and insulin, require a two RN check.

Appendix H
Overhead Announcement Script

Overhead Medication Pass Script

Beginning of medication administration - time: _____

“Attention [UNIT]. Medication administration has now begun. Please refrain from interrupting nurses at this time. Med pass time will end at _____. Thank you.”

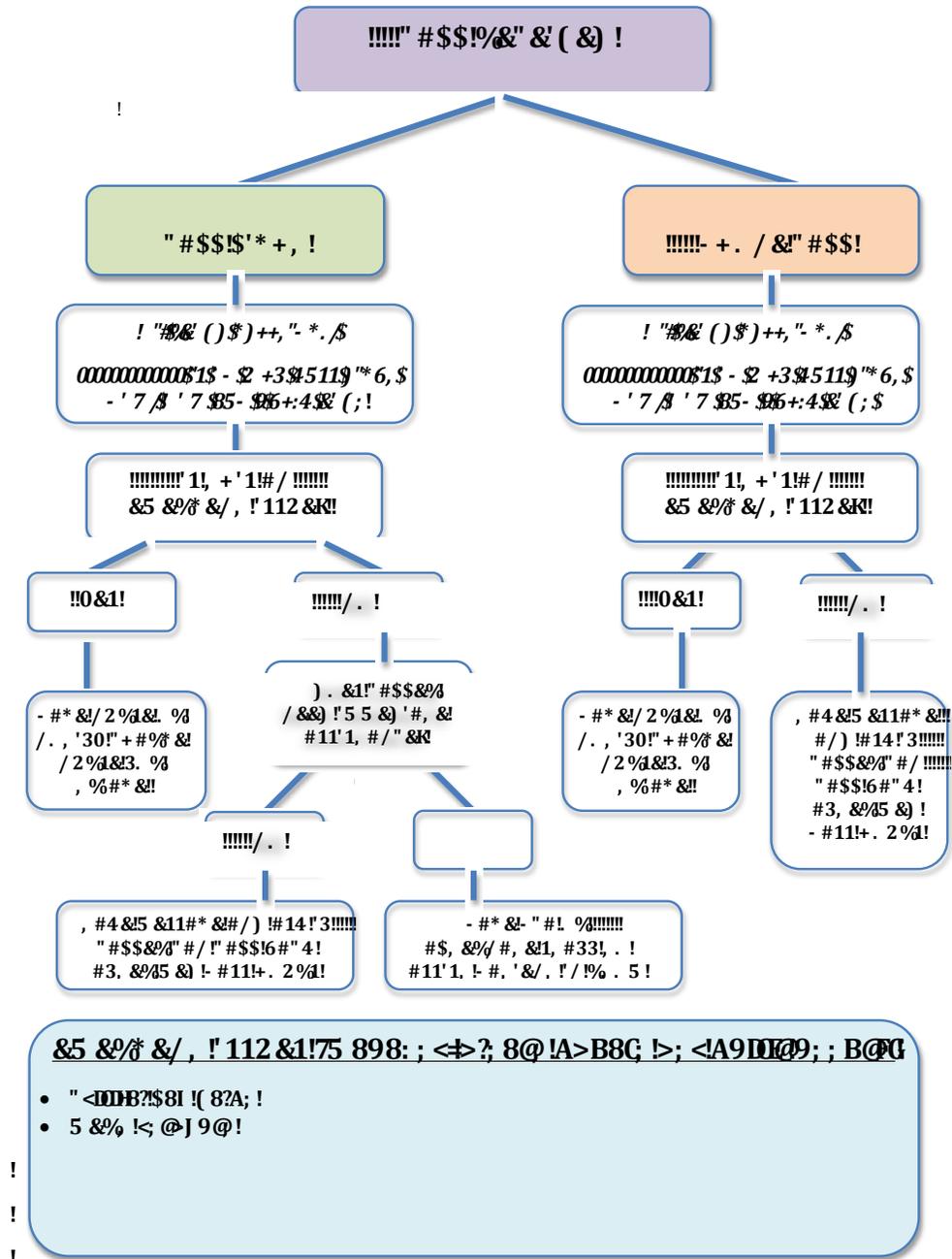
End of medication administration - time: _____

“Attention [UNIT]. Medication administration has now ended. Thank you.”

Appendix I
Medication Administration Sign Up Sheet

Date:

Please write name and check appropriate box when on and off med pass.



Activities	September 1-15	September 16-30	October 1-15	October 16-31	November 1-15	November 16-30
Microsystem Assessment						
Initial Observation: Medication Administration Time Study						
Secondary Observation: Med Admin Protocol and Interruptions						
Nurse Survey						
Baseline Data Collection						
Intervention Tool Development						
Intervention: Staff Education and Implementation						
Post Intervention Data Collection						
Closing Project: Debrief with unit staff, share results and provide framework for sustainability						

Appendix N
Pre and Post Intervention Data

	Pre Intervention	Post Intervention
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Number of med pass periods observed	2	2
Total amount of pages and call lights recorded	52	51
Number of pages/calls	22	32
Number of call lights	30	19
Nurse necessary/emergent call	35 [12 due to faulty call light phone]	16
Nurse NOT necessary/non-emergent	17	35
Nurse paged/called overhead	34 (65%)	11 (22%)
Nurse NOT paged/called overhead	18 (35%)	40 (78%)

REASON FOR CALL	Pre Intervention	Post Intervention
MD/Medical Team/Provider call	12 (23%)	16 (31%)
MERT/CODE	0	0
Admit	0	0
Discharge	0	0
PT/OT	0	1
RT/Speech Pathologist	1	0
SW/case management	1	1
Pharmacy	1	1
Clergy	0	1
Diet Services	0	0
Lab	1	2
CRITICAL Lab	1	2
Security	0	0
Pt request meds	1	1
IV assist	0	0
Pt request ADLs	27(52%)	16 (31%)
Pt request food/drink	3	1
Family calling re: patient	1	1
Family has request	0	0
Unknown	0	0
Nurse location	0	0
OTHER	3	8