NURSE LIKELIHOOD TO REPORT A PEDIATRIC MEDICATION ERROR:
EXAMINATION OF THE “PRE-REPORTING” PERIOD

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The University of Texas
School of Public Health, 2011

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Each year, hospitalized patients experience 1.5 million preventable injuries from medication errors and hospitals incur an additional $3.5 billion in cost (Aspden, Wolcott, Bootman, & Cronenwatt; (2007). It is believed that error reporting is one way to learn about factors contributing to medication errors. And yet, an estimated 50% of medication errors go unreported. This period of medication error pre-reporting, with few exceptions, is under-explored. The literature focuses on error prevention and management, but lacks a description of the period of introspection and inner struggle over whether to report an error and resulting likelihood to report. Reporting makes a nurse vulnerable to reprimand, legal liability, and even threat to licensure. For some nurses this state may invoke a disparity between a person’s belief about him or herself as a healer and the undeniable fact of the error.

This study explored the medication error reporting experience. Its purpose was to inform nurses, educators, organizational leaders, and policy-makers about the medication error pre-reporting period, and to contribute to a framework for further investigation. From a better understanding of factors that contribute to or detract from the likelihood of an individual to report an error, interventions can be identified to help the nurse come to a
psychologically healthy resolution and help increase reporting of error in order to learn from error and reduce the possibility of future similar error.

The research question was: “What factors contribute to a nurse’s likelihood to report an error?” The specific aims of the study were to: 1) describe participant nurses’ perceptions of medication error reporting; 2) describe participant explanations of the emotional, cognitive, and physical reactions to making a medication error; 3) identify pre-reporting conditions that make it less likely for a nurse to report a medication error; and 4) identify pre-reporting conditions that make it more likely for a nurse to report a medication error.

A qualitative research study was conducted to explore the medication error experience and in particular the pre-reporting period from the perspective of the nurse. A total of 54 registered nurses from a large private free-standing not-for-profit children’s hospital in the southwestern United States participated in group interviews. The results describe the experience of the nurse as well as the physical, emotional, and cognitive responses to the realization of the commission of a medication error. The results also reveal factors that make it more and less likely to report a medication error.

It is clear from this study that upon realization that he or she has made a medication error, a nurse’s foremost concern is for the safety of the patient. Fear was also described by each group of nurses. The nurses described a fear of several things including physician reaction, manager reaction, peer reaction, as well as family reaction and possible lack of trust as a result. Another universal response was the description of a struggle with guilt, shame, imperfection, blaming oneself, and questioning one’s competence.
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BACKGROUND

Medication Error

Since the first Institute of Medicine (IOM) Report published in 2000, estimating a rate of 98,000 preventable deaths every year (Kohn, Corrigan, & Donaldson, 2000), there has been a worldwide rally to investigate and prevent error in the healthcare industry (Beardsley & Woods, 1999). Medication related adverse events comprise the largest category of adverse events and account for 19% of the adverse events that led to the mortality predictions in the 2000 IOM report (Aspden, Wolcott, Bootman, & Cronenwatt, 2007). Therefore, the study and prevention of medication error as a subset of medical error is a natural extension of this national imperative.

Several organizations now support measures to study and improve the safety of the medication administration process and thus patient safety in general. For example, the Institute for Safe Medication Practices (ISMP) requires hospitals to establish standardized approaches to medication administration and monitoring of patients who receive high-alert medications (Cohen, 2007). The Institute for Healthcare Improvement (IHI) also focuses on medication safety and offers strategies to prevent medication errors and to identify errors before they reach the patient (Federico, 2007). The National Quality Forum (NQF) published thirty safe medication administration practices including the computerized prescriber order entry system (National Quality Forum, 2003). The Agency for Healthcare Research & Quality (AHRQ) funds research studies to promote evidenced based practice changes in the medication administration process (Agency for Healthcare Research and Quality, 2003a). The Joint Commission (JC) has begun imposing standards on accredited organizations to pay
attention to look-alike and sound-alike drugs frequently mistaken for one another if illegibly written, and to implement a list of Do Not Use Abbreviations (DNUA) to prevent errors related to misinterpretation of abbreviations. In April 2008, The Joint Commission published Sentinel Event Alert # 39 entirely focused on preventing medication errors in pediatrics because the JC recognizes that medication administration to children is different from medication administration to adults and dosing errors result in significant injury in children (The Joint Commission, 2008).

Reporting of a medication error is essential to ensure quick response by the healthcare team to minimize harm and sequelae from the event. Reporting of error also ensures learning occurs in order to prevent future similar errors from being repeated. However, according to Cullen, Bates, Small, Cooper, Nemeskal & Leape (1995), only six percent of medication errors are captured through hospital event reporting systems. When a medication error is not reported, hospitals cannot identify the human and system factors that contributed to the error, and thus cannot learn from the error to improve the systems and processes through which humans get the work done. Although error reporting is not the only way in which errors can be prevented, efforts to influence medication error reporting must be undertaken including research on reluctance to report errors (Crigger, 2005; Cullen, Bates, Small, Cooper, Nemeskal & Leape, 1995; Edmondson, 2004; Page, 2004; van Dyck, Baer, Frese & Sonnentag, 2005).
Medication Error in the Hospitalized Pediatric Population

Hospital inpatient medication error rates are reported in a variety of ways. Adult prescribing errors are reported to be as high as 0.3 prescribing errors per patient per day, of which 7.5% are considered serious; pediatric prescribing errors are reported to be 0.1 per patient per day, however, 19.5% are considered serious (Aspden, Wolcott, Bootman, & Cronenwatt, 2007). In addition to prescribing errors, errors during the administration of medications are also quantified. Pediatric medication administration error rates vary among available published studies due to variation in the different definitions of medication error and variations across practice settings (ambulatory, general care, ICU, and EC), but published reports vary from 4.2% to 30% (Aspden, Wolcott, Bootman, & Cronenwatt, 2007). Thus, pediatric medication errors, because of their reported rate and severity of injury, are of serious concern.

The Medication Administration Process

Medication errors are the most common type of medical error (Hughes & Ortiz, 2005). Consider the following diagram of the medication administration process:

Figure 1: The Medication Administration Process

[Diagram showing the steps of Prescribing, Transcribing, Dispensing, and Administering]
Safety checks and engineering controls are built into each step in the process. Hand-offs in the process are particularly susceptible to error because of potential mis-communications, and so are managed by specific routines the health care provider is required to follow. Every step is guided by procedure in an attempt to ensure that by the time the medication is administered to the patient, the medication is the right medication for the right patient. Most often the nurse is the one to finally administer the medication to the patient and has a required routine to follow to ensure all of the previous checks and double checks have worked in the process as she verifies the final checklist to ensure the right medication is being given to the right patient.

Medication errors may occur at any stage in the complex medication administration process: prescribing, transcribing, dispensing, or administering. Errors can be attributed to any number of proximal causes including but not limited to prescribing errors, transcription errors, inadequate drug stocking and delivery, inaccurate dose checking, inadequate monitoring, memory lapses, and rule violations (Aspden, Wolcott, Bootman, & Cronenwatt, 2007). A medication error is commonly considered a failure in the planning or execution in some step of the medication administration process and can include errors of omission or commission. Most errors are caught before they have a chance to cause injury to a patient. Medication errors without consequence outnumber events with harm by 100 to 1 (Spear & Schmidhofer, 2005). Thus harm is relatively uncommon in the healthcare industry. Calling a medication error an adverse drug event implies a preventable injury resulting from an unintended omission or commission of an error rather than injury resulting from the underlying condition of the patient (Aspden, Wolcott, Bootman, & Cronenwatt, 2007).
Quality Demanded by Consumers

Nurses strive to deliver conscientious, high-quality care to their patients. Perceived threats to the nurse’s ability to provide vigilance and prompt intervention include a multitude of influences in the healthcare community. The last twenty years of health care reform forced many hospitals to downsize, reduce the workforce, and cut costs. Restructuring of nursing staff and staffing plans often include alternatives to the expensive RN staff member. Due to the recent national focus on medical errors, consumers, media, and insurers alike are asking difficult questions requiring documentation of practice outcomes often in the form of a hospital report card. Simultaneously, both urban and rural hospitals are feeling the effects of a workforce shortage. The nursing workforce is aging and many nurses are close to retirement age. Nurses are leaving the profession citing tremendous physical and emotional requirements. The RN vacancy rate keeps climbing and fewer young people are being attracted into the profession. Hospitals are spending top dollar on temporary agency staff to fill RN vacancies, to offer competitive sign-on bonuses, top salaries, and other recruitment strategies. The AHA (2001) reports 34% of hospitals in one survey believe patient complaints are up because of shortages, and 59% report RNs believe it is harder to provide quality patient care due to a workforce shortage.

Despite advances in health care reform, hospitals are still suffering the fallout of limited reimbursement and tight purse strings to maintain their viability in the current post-managed-care environment. Cost containment is still a primary concern. Hospitals are held accountable for quality patient care outcomes and an aging, dwindling RN workforce.
complicates the picture. The public is concerned that fewer RNs could equate to even more error and compromise of quality care.

**Nurses on the “Sharp End”**

Nurses are on the front line of patient care delivery and have an opportunity to improve patient safety in the medication administration process. Nurses staff hospitals twenty-four hours a day, seven days a week, and are responsible for monitoring the patient’s condition, detecting changes in the patient’s condition, and taking quick action to prevent deterioration in the patient’s condition. Critical decision-making on a minute-by-minute basis is the responsibility of the registered nurse. This primary responsibility is the reason nurses have been described as being on the “sharp end” of errors (Reason, 1997, p. 10). The implication of the sharp end is that as the last person in a long chain of events leading up to a medical error, it is the nurse who is often the last person in this cascading process who can catch the error before it is carried out and reaches the patient.

It is reported by Leape (1995) that nurses intercept 86% of all medication errors. Another study in a hospital environment observed that the incidence of process failures facing nurses is almost one per nurse per hour creating a need for constant, quick, problem-solving to achieve the desirable outcome for the patient (Edmondson, 2004). This would suggest that workflow in the hospital creates an inherent barrier to reporting and learning from daily problems. This same study revealed that 93% of nurse responses to these problems were to find a quick fix or workaround to get the job done; only 7% of nurse responses involved reporting the problem to someone in a position to investigate it.
It is suggested that healthcare is possibly the only remaining high hazard industry in which organizations continue to focus investigations into accident causation around this individual nurse on the sharp end. Gaba observes that, “It is easier to point fingers at a single individual rather than to ask the hard questions about the latent errors that allowed that person’s actions” (2000, p. 95). A culture of blame persists in those organizations that do not take an organizational approach to root cause investigation. When hospitals move beyond blaming the person who made the error, and accept organizational responsibility, there is much to be learned. Hindsight bias is one phenomenon that has perpetuated a culture of blame. In hindsight bias, the situation appears to be solved when an individual takes responsibility for an error. Because of hindsight bias, investigators looking at an error after it has happened may never completely comprehend the complexity of the situation as it was experienced by the person at the time (Institute for Safe Medication Practice [ISMP], 2000).

This study is based on the assumption that once a medication error is made, the reporting of that error is a positive and constructive action. While many reasons for underreporting can be identified, the continuation of errors suggests lessons in the industry do not translate to prevention and remediation. The health care industry must learn from error to prevent future error. One way to learn from error is to talk about it, and one way to begin talking about error is to report it; thus, the need to increase error reporting.

A fundamental requirement leading up to reporting of an error is the ability of the individual to internally process and resolve any perceived incongruence they experience once they realize they made a mistake, and may be responsible for that mistake. The nurse must reconcile this fact with his or her perception of themselves as a healer and one who does no
harm. A number of medication errors, because of their nature, are evident immediately because harm occurs to a patient requiring medical intervention to reverse or manage the consequence of the error. The majority of medication errors, however, result in no harm to the patient. Thus, the majority of medication errors fall into the category of potentially unreported.

According to The Gallup Organization, nursing is the most highly trusted profession in the United States (Jones, 2010). Nursing is also an intimate business. There are very few professions in which the customer shares intimate details of their life and allows him or herself to become so vulnerable. This reality of being a healer and a comforter may contribute to a nurse’s unrealistic perception of the nursing profession and themselves as doing no wrong, and certainly doing no harm. When a nurse makes a medication administration error, an internal psychological struggle may naturally ensue because of this disparity between believing oneself a healer and knowing one just may have harmed a patient. The result could be a reluctance to report medication errors and a possible temptation to hide or cover up an error.

**Summary**

Nurses do and will make mistakes. Process experts tell us that if a person performs a process enough times, a mistake will eventually be made by that person performing that process and error rates increase as the number of steps in a process increase (Nolan, 2000). The medication administration process consists of approximately 40-60 steps. A 50-step process is predicted to be completed successfully with no error only 61% of the time (Botwinick, Bisognano, & Haraden, 2006).
There is no consistent policy or procedure in place in health care to help nurses deal with their reactions generated upon the realization that a medication error has been made. Constructive changes are in order to help nurses cope with the emotional impact. Medication errors are under reported and reporting rates must improve if the health care community is to investigate and learn from error in order to eliminate future potential for repeating that error. The irony is that health care workers work within a system that has many disincentives to reporting.

It is imperative that hospital leaders better understand the lived medication error pre-reporting experience of the pediatric nurse. Of particular interest are those factors that weigh on the nurse’s mind that contribute to or detract from the likelihood of an individual to report an error. The personal perceived dissonance, decision-making, introspection, and dissonance reduction occurs in context of the medication administration error itself, in context of the personal history that the nurse brings to the situation, and in context of the organizational culture at the time. All of these factors play a role in this pre-reporting phase.

**Research Question**

The purpose of this study is to inform policy, organizational leaders, educators, and nurses themselves about the likelihood to report medication errors; and to contribute to a framework for further study around nurse likelihood to report medication errors. Although error reporting is not the only way in which errors can be prevented, the healthcare community ought to identify interventions to help the nurse understand the possible inner turmoil around reporting errors and help the organization increase reporting of errors in order
to learn from errors and reduce the future likelihood of a similar error from occurring, thus improving patient safety.

The research question is: “What factors contribute to a nurse’s likelihood to report an error?”

The specific aims of the study are to:

1. Describe participant nurses’ perceptions of medication error reporting;
2. Describe participant explanations of the emotional, cognitive, and physical reactions to making a medication error;
3. Identify pre-reporting conditions that make it less likely for a nurse to report a medication error; and
4. Identify pre-reporting conditions that make it more likely for a nurse to report a medication error.

**Conceptual Framework**

*Organizational, Individual, and Work-Related Factors Contribute to Reporting*

The interaction between the nature of the work, the organizational context, and the individual’s characteristics influence the reporting experience and thus likelihood to report. The diagram below depicts several contextual elements that may be influential during this decision-making period and emotional upheaval for the pediatric nurse.
Each set of elements in each category brings a unique set of circumstances to bear on each new medication administration procedure. The complexity of the continually changing work environment, changing patient condition and needs, emotionality, interruptions, and constant re-prioritization by each nurse for each patient, is recurrent and fluid, one situation to the next, one patient to the next, one nurse to the next, and one organization to the next. Each new medication administration procedure is a unique procedure. It is necessary to understand
the elements involved in each of these three categories as the decision to report is made within this ever-changing context.

**Characteristics of the Work Setting**

An organization’s culture and its culture of reporting are unique to that organization. There are no studies comparing compliance with medication error reporting in community vs. teaching hospitals, profit vs. non-profit hospitals, or pediatric vs. adult hospitals. Compliance with reporting requirements in any healthcare setting is inconsistent at best. Various reasons suggested for this underreporting vary from lack of time in the busy healthcare environment to fear of blame and reprimand (Blegen et al., 2004). There may also be an uncertainty about what and when to report in an organization. Because terminology is different from one institution to the next, it is not always easy to differentiate a near-miss from an actual error, an incident from an accident, and an error from a mistake.

Also affecting compliance with reporting of medication errors is a ‘normalization of deviance’ occurring in the healthcare field (Gaba, 2000, p. 96). Nurses and physicians both report errors according to a hierarchy of perceived significance. One survey at a large northwestern pediatric hospital that was distributed to a random sample of 200 physicians and nurses, revealed that both physicians and nurses were more likely to report errors that reach the patient as opposed to near-misses that were caught before reaching the patient (Taylor et al., 2004). This same survey reported physicians and nurses were more likely to report more serious errors than those perceived as less serious. Many healthcare workers consider errors along a hierarchy of importance and consider some events excusable. Trivializing error may contribute in a significant way to under reporting.
The patient care unit is fast-paced, noisy, and is known to be full of interruptions, distractions, admissions, transfers, and emotionally stressful situations. Many suggest that errors in health care delivery are inevitable and advocate that the work environment should not only minimize the likelihood of error, but once an error has occurred, ought to enable employees to report the error, learn from the error, and be free of the blame and shame that so frequently surrounds these emotional events. Van Dyck et al. (2005) differentiate ‘error prevention’ attempts to avoid error and models of ‘error management’ that focus on reducing the negative and increasing the positive outcomes of error. Error prevention strategies are known to prevent error. They include labels on syringes, unit-dose dispensing systems, automated dispensing systems, bar-coding systems, and unique lettering on labels to emphasize the different spelling of look-alike and sound-alike medication names. The authors suggest a focus on error management can also improve organizational performance. They state that in an error management culture, errors are quickly reported, negative consequences are minimized, and learning and improvements are the result.

**Characteristics of the “Work” of Medication Administration to Children**

The metabolism of children is different from adults, their bones and nervous systems are growing rapidly during childhood, and therefore present increased risk of severe consequences to improper medication dosing and administration. The child’s small body weight and immature physiologic systems make infants and children susceptible to dosing calculation errors. There is a sensitivity and emotional reaction when learning that a child has been harmed by medical error. If a calculation error is made and a six-month old infant receives a ten-fold IV medication dosing error, a nurse’s reaction to this may be different.
than if this error was made on a 60-year-old patient on a ventilator whose mature metabolic systems often adjust and compensate for a ten-fold error with minimal residual adverse effect.

Health care workers in a children’s hospital understand that their safe dosing calculations are of critical importance in therapeutic regimes. Extra engineering controls and double-checks are built into the medication administration system in a pediatric hospital for this reason. The most frequently reported errors in inpatient pediatric units are incorrect dosage, incorrect frequency, incorrect medication for the condition being treated, wrong route, failure to recognize interactions, lack of monitoring for side effects, and inadequate communication between physician and the team/family. Several recommendations have been made for nurses to address these issues, including: order verification, patient identification, and checking medication calculations with a second individual (Committee on Drugs and Committee on Hospital Care, 1998; Aspden, Wolcott, Bootman & Cronenwatt, 2007). Indeed, the April 2008 Joint Commission Sentinel Event Alert was devoted to pediatric medication administration and how it is different from medication administration for adults. The issue provided recommendations for interventions specific to making pediatric medication administration safer (The Joint Commission, 2008). It’s reasonable to believe that the experience of making a medication error in this higher-than-normal risk environment and the subsequent emotional and cognitive response to the realization that one has made an error in medication administration to a child might be different than when the work involves administration of medications to adults or the elderly for whom the error might be reversed with fewer consequences. It seems reasonable then to ask the question of whether the
experience of realizing one has made a medication error and now ought to report it might be different in a specialty hospital by a specialty nurse in a special population depending on the perceived vulnerability of that population.

**Characteristics of the Pediatric Nurse**

There is no known literature describing the motivation of an individual nurse who seeks out pediatrics as a professional specialty. It is unknown whether the pediatric nurse’s experience in making errors and reporting errors is different from the experience for an adult medical/surgical nurse, or a nurse in long-term care. Each nurse espouses his or her own belief system, sense of honesty and morality. Crigger (2004) suggests that a nurse needs to adopt an ethical response to error or to respond with the virtues of honesty and humility. Honesty requires an ethical obligation to disclose mistakes. Humility requires the ability to recognize and be humble about one’s flaws or an acceptance that one is not perfect. Crigger calls these two components essential to overcome the mental suffering that ensues once an error is realized. However, when an error is made by a nurse at the point of administration to a patient, there is no procedure book to guide the nurse. Smith and Forster (2000) underscore the fact that no mandate for reporting of error resides in the codes of ethics for the various professional organizations. The American Medical Association (AMA) encourages workers to deal honestly with patients, and the American College of Physicians (ACP) suggests physicians disclose errors in procedures if that information is material to the patient’s well-being. The American Nurses Association (ANA) code of ethics simply states that nurses are responsible and accountable for judgments and actions, and the American Hospital Association (AHA) recommends that healthcare professionals not conceal adverse events.
None, however, speak to a duty to report and disclose to supervisors or patients. No standard approach exists that can be used by healthcare professionals and hospitals to assist the individuals who have to deal with the emotions that result when errors are made (American College of Physicians, 1998; American Hospital Association, 1991; American Medical Association, 1992; American Nurses’ Association, 2005).

Individuals possess their own degree of honesty and humility that is brought to bear in each unique situation within the context of the work environment. Circumstances may be perceived by the nurse as such a threat that even the most honest and humble nurse may find it hard to report an error. This perception of fear and threat may be a barrier to reporting and is under explored in the literature. This personal experience as perceived by the nurse is yet to be described through the lived experiences of the nurses themselves.

**Theory of Cognitive Dissonance**

Festinger (1957) first labeled the term dissonance to refer to a cognitive inconsistency or tension between what one believes and what one has done or how one has behaved. Most of the initial research involving dissonance was conducted within a framework of forcing a subject to engage in undesirable behavior, which then elicited a sense of dissonance in the individual whose feelings and responses were then measured. The state of cognitive dissonance motivates the individual to resolve the dissonance or disparity between the two opposing realities, thus reducing the cognitive tension.

The following are three modes of dissonance reduction identified by Festinger (1957):

1) modification of the initial attitude, value, opinion;
2) adding new beliefs including seeking out new information all of which serves to reduce overall inconsistency - thus making the attitude vs. behavior relationship seem more acceptable or justifiable (Simon et al; 1995); and

3) minimizing the importance of one or both dissonant elements (trivialization).

The following figure depicts this researcher’s interpretation of possible cognitive dissonance following realization of personal responsibility for a medication error in context of the complex health care work environment.
### Figure 3: Possible Dissonance Resulting From Nurse Medication Error

<table>
<thead>
<tr>
<th>Nurse Characteristics</th>
<th>Error Context</th>
<th>Cognitive Dissonance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• I am a good person</td>
<td>• Interruptions</td>
<td>• I did this and yet I am a good person</td>
</tr>
<tr>
<td>• I am a great nurse</td>
<td>• Distractions</td>
<td>• I always go through my checks before I give this med; why didn’t I this time?</td>
</tr>
<tr>
<td>• I am a healer</td>
<td>• Latent factors</td>
<td>• If only I had …</td>
</tr>
<tr>
<td>• I am careful</td>
<td>• Fatigue</td>
<td>• I just hurt my patient</td>
</tr>
<tr>
<td>Individual Characteristics such as:</td>
<td>• Training</td>
<td>• I will be blamed</td>
</tr>
<tr>
<td>- Education</td>
<td>• Work-arounds</td>
<td>• Will I be blamed publicly?</td>
</tr>
<tr>
<td>- Age</td>
<td>• Time Pressure</td>
<td>• Does everyone have to know?</td>
</tr>
<tr>
<td>- Sex</td>
<td>• Labeling</td>
<td>• What will my co-workers think of me?</td>
</tr>
<tr>
<td>- Experience</td>
<td>• Tightly-coupled processes</td>
<td>• I need to tell someone and talk about this</td>
</tr>
<tr>
<td>Unique moral compass</td>
<td>• Faulty Technology</td>
<td>• I will be written up for this</td>
</tr>
<tr>
<td>- degree of honesty</td>
<td>• Miscommunications</td>
<td>• I should write up an incident report myself</td>
</tr>
<tr>
<td>- degree of humility</td>
<td>• New equipment/procedure/patient/diagnosis</td>
<td>• The physician will think I am a bad nurse</td>
</tr>
<tr>
<td>Perception of blame and shame (consequence) in the organization reporting culture</td>
<td>• Organizational culture around error prevention and reporting</td>
<td>• The physician needs to know</td>
</tr>
<tr>
<td>Observed organizational response to others who have made errors</td>
<td></td>
<td>• The patient has a right to know</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• This will be on my record</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The family may sue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Is disclosing the right thing to do for me?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I may lose my license</td>
</tr>
</tbody>
</table>
Stadler and Baron (1998) offer an interesting perspective as they describe the results of a study on attributional complexity as a moderator of dissonance-induced attitude change. Similar to individuals with high self-esteem having multiple self-affirming resources in their repertoire to cushion their response to perceived dissonance, it appears that some people have enough attributional resources (complex attribution cognitive thought processes to search for reasons) to be comfortable with ambiguity and dissonance. Those high in attributional complexity also utilized external attributions more effectively than those with low attributional complexity. The authors conclude that dissonance does not affect everyone the same way. There are possible moderators at work (self-esteem and attributional complexity) moderating the dissonance reduction process.

**Theory of Self-Reconciliation**

Crigger & Meek have identified four phases in the process of self-reconciliation, which is the process the nurse experiences to make sense of the two realities of what one believes about oneself (I am a good nurse) and what one knows as a fact (I just committed a medication error). Following interviews with nurses covering seventeen errors, four distinct phases of self-reconciliation were identified by these researchers:

- **Reality-hitting:** described as a sense of shock, shame, comparison of the error to the standards of how they should have performed, physiologic reactions, and loss of self-esteem;
- **Weighing-in:** depicted as the cognitive processing around the fact that the mistake has not yet been discovered by others, whether there was harm done,
the likelihood of discovery by another, the number of mistakes already made and possibly known by others, family member presence, patient awareness, and whether the culture is a safe one in which to report;

**Acting:** involving apology to patients and peers if the error is publicly known and is described as being followed by relief and closure, if the error is only privately known, the authors report no sense of relief and closure;

**Resolving:** involving evaluation of the harm done in order to move on.

The authors describe distinct paths among their subjects leading to moving on with and without continued dissonance. If the nurse takes a path of denial and blame and does not disclose or report the error, the nurse remains in a limbo or watchful waiting and may still choose to report. However, the watchful waiting may continue and the nurse may choose not to report the error leading to a lack of resolution. Unresolved cognitive dissonance is described by these subjects as involving recurring feelings of pain and remorse, crying, and self-deprecation. If the opposite path is followed in which remorse leads to a report of the error, this can be followed by acts of compensation, apology and resolution. One nurse reported that simply telling someone about the error was therapeutic. Crigger and Meek (2007) also describe clear categories of coping or defense mechanisms applied by subjects in their study. Attempts to resolve the dissonance included apologizing and restorative actions that were observed as the most healthy, denial that was observed as less healthy, rationalization that was also seen as less healthy but also the most frequently reported action,
and diminishing the degree of harm in attempts to reduce the disbelief, blame, denial, and threats to self-esteem.

Models of Medication Error Prevention and Management

The goals of an event management system are to understand the contributing factors to an event and to eliminate or minimize future occurrences. Error analysis and prevention can be approached from a person, engineering, or organizational model but must include analysis of the unsafe act, workplace contributing factors, and organizational or latent factors (Reason, 1997). An organizational model is more inclusive viewing errors as a symptom of more deeply rooted latent conditions in the organization (Reason, 1997). Organizations should have both proactive measures and reactive measures in place. Proactive self-assessment is key to evaluating current critical processes that could house several latent factors. One proactive safety assessment designed to reduce possibility of error is the Failure Modes and Effects Analysis (FMEA). The FMEA is actually a JC mandate for healthcare organizations (Reason, 1997). This self assessment helps an organization understand inherent risks in a process. Reactive posturing enables an organization to learn from accidents that do happen. This takes the form of learning from internal event reporting systems as well as collective sharing of lessons-learned as a nation. Current organizations contributing to this collection and sharing of medical error data include JC, MERP, ISMP, and AHRQ (AHRQ, 2009; Al-Assaf, 2003).

The Eindhoven Model of incident causation succinctly depicts the elements of human, technical, and organizational factors that contribute to the potential for error, as well as the layers of defenses in place to prevent an error from occurring. The Eindhoven Model,
like James Reason’s Swiss cheese metaphor depicts the situation when the organizations’ defenses may or may not be adequate to prevent an incident. The Eindhoven model then makes explicit the role of human recovery as a final opportunity to identify and prevent an error from occurring (Henneman & Gawlinski, 2004).

Observing the fact that staff nurses are the frontline caregiver in much of the healthcare delivery process, the Eindhoven model has been adapted to reflect that unique role played by nurses and to emphasize the pathway to the near-miss is through the frontline caregiver. This leads to support of the position that human recovery which can prevent an error, is often a “nursing recovery” that stands between the occurrence of an adverse outcome and prevention of an adverse outcome (Henneman 2004, 197-200). This means nurses on the “sharp end” are also uniquely positioned to “catch” errors before they reach the patient.

Error management models differ slightly from error prevention models. On the error prevention side, healthcare has been adapting lessons learned from the aviation industry, another high-hazard industry, to investigate the multiple contributing factors to error in healthcare in order to prevent errors as much as possible. Workplace engineering controls as well as human factors science are being applied to understand and prevent medical error as much as possible (Tamuz & Thomas, 2006). Fatigue, lighting, noise, distraction, interruptions and other contributing factors are being addressed in efforts to reduce the potential for error in a complex system. Error management models (Van Dyck, Baer, Frese & Sonnentag, 2005) describe actions taken once the error has been reported or discovered. Organizational actions to address error management include demonstrating that the organization values the information about the error, will act on the information about the
error, will provide feedback to staff about the error, and is not afraid to make changes in processes and traditions that may have contributed to the error.

A review of the literature reveals that much is written about error prevention and error management strategies. The literature is sparse, however, when we look for the period of introspective pre-reporting which occurs between prevention and management. Therefore a description and understanding of the psychological experience of the health care provider over whether or not to report an error is missed. Nurses indicate under reporting is related to a list of things including fear of manager reprimand, desire to save-face with peers, fear of legal repercussions, and threats to licensure (Blegen et al., 2004; Chiang & Pepper, 2006). Yet little is known about this period during which the healthcare provider is consciously considering whether to report or not. All or some of these concerns and fears are processed in this pre-reporting period of which so little is known.

The diagram below depicts this researcher’s conceptual placement of the pre-reporting period in the error reporting continuum.
Some nurses may perceive no struggle during the pre-reporting period and may not be hesitant to report they made a medication error. However, Barach and Small (2000), report that more than 50% of medication errors go unreported and there is evidence of altered emotional response to realizing one has just made a medication error (Crigger & Meek, 2007; Wu, Folkman, McPhee & Lo, 1991; Zeelenberg, Beattie, van der Plight & de Vies, 1996). Behavior in this critical period immediately after the realization of making a medication error has the potential to improve error reporting. Further, there is opportunity to intervene and assist nurses in dealing with this turmoil. Nurses can be helped to better manage this
emotional period and seek a healthy resolution with less psychological trauma. Indirectly, this resolution is expected to facilitate increased reporting.

**Summary**

All of the preceding frameworks provide a lens through which to help us understand the nurse’s likelihood to report a medication error, and are derived from a structure that at a very fundamental level involves an individual working in the context of the health care environment and caring for children. Lessons from the error prevention and error management literature encourage a shifting to a blame-free environment and encourage nurse reporting of error. However, an understanding of the likelihood to report medication errors will not be complete without an examination of this pre-reporting phase during which humans perceive, process, and manage the emotional impact of a medication error. Decisions made during the pre-reporting period involve choice and decision-making, but must take into account self-esteem and one’s image of oneself as a human being and as a nurse in a healing environment. Commission of an error involves introspection as realization of the responsibility for an error unravels in the dynamic and chaotic environment of a busy hospital unit, which is part of a larger hospital system.

**Literature Review**

*Initial Emotional, Physical, and Psychological Response to Realization of Error*

The literature is sparse in an understanding of how nurses process through this period between error prevention and error management that is referred to in this research as the pre-reporting period. However, several studies are evident in the literature investigating
physician emotional response to making errors. In their studies of physician residents, Zeelenberg, Beattie, van der Plight & de Vies (1996) and Wu, Folkman, McPhee & Lo (1991) suggest strong emotions of regret, guilt, a general sinking feeling, fear, panic, agony, humiliation, and sadness all emerge in response to realizing one has made an error. They also note that errors can lead to a positive growth experience, observing that the greater sense of responsibility, disclosing, apologizing, and making amends about the mistake leads to a positive change in future behavior. Zeelenberg (1999) proposes that regret is an immediate desire to undo an error and have a second chance, and leads to learning from one’s mistakes. Mizrahi (1984) and Wu, Cavanaugh, McPhee, Lo & Micco (1997) also describe subsequent coping responses such as discounting, distancing, accepting responsibility, seeking social support, and denial.

**Process of Reporting an Error**

Hospital event reporting systems have been utilized since the 1960’s, primarily serving the function of alerting the Risk Management Department to potential claims. Most errors are today reported through this same organization-based event reporting system. Typically, these are errors that reach the patient and most often have some adverse effect on the patient. Healthcare settings look at each incident as it is reported and typically create counts or rates. The count may be shared with each hospital unit, and trends may be revealed through monthly tracking. These reports may also be monitored at the organizational level to watch for trends across units. The voluntary reporting system in many hospitals relies on the clinician reporting each event. Voluntary reporting systems may be anonymous or not, and some may be used in the disciplinary action process against the clinician. Once the event has
occurred, the error is reported and captured in the organization’s event reporting system in order to assess contributing factors as well as evaluate subsequent responses to the error.

A number of unnecessary and preventable errors and deaths are reported through event reporting systems, yet the most troubling statistics are those that relate an underreporting of medical errors. The available literature suggests an under reporting of events by as much as 50%-90% (Barach & Small, 2000). There are many reasons proposed in the literature contributing to this under-reporting. These include reports that physicians and staff fear legal liability with reporting and counseling for misconduct, lack of time, fines, and general fear of reprimand (Blegen et al., 2004).

There are additional reasons that contribute to reduced reporting. Most errors are caught before they have a chance to cause injury to a patient and so medication errors without consequence outnumber events with harm by 100 to 1 (Spear & Schmidhofer, 2005). One survey of 200 nurses and physicians in a large children’s hospital located in the northwestern United States indicates these healthcare workers admit that they are more likely to report errors that reach a patient as opposed to near misses caught before reaching a patient, and also admit to reporting more serious errors than those perceived as less serious (Taylor et al., 2004). Reasons reported by study participants include being too busy, reporting takes time, and if there was no harm to a patient, there is less significance to reporting. This same survey reveals that only 31.7% of respondents report they would report an event in which breast milk syringe was connected to an intravenous line but caught before entering the line (Taylor et al., 2004).

Clinicians are also uncertain about what and when to report. Definitions are
inconsistent from one hospital to the next. Even more confusing to clinicians, employees in one hospital may be expected to report only errors that result in harm to a patient but in another are expected to report even the near miss that never reaches the patient. One hospital may want to hear about all difficulties, frustrations, pharmacy errors, illegible handwriting, and even physician prescribing errors; however, another may require reporting of only errors that reach a patient.

**Culture of Blame**

If errors are inevitable and will occur, and may lead to negative outcomes, then learning from those mistakes and evaluating one’s own actions is essential. Learning is more likely to occur when emotional impact of the error is reduced. Van Dyck et al. (2005) suggest that a fundamental attribution bias exists in healthcare organizations because talking about and admitting an error may lead to negative attribution of blame by peers and managers. The authors continue to suggest that when individuals are not punished for their errors, there is less stress and emotional burden because there is less need to cope with a negative self-image. Therefore there is less hiding of errors and blaming of others.

An organization may announce to its employees that they now have a culture of reporting or a culture of safety, but unless the organization’s behavior in seeking out the sources of error are visible to staff and perceived as sincere and non-punitive, there will not be a behavior change among staff. The ISMP suggests that a reporting system that includes punishment as a consequence of reporting is “bound to fail” (ISMP, 2000, p.1). It is also logical that a culture of fear and retribution can result in cover-ups in an organization (Rogerson, 2004). It is estimated that only 1 in 10 significant medical errors are reported
(Perry, 2001). According to the ISMP (2000), if a hospital employs a superficial analysis of incident reports, not really looking for the non-human factors that contributed to the error, this system will inhibit open discussion of error, inhibit reporting, and yield nothing about system or latent factors.

Jellison and Green (1981) cite several studies from the empirical literature that bear out a pervasive attribute among common man to overestimate the importance of another’s personal or internal disposition relative to external or environmental causative factors. This is referred to as the fundamental attribution error. This suggests it is a well-documented phenomenon among human beings to blame another for a negative outcome and not look at the situational factors that may have contributed to that outcome. This tendency, the authors relate to a need to create a positive impression. These authors elaborate on a dilemma facing an individual who needs to explain his/her own behavior resulting in a negative outcome. The source of this dilemma resides in the belief that there is more social disapproval resulting from negative actions resulting from internal causes (as opposed to negative actions that result from external or environmental causes). It is further observed that offering internal attributions may lead to greater punishment from society for this is an acknowledgment of responsibility, than would offering up an external explanation for causality for negative outcomes (called the self-serving bias). The research conducted by Jellison and Green (1981) revealed that social approval increased with expressed internality, supporting the hypothesis that expressing internality as a cause would be related to increased amounts of social approval or liking.
Locke and Pennington (1982) offer a distinction between the two terms, causes and reasons. Reasons serve to explain or justify behavior by helping us understand it, whereas causes offer no justification, but rather objectively relate the behavior as the outcome of a set of conditions. Reasons are one kind of cause. These authors go on to distinguish that agents or people attribute their behavior to the situation and offer reasons for their behavior (Locke and Pennington, 1982). They go on to describe that a person may not have control over certain character traits or external forces, but the person does believe certain reasons justify their behavior. They purport that the agent will tend to explain his/her behavior in terms of reasons because reasons take into consideration all factors at play at that time, even external or situational factors. The observers, on the other hand, will tend to overattribute the cause of behavior to dispositional factors within the agent, and underattribute causation to situational factors when explaining behaviors of others. The agent and observer are simply using different perspectives in or “different parts of the same total explanation” (Locke and Pennington, 1982, pp. 218); the cause not being any one thing, but instead, a whole constellation of factors.

In this case, expressing responsibility for error, would gain a nurse social approval, and may promote the likelihood to report an error. The fundamental attribution error is a documented phenomenon among human beings to blame another person for a negative outcome and not to look at the situational factors that may have contributed to that outcome. The fundamental attribution error helps explain a past and current culture of blame in organizations and offers support for efforts that ought to be brought to bear in organizations to overcome blame and promote trust. The purpose of event reporting is not to place blame,
but rather to learn from and prevent the error from recurring, or prevent someone else from making the same error by fixing the system in which we practice. There is a constellation of contributing factors that lead to errors, and it is the perspective of the individual and the system within which they work, that must be included in the root cause analysis of each error.

**Desire to Do No Harm**

Nursing is a profession that has historically prided itself on its mission of healing and perfection (Leape, 1994). Nursing is also the most trusted profession according to the Gallup organization (Jones, 2010). By virtue of being human, nurses have their own needs for self-esteem and desire to be perceived in a good light by others. The behavioral theory of cognitive dissonance (Festinger, 1957) may help explain what occurs in an individual who believes one thing about him or herself (as a nurse I am a caring professional, I am clinically competent, and I strive to produce safe and quality outcomes for my patient), and then finds that he or she has just made a medication error. This situation creates a disparity between the person’s beliefs about oneself and the person’s undesirable behavior.

The work of Crigger & Meek (2007) has been described in the Conceptual Framework. Their application of the theory of cognitive dissonance warrants attention and is one model that may help put this struggle with perfection into perspective. One additional instance in the literature of researchers applying the theory of dissonance to nursing and perfection is the work of Meyer and Xu (2005). These researchers refer to the effect of dissonance early in a nurse’s academic studies and its effect on the nurse. They examined the academic ideal of nursing and describe what is experienced by nursing students as they make
the transition from the ideal they learned in the classroom to the reality of the hospital floor as the students observed the work-arounds, errors, impersonal care, and exceptions to rules they were taught. This incongruence leads to dissonance and disillusionment in the system. These authors go on to conclude that this vast difference between ideals and reality creates stress and tension for the new graduate nurse and should be addressed early in the nurse’s academic studies through prompt discussion of each dissonant experience.

**Self-Preservation**

Complicating a movement away from a culture of blame, Smith and Forster (2000) speak of the irony inherent in the healthcare system in which threat to licensure, organizational reprimand, and possible legal repercussions are the result of error reporting. At the same time the healthcare system is attempting to promote increased reporting of errors, these threats may burden the clinicians who report. In the organization that does not have a positive approach to managing errors, but rather has a blaming or punitive culture, the authors purport that the individual needs to cope with the negative self-image that results from the error, and may need to hide errors and may blame others.

In addition to cover up, blame, and other reasoning that may take place in the mind of a nurse who has just discovered he or she has made a medication error, the desire to preserve self-esteem may also lead to minimization of the severity or importance of the error. Trivialization as described by Festinger (1957) refers to the act of reducing the importance of one of the dissonant cognitions and may be easier than changing an attitude about oneself. This assumption was employed in a study conducted by Simon, Greenberg, & Brehm (1995), which supported the use of trivialization as a common method of dissonance reduction.
These scientists suggest that when putting more serious actions in perspective, subjects seem to dismiss the current dissonant cognitions and actions as unimportant. This is similar to recent observations made of nurses and physicians who seem to trivialize minor medication errors with no harm to patients and do not report them, but would tend to report more serious errors and errors that lead to harm for patients. (Taylor et al., 2004).

In addition, self-affirmation is self-talk to improve self-concept such as ‘I made the error, but I am an otherwise good person.’ Several actions might result: trivialization to reduce dissonance (Simon, Greenberg & Brehm, 1995) or self-talk needed to improve likelihood to report a medication error. Martinie and Fointiat (2006) investigated the relationships between self-esteem, trivialization, and attitude change in response to cognitive dissonance. Based on self-affirmation theory, they compared individuals with high self-esteem to individuals with low self-esteem. Their results demonstrated low self-esteem individuals perceive dissonance and reduce dissonance by trivialization. They hypothesized that high self-esteem individuals retain more internal affirming resources, and use whichever method of dissonance reduction was presented to them first. Their conclusion was that self-esteem is a moderator of dissonance reduction strategies, supporting the works by Stadler and Baron (1998), and Jellison and Green (1981).

Crigger and Meek (2007) applied the theory of cognitive dissonance and proposed a theory of self-reconciliation which attempts to describe the nurse’s process of regaining self-worth after commission of a medication error. In the nurse’s natural need to reduce the tension that arises, the nurse seeks to reduce the dissonance. What may ensue is a rationalization or even a series of rationalizations to justify or support the behavior
(mediation error), resulting in a change in a previously held belief, or trivialization in order to fit the behavior. The resulting new belief might not be accurate or true, but serves to reduce the internal cognitive tension and makes the nurse feel better about him or herself.

Crigger and Meek (2007) are the first to propose a theory of self-reconciliation which begins to explore the psychological trauma the nurse may experience including guilt, shame and loss of self-esteem. The phase of weighing-in is descriptive of the conscious processing through a decision of whether to report or not to report. All nurses may not struggle to the same degree with this turmoil but the high rate of unreported errors suggests that this psychological struggle warrants investigation. If the nurse avoids reporting or actively covers up an error, there may be additional harmful psychological effects to the nurse related to the cover-up. It is this complexity of feelings and emotions before reporting an error, in the pre-reporting period that are important to describe and understand. Helping nurses cope effectively with commission of an error and assisting nurses in moving through this period of reconciling cognitive dissonance is crucial to effect an improvement in error reporting rates.

**System Complexity in a High-Hazard Industry**

Health care is a high-hazard industry. Like the aviation industry, the chemical industry, the railroad industry, and the nuclear power industry, systems in the healthcare industry are complex, involve many handoffs in the production of the work, and when accidents happen the impact is significant to many. Both Perrow (1999) and Reason (1990) use the concept of “defenses in depth” to describe the many and often redundant layers of defenses, barriers, and safeguards in place in a high-hazard environment to defend against error (Reason 1990, 7). These layers should be intact but often have holes or system failures.
The metaphor used quite often is the block of Swiss cheese cut into slices. The slices line up as layers of defense. The holes in the cheese represent latent failures or potential sources of error according to Reason (1997) and come from two sources: 1) active failures and 2) latent factors. People can create a hole or weakness in a defensive layer with an unsafe act called an active failure. Latent factors arise from organizational procedures, culture, and even from systems outside of the hospital walls, all of which compose the systems and processes through which work is done. Reason gives several examples of latent factors in hospitals such as less than adequate supervision, poor system design, product manufacturing defects, time and production pressures, lack of available supplies, unrealistic policy and procedure, and inadequate training. All of these may be latent for many years before combined with just the right set of circumstances and active human failure to create a line of perfect accident trajectory through the holes in the layers of defenses. It is because of these layers of defenses that errors are often prevented in complex systems (Reason, 1997). These redundant layers may also make errors more likely. Indeed, errors sometimes occur because the employee cannot outperform the systems in which they work.

In dissecting the anatomy of a medication error, the contributing elements are not always adverse until mixed together in the right combination: an illegible physician order is written, the right drug is involved, on the right day, with the new inexperienced pharmacist dispensing the wrong dose, the right level of distraction, the right level of fatigue, the right level of mis-information given to the nurse, etc. This suggests that if one of those factors could be addressed and prevented, the error would not occur. Clinicians may be unaware how
many latent factors in the system wait for just the right alignment to occur for another accident trajectory to develop.

Perrow (1999) in a similar way describes healthcare systems as complex and as such having developed complex layers of defenses against risk of harm to patients. Hospital systems are also tightly coupled or so tightly interwoven that an action in one area creates a subsequent action in a neighboring system and so on with a domino effect of reactions, all of which must be controlled by technology or protocol to prevent resulting risk of harm to a patient.

The Normal Accident Theory (NAT) elucidated by Perrow (1999) suggests that in a complex, tightly interwoven system like health care, accidents are inevitable. The NAT describes many interactions, communications, and hand-offs that occur and are at times unpredictable, with many feedback loops and indirect information sources, with numerous stages and components in product (healthcare) production. Tight coupling is an engineering term that refers to the manufacturing production line processes that are often tightly coupled. The production line is linear and simple; one step closely follows another. There is no simple linear production sequence to healthcare. In a similar, yet non-linear way, healthcare systems are also tightly coupled: delays are unacceptable, supplies must be readily available, medications and treatments must be given on time, equipment cannot fail, and interfaces between systems require critical handoffs to ensure continuation of care in the next system (Perrow, 1999).

Authors describe in addition the multitasking in which hospital nurses engage. By observing the work of hospital nurses, Tucker & Spear (2006) have discriminated the
continuous problem-solving and re-ordering of tasks undertaken by nurses in any one shift in order to adapt plans to the continually changing needs and conditions of the patients. Nurses do not provide sequential care to one patient after another, but instead switch their attention and thoughts among patients and reprioritize multiple tasks and duties required during the shift. In addition, these researchers have begun to quantify the numerous equipment glitches, lack of available equipment, delays in procedures, and other constant interruptions and distractions in the hospital unit. Because human and organizational precursors to error are difficult to control, human distraction and forgetting as well as the limits to the brain’s processing power contribute to potential for error, leading many to question the safety of the multitasking required in hospital nursing (Powell, 2005).

The High Reliability Organization Theory (HROT), on the other hand, suggests that accidents can be prevented to within a very small risk of failure through an enhanced culture of safety, learning from accidents, continuous training and simulations, and good organizational management and design. HROT organizations employ layers of defenses and constant vigilance (Reason, 1997). Although HROT and NAT are seemingly exclusive of one another, both theories help explain efforts toward a system of maximum safety, and both can be useful as Perrow describes to “inform one another” and help achieve maximum safety in organizational systems (Perrow, 1999, pp. 368-372).

**Cognitive Processing**

Cognitive psychology literature offers theoretical models to help us understand the nature of human error. Theorists explain that the amount of cognitive effort is different if an activity is rule-based, or familiar and unconscious to humans versus knowledge-based, or
requiring thoughtful and conscious analysis (Rasmussen, 2003; Leape, 1994; Reason, 1995). Human ability to process two things at once has also been studied in relation to error. Tasks that can be automatically processed, can be performed successfully simultaneously by some people. However, pairing of different task type combinations is often not successful. A task that must be consciously processed like tasks requiring more thoughtful attention, cannot be paired with a task requiring automatic processing without risking error. Combining a second task requiring deliberate thought leads to a bottleneck in human cognitive processing. As a result of this knowledge, the aviation industry now considers take off and landing procedures as critical and policy now forbids talking about anything other than flight information during these times. Healthcare professionals experience frequent interruptions and distractions in the course of the day and this knowledge of cognitive psychology is recently being applied to error prevention studies and suggestions to protect the nurse from interruptions during medication administration.

**Texas Nursing Peer Review Legislation**

In Texas, an additional challenge may exist for licensed nurses. It is possible that nurses in Texas under-report errors for fear of being reported to the Nursing Peer Review process in their institution. Texas Nursing Peer Review legislation requires every healthcare organization employing 10 or more nurses to manage an internal process to review cases of conduct subject to reporting and make recommendations for further referral of the nurse to the BON (Board of Nurse Examiners for the State of Texas, 2007). Some nurses may believe that fear of Nursing Peer Review makes event reporting that much more difficult because of fear their nursing license is in jeopardy. The Texas State Board of Nurses employs a
mandatory reporting rule, requiring each registered nurse (RN) to report a nurse suspected of engaging in reportable conduct. Nurses report fearing the Nursing Peer Review process and subsequently may under-report.

Summary

Given the fact that the primary reporting mechanism for error in health care is the incident report, and given that incident reports are often used in the disciplinary process, secrecy and avoidance of reporting have emerged in the health care system. There is a reluctance to report one’s own errors if it can be avoided. The healthcare industry has a long history of fundamental attribution error in which people are blamed for error and negative outcomes along with a simultaneous failure to look at situational factors that contributed to the error. If a nurse reports an error, then the nurse subjects his or herself to possible ridicule, explanation to the physician, formal investigation, and even threat to licensure.

The literature lacks an understanding of the reporting experience, and especially this pre-reporting experience from the nurse’s perspective. Crigger and Meek (2007) explored nurses’ responses to a medication error and have articulated a theory of self-reconciliation that transpires during the pre-reporting period and is based on the theory of cognitive dissonance. They suggest additional research around this process.

Finally, nurses work in a profession that historically has prided itself on healing and perfectionism (Leape, 1994). Nurses are perceived as the most trusted and ethical of professions (Jones, 2010) and work in organizational cultures in which blame and shame are historically inherent, even if those cultures are changing and getting better. Nurses work with other human beings who have a natural tendency to blame others (Jellison and Green (1981)
and work in systems that are very complex, with tightly-coupled processes requiring many hand-offs in the course of a day, with distractions and interruptions and problems to solve on a daily basis and so are vulnerable to making mistakes. Nurses are subject to wanting to perceive themselves in a good light to support their own self-esteem needs, are fallible and will make mistakes, and will someday find themselves having to reconcile having made an error. Nurses deserve to emerge from the experience with their self-worth intact, having learned from the error, and also having helped a system learn from the mistake.

**Public Health Significance**

The mission of the United States Department of Health and Human Services (HHS) includes the protection and advancement of the physical and mental health of the nation. The HHS establishes health policy and enforces laws to ensure the safety and efficacy of medications (United States Public Health Service (PHS), 2008). Under the HSS, the agencies of the United States Public Health Service (PHS) coordinate and collaborate among all healthcare agencies toward the end of public health and safety. Two of the PHS agencies in particular, the AHRQ and the FDA, are engaged in the mounting effort to improve reporting of error in healthcare and minimize the occurrence of error in the nation’s healthcare systems.

The U.S. Food and Drug Administration (FDA) provides leadership and regulation around the safety and effectiveness of drug product labeling and manages the nation’s voluntary adverse event reporting system (AERS). Once the data is inputted by hospitals and practitioners, the AERS system distributes quarterly reports and recommendations depending
on the event category such as dosing confusion, drug name confusion or pediatric overdosage due to labeling confusion (U.S. Food and Drug Administration [FDA], 2009a; FDA, 2009b).

The AHRQ conducts national health services research around the quality of healthcare in the United States with a goal to improve outcomes and reduce cost (AHRQ, 2009). The AHRQ espouses a long-term plan to promote a culture of patient safety in hospitals. The agency conducts and sponsors research around outcomes in the healthcare industry. One study funded by the AHRQ reports fear of litigation as a major disincentive to reporting in hospitals (AHRQ, 2003b). The AHRQ also conducts an annual voluntary hospital survey called the Hospital Survey on Patient Safety Culture, as a tool to assist hospitals in this effort. The agency publishes an annual comparative database report on findings. The 2008 report summarized two areas of focus for hospitals that would have the most significant potential for improvement of a culture of patient safety: 1) utilize a less punitive reponse to errors; and 2) improve the under reporting of errors (AHRQ, 2008b). The data collected demonstrates that 64% of staff respondents in these hospitals still feel errors are held against them and kept in their personnel file. The report also offers an example of two extremes in the study, underscoring the wide range of reporting practices in the nation’s hospitals. For one hospital in the study, 96% of their respondents had not reported even one event over the last 12 months. In another hospital, only 5% of respondents from that hospital had not reported at least one error in the last year.

The Institute of Medicine (IOM) provides evidence-based advice to policy makers, the public, and health professionals. The IOM’s current agenda is to improve the safety of medication administration. In the results of a recent study sponsored by HHS, the IOM
reports alarming injury rates and estimates the cost of medication errors in the nation’s hospitals. This study demonstrates that 400,000 of the drug-related injuries that occur in our nation’s hospitals on an annual basis are preventable (Aspden, Wolcott, Bootman, & Cronenwatt; 2007). Using these 400,000 preventable events, it is estimated that hospitals incur an additional $3.5 billion in cost as a result. Lost wages and lost productivity are not included in this figure and it is impossible to accurately describe the cost of preventable medication errors. This same report estimates errors occur at a rate of one per hospitalized patient per day. Knowing that error rates vary across all the nation’s hospitals, and there is widespread under reporting in the system, the report places the number of preventable injuries that occur from medication errors at 1.5 million each year.

Agencies under the aegis of the nation’s PHS translate evidence into policies and programs and disseminate learning to improve knowledge and practice, thus improving the nation’s health and safety. The public health community is raising awareness, funding research, translating knowledge into practice standards, advocating for policy change, and promoting legislation around this critical issue. Through the coordinated efforts of all, awareness will be raised and lives will be saved.

This research study will use the knowledge made available by various public health agencies, build upon its foundation, and will further examine nurse likelihood to report medication errors keeping in mind the long term goal of improved error reporting and improved patient safety. To accomplish this end it is important to understand all contributing factors to the current widespread under reporting in our own nation’s healthcare system.
METHODS

Study Design

A qualitative research design was utilized to achieve the specific aims of the study. A qualitative design enabled the researcher to learn from the lived experiences of pediatric nurses practicing in the inpatient hospital environment. Qualitative methods, specifically the self-contained group (Morgan, 1997) was used to explore the medication error experience and in particular the pre-reporting period or weighing-in process, from the perspective of the nurse.

Instrumentation

No suitable existing discussion guide was available. The group interview questions designed for this research were designed to solicit open-ended and detailed descriptive responses to questions about nurses’ feelings and emotions surrounding commission and reporting of a medication error. The group discussion guide is located in Appendix A.

The flow of the group interview was made to be as conversational as possible given the structured discussion guide format. The group moderator was attentive and engaged, and used active listening techniques, pauses and probes during the interview. The moderator was aware of and observant of the effect that her presence and mannerisms had on the group interview process. Observations about the effect of self and the effect of participant behaviors was noted in a field notes notebook immediately after each group interview while reviewing audio recording so as not to lose the nuances of behavior that may have affect subsequent responses and flow of the group interview.
A small number of open-ended questions were utilized so that the desired answer was not implied and to encourage descriptions by respondent. Conversational probes were used to encourage participants to elaborate or dig deeper into a key subject, if necessary. A discussion guide and a single moderator lent consistency to the topics covered in each group and to the dynamics of each group.

**Discussion Guide Construction**

The questions included in the discussion guide were designed to provide insight into and address the specific aims of the study and thus answer the research question. The questions were also carefully crafted to protect the confidentiality of the nurse involved as well as prevent revelation of conduct subject to reporting under Texas mandatory reporting and Nursing Peer Review Statutes. Texas State Board of Nurses (BON) rules supersede any research protections because the researcher is a registered nurse in Texas and subject to the mandatory reporting rules. The revelation of conduct subject to reporting would have placed the investigator in a position requiring mandatory reporting of the nurse being interviewed. Questions were carefully constructed to solicit perspectives and responses using generalities and hypothetical questioning to prevent discovery of reportable conduct. The groups were prompted to discuss perceptions of the medication administration reporting experience and synergy was noted as participants shared similar and conflicting views. Conversations fostered rich discussions as each nurse revealed a new perspective.

Content validity of the interview guide was ensured through expert consultation. The value of each question in providing information to answer the study aims was substantiated through an independent evaluation of the discussion guide by nurse scholars in the area of
nursing error. These nurse scholars provided a critique of the methodology to ensure rigor of the scholarly work. These scholars in the area of nurse error and reporting also ensured no questions are structured in such a way as to prompt a nurse to speak about or reveal a personal error or conduct subject to reporting.

**Population and Sample**

The research setting was a large free-standing not-for-profit children’s hospital in a major medical center in the Southwestern United States. The study population consisted of all registered nurses (RNs) working on inpatient units in the study hospital. The study population was homogeneous with regard to basic characteristics: all registered nurses licensed in one state, working in the same organizational culture at the same hospital, and having chosen a career as a pediatric nurse. RN volunteers were solicited to participate in the study through a purposeful sample selection process. Recruitment was as a result of voluntary self-referral in response to internal hospital unit publication about the study. Criteria for inclusion included registered nurses working in the inpatient hospital nursing units. Inpatient units were selected because of the large numbers of medications administered as opposed to the smaller number of medications administered in outpatient or procedure areas of the hospital. Thus, the assumption was made that the experience of medication error was more likely on inpatient hospital units. Exclusion criteria included nurses not working in the inpatient nursing units.

The purposive sampling approach facilitated the investigation into pre-reporting behavior by enabling the researcher to identify and approach nurses who could most inform the study about this issue. (Ulin, Robinson, & Tolley, 2005). Volunteers were solicited
through advertisements on all inpatient units. This strategy assisted in gaining access to participants who could teach the most about the subject. By interviewing participants working in all inpatient settings, the investigator was able to identify human and environmental attributes that favor reporting and resolution of the pre-reporting phase and those human and environmental attributes that do not. Targeting all different units enriched study findings by validating common themes given the differences of the units selected. The inclusion of all hospital inpatient units served to represent the full range of lived experiences and behaviors relevant to the experience during the pre-reporting period of medication error reporting.

The PI attempted to form groups of six to eight participants in each group. The common approach is to create groups of a size between six and ten (Morgan, 1997). By filling each group with eight or nine participants, allowing for perhaps two to three no-shows, it was thought that the resulting group size would be within the desirable range, flexible enough to allow for full attendance or attrition. The actual experience was that it was impossible to predict the final resulting number in each group. The group sizes ranged from 2 to nine participants per group. Staffing needs on the units required several participants to pulled into staffing at the last minute resulting in an unpredictable group size.

Group composition was important. One goal of group composition is to gather homogeneous groups that will share a set of experiences and a common set of cultural norms. All nurses in the study were staff nurses, so no status differential will exist; however, there is a distinction often made between general care (floor) nurses and special or critical care nurses. The distinction can be based on several things, but common among them are
temperament, skill set, and the nature of the work. If this distinction were to prevent participants from being able to relate to the experiences described by their peers in the group, group participants may have been reluctant to be candid about the perceptions they share. If the nurses from critical care units and the nurses from general care units perceive themselves to be different, the participants might have focused on that differentiator instead of focusing on the experience in question. To achieve homogeneity, group composition was be segmented. The groups were divided into the following three categories or segments:

- General care nurses,
- Special care nurses, and
- Combination or Mix of nurses.

Morgan (1997) describes inclusion of a mixed-segment group in a study as an opportunity for the researcher to explore this phenomenon. During the group interactions, the discussions within the mixed-group may be inhibited, or new ideas could emerge.

Another aspect of group composition is familiarity of participants. Although a common practice is to form focus groups with members who do not know each other (Morgan, 1997), the nurses in this study often knew one another, even though they may not have worked together on the same unit. Although the researcher attempted to compose the groups of participants from differing units within that group segment of general or critical care, avoiding all acquaintances was impossible. In this particular research it was believed that allowing for acquaintances within groups would not prevent discussion of topics of interest to the researcher. Jato, van der Straten, Kumah & Tsitol (1994) describe a richness of
information and interactions shared by members of groups when group members are familiar with one another. This is indeed the phenomenon observed in this study.

One final consideration was the number of groups. Three groups were conducted for each of the three segments: general care, special care, and mixed. Convening only one group of each segment runs the risk of not knowing if perspectives shared within the group are due to a particular group composition or unique dynamic among members, and using two groups per segment is only a little more robust in that similar outcomes would probably confirm that group composition and dynamics were not at work (Morgan, 1997). Three groups per segment is a more reliable way to address the research question.

**Data Collection**

Structured group interviews were used to conduct the study. A structured discussion guide included a predetermined set of open-ended questions in a pre-set sequence. Although potentially less conversational, each group conversation flowed naturally and yet delivered consistency and focus on the topic of interest, minimized interviewer bias, and brought more organization to the data and thus capability for data analysis.

All participants participated in the group or group interview process. The discussion guide questions used by the moderator was developed to reflect the conceptual framework describing the complex interaction between the individual, organizational context, and the nature of the work of medication administration to children.

The researcher conducted each interview. Emotional reactions by the investigator to study questions were withheld so as not to indicate surprise, disapproval, disgust, or any bias in either direction. The study participants were encouraged to answer truthfully, without any
fear of being judged. Confidentiality of responses was emphasized. The types of qualitative research questions employed solicited responses relative to beliefs and experiences around medication error. In general, the structured, open-ended interview questions probed:

- General perceptions around error reporting;
- Feelings and emotions experienced when realizing one has made a medication error;
- Perceived barriers to reporting medication errors;
- Perceived motivators to report medication errors;

The structured interviews were conducted only after each subject offered written consent. The interviews took place around a round or rectangular table in a private, quiet conference room, and last approximately 60 minutes each. The conference rooms were geographically separate from the patient care area to reduce any perceived anxiety related to co-worker curiosity. Interview times were not be scheduled sequentially or overlapped in any way so nurses did not see one another participating in the study, other than members of the same group. The groups were audio taped, transcribed, coded, and analyzed for emergent themes. Two recording set-ups were used in each group to provide a back-up recording in case of one system failure. The researcher served in the capacity of interviewer and moderator of the session, and a scribe served as note-taker to capture group behavior missed in audio recording such as a glance, tone, or other body language.

Demographic data was obtained from participants as they were settling in before the interview began. Basic social and work-related demographics were compiled:

a) Age
b) Gender

c) Highest educational level

d) Highest nursing degree

e) Certification status – if yes, what sub-specialty

f) Years in nursing

g) Years in pediatric nursing

h) Years working at this hospital

i) Unit/Department

j) Ethnicity

k) Ever made a medication error yourself?

l) Ever made a mistake or near miss (error that was caught before reaching the patient) yourself?

m) Ever consider reporting a medication error?

n) Ever consider not reporting a medication error?

**Researcher Bias / Respondent Bias**

The group interview format served as an ideal format in which to capture participant perspectives and lived experiences. Much could be lost in the telling if participants merely checked answers on a survey or wrote short answers onto a survey. Emotions and nuances of body language would also be lost in the translation of type-written responses. It was also selected over the in-depth interview because it was believed groups would enable a true synergy to develop that would reveal rich results because of shared ideas that would trigger another and yet another observation by each member of the group.
The moderator attempted to create a climate of sincere interest in hearing participants’ beliefs about reporting. No nurse was forced to participate. Participants volunteered of their own free will. In order to minimize surprise at the type of questions being asked, and to minimize refusal to continue with the group interview once begun, the intent and scope of the group interview was made clear up-front to all participants through the recruiting and informed consent process.

Potential biases are acknowledged. Because the study recruited volunteers to participate, a self selection bias may be present in that those nurses who were reluctant to join a group or would be socially shy and reluctant to reveal feelings and emotions in a group may have self select out of the sample. Nurses naturally outspoken on the subject may have self selected themselves into the study. The respondents may have engaged in self-report bias or may even have lied if they began to feel embarrassed about answering sensitive questions. An individual may have chosen to remain quiet for fear of voicing an opinion or belief that may be perceived by the group as unethical or dishonest.

At no time did an individual dominate the conversation by doing most of the talking. Some degree of performance may be mixed in with natural discussion or the participants may have provide answers to questions in order to appear competent or insightful to the moderator. The participant may even be reluctant to admit to the moderator that they or any nurse would even think about not reporting a medication error. All of these possibilities are acknowledged and have been considered in the analysis of the processes and structure of the conversations within the groups.
Data Management

Verbatim group interview transcription was performed by a single qualified typist in an attempt to capture the most faithful reproduction of the conversations. Quality assurance checks included regular comparison by the researcher of audio taped files with typed files deeming the qualitative data collected to be trustworthy.

Field notes were maintained by the researcher and were aligned with the respective group interview content immediately after the playback of the audio digital recorder and then transcribed to the electronic typed group interview files. Field notes and transcriptions were reviewed to help improve moderation of subsequent group interviews.

No names were collected other than on informed consent documents. All materials and documents related to the study including the individual signed informed consents and field notes were maintained in locked files in an organized, easily retrievable manner. Electronic transcripts, demographic spreadsheets, and an ATLAST.ti database was maintained on the primary investigator’s personal laptop and maintained in a locked file in the locked personal home of the researcher.

Data Analysis

Descriptive analysis of demographic data was facilitated by creation of spreadsheets using Microsoft Excel 2003 and utilization of the PASW Statistics 18 (Release 18.0.0) statistical package. Select demographics were used to describe the sample.

The qualitative analysis included a review of each session recording immediately following each session. This level of analysis will focus on verbal and non-verbal aspects of individual communication and group interaction dynamics. Notes were recorded about group
dynamics in each group such as who talked, whether a particular participant led conversations or pushed ideas out for group attention and then others followed. The general flow of ideas was noted. This level of analysis also included an assessment of the amount of energy generated around certain topics and whether many participants mentioned a topic or only one. An immediate review of recorded notes was compared to the audio recording so they could later be aligned with the transcription. A subsequent level of analysis involved reading of the transcripts, coding, identification of emerging themes, and display and interpretation of the data. Group-to-group validation was included to analyze similarity of perspectives across all topics and groups.

**Protection and Consent of Participants**

Before any data was collected, approval to conduct the study was secured from the respective hospital review board, from the University of Texas Committee for the Protection of Human Subjects, as well as from the Baylor College of Medicine Institutional Review Board (IRB).

**Recruitment**

Once the inpatient nursing units were identified, participants were recruited from those units. Advertisements were posted in the units. Nurses interested in participating were advised to contact the researcher. The researcher described the study verbally and answered any questions. The researcher explained the following to each participant:

- The goals and specific aims of the study.
- The fact that the researcher is chair of the hospital-based Nursing Peer Review Committee.
The risks inherent in the study, which include the slight risk of the participant’s identity being revealed and the risk of the nurse revealing conduct subject to reporting; minimized by the structure of the questions.

The participant’s identify will only be known to the moderator (a student researcher) and the participant’s name will not be recorded anywhere other than on the informed consent document.

The participant will be known only as participant #1, #2, and so-on (seats are numbered around the table), and their demographic information and study answers will only be shared in aggregate for the purpose of learning about the themes around medication error reporting.

The participant name will never appear in any published work or be revealed to another person.

The offer of a resource (counseling / emotional support) through the hospital-based employee assistance service will be offered if the nurse experiences uncomfortable emotions over what is discussed in the group interview.

On the digital audio recording, each participant will be referred to as participant #1, #2, etc. according to seat selection, and never referred to by name.

It is possible the nurse may be identified by voice, but this is highly unlikely. After the digital recordings are transcribed, they will be erased.
The benefit to them as a participant will be described as no direct benefit, although the nurse’s participation may benefit the community of nurses in the future because of the knowledge gained through their willingness to share.

If the candidate remained interested, the researcher offered the times and dates for the groups. Written informed consent was obtained from each participant according to Baylor and University of Texas - Houston policies, and will be maintained in a locked file for three years, but separate from study material. For this study, participation was totally voluntary, avoiding the perception of coercion.

**Risks and Benefits**

It was expected that emotions could be re-lived when describing beliefs about medication error reporting. If this occurred, there could be emotional or psychological risk if questions cause emotional upset. At no time did there appear any evidence of emotional upset. Participants could have stopped the group interview at any point. Participants would have been offered the opportunity to seek counseling from the free hospital-based employee assistance program if they experienced discomfort from the emotions that surfaced in the groups, but this needed never presented itself.

It was also anticipated that participants could perceive an emotional risk if they became upset thinking about the risk of a breach of confidentiality or release of confidential participant responses. This possibility was minimized because the researcher maintained the confidential records in a locked file cabinet in a personal office which also locks. No personal participant information will be maintained other than their signature on the informed consent document. Electronic transcription was performed by a third party who received no
personal information about the participants. Individual responses to questions will not be included in the final literary product and only information aggregated across all participants will be published in the academic paper. No perception of worry over this risk was noted.

There could also have been emotional or psychological risk if participants began to think of legal prosecution or threat to their license by the State Board of Nursing (BON). This is a potential emotional risk because only hypothetical medication errors were referred to during the group interview. Participants were reminded that the researcher was not gathering details around specific medication errors or any patient information. However, the limits of confidentiality were discussed. Participants may begin to feel that they are revealing potentially damaging information to their reputation and license if the information should be disclosed by the researcher or other group participants and linked to them personally. Each group was asked to hold all information shared within the group as confidential in order to create a safe environment to hold these candid conversations. The moderator also asked participants not to mention each other or anyone outside the group by name. If this had inadvertently happened, the researcher would have delete the name from the record so no name of participants, other employees, or former employees will be recorded, stored, or published. This action was not required.

Study participants could have felt fearful if nurses became aware during the group interview or afterwards that the researcher is the chair of the hospital nursing peer review committee. For this reason and because it should not appear that the researcher had any hidden agendas, the fact that the researcher is chair of the hospital-based nursing peer review committee was stated verbally during the initial discussions with interested nurses, and was
written into the informed consent document. It is possible that this fact may have influenced some to not participate because they did not trust that confidentiality will be maintained. It is unknown if this occurred.

Confidentiality of the information obtained was maintained to the best of the researcher’s ability. The names of the nurse participants were not solicited or written down. No record other than informed consent documents, have been kept of the nurse participants’ identities. Efforts were taken to minimize the likelihood that any data can be tied to the identity of any participant. Appropriate safeguards include the use of a single researcher taking every precaution to preserve privacy and confidentiality of the data. The digital voice file was destroyed after transcription and analysis of the data. Data was stored securely in locked file cabinets inside a locked office. If security is breached and if someone really analyzed the demographics collected, someone could conceivably identify a participant, although this is highly unlikely. Access to data is limited to the researcher. The researcher also shared demographics and themes that emerged from the group interviews with the researcher’s dissertation advisory committee members to assist with data analysis.

It was emphasized with participants that data was not being collected specific to any medication errors, but instead focused on the dilemma that surrounds the decision to report the medication event. Questions were posed in a hypothetical manner or in generalization and even when asking the participant about feelings they believed are experienced by nurses in general when considering to report, involved nurses were neither identified nor were details around the event in question solicited. These steps should protect the confidentiality of the
participant as well as protect the researcher from being exposed to nurse conduct subject to reporting.

No benefits were anticipated unless the process of introspection and recollection contributes to learning for an individual participant. In this case, the participant may benefit from the cognitive processing and learning that took place while engaged in dialogue about reporting medication errors. Otherwise, no direct benefit was expected for study participants.

Information gained from this study may benefit nurses, and by extension patients, in the future because of the study’s contribution to the body of knowledge around medication error reporting. The study posed minimal risk to participants. Potential benefits outweighed potential risks.
RESULTS

Demographic Findings

Fifty-four registered nurses from a large private not-for-profit children’s hospital in the southwestern United States enrolled and participated in nine group interviews during the period August to October, 2010. These nine groups were subdivided into three sub groups: one sub group (three of the nine groups) contained general care unit nurses, one sub group (three of the nine groups) contained critical or special care unit nurses, and the final sub group (three of the nine groups) contained a mixture of general and special care nurses. The number of nurses participating in each category was 14 in the general care category, 20 in the special care category, and 20 in the mix category.

Nurses participating in the sample varied in age from 23 to 61 years with a mean age of 39.8 years. The general care nurse age range was 25 to 56 years, the special care nurse age range was 24 to 59 years, and the mix nurse age range was 23 to 61 years. All participants were female except two males. See Table 1 for a display of demographic variable frequencies.
Table 1: Demographic Findings

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>3.7%</td>
</tr>
<tr>
<td>Female</td>
<td>52</td>
<td>96.3%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 - 29 Years</td>
<td>12</td>
<td>22.2%</td>
</tr>
<tr>
<td>30 - 39 Years</td>
<td>15</td>
<td>27.7%</td>
</tr>
<tr>
<td>40 - 49 Years</td>
<td>13</td>
<td>24.1%</td>
</tr>
<tr>
<td>50 - 59 Years</td>
<td>13</td>
<td>24.1%</td>
</tr>
<tr>
<td>≥60 Years</td>
<td>1</td>
<td>1.9%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>30</td>
<td>55.5%</td>
</tr>
<tr>
<td>African American</td>
<td>9</td>
<td>16.7%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>7</td>
<td>13.0%</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>8</td>
<td>14.8%</td>
</tr>
<tr>
<td><strong>Educational Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma Prepared Nurse</td>
<td>1</td>
<td>1.9%</td>
</tr>
<tr>
<td>Associate Nurse (2 Yrs)</td>
<td>5</td>
<td>9.3%</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>36</td>
<td>66.6%</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>12</td>
<td>22.2%</td>
</tr>
<tr>
<td><strong>Nurse Category</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Care Nurse</td>
<td>14</td>
<td>26.0%</td>
</tr>
<tr>
<td>Special Care Nurse</td>
<td>20</td>
<td>37.0%</td>
</tr>
<tr>
<td>General &amp; Special Care Nurse</td>
<td>20</td>
<td>37.0%</td>
</tr>
</tbody>
</table>

No difference was discovered across sub groups on either education level or certification. Most participants held a baccalaureate degree. Of the total sample, 1.9 % (1) held a Diploma, 9.3% (5) held an Associate Degree, 66.6% (36) held a Baccalaureate Degree, and 22.2% (12) held a Master’s Degree. A Chi-Square test was performed using the baccalaureate and master’s degree categories and no significant difference was found among the three sub groups on education level. Of the 54 participants, 33 held specialty
certifications. A Chi-Square test revealed no significant difference among sub groups with regard to certification.

Average age and years of experience for the total sample are depicted in Table 2. For the total sample, the mean number of years in nursing as a registered nurse was 15.1, the mean number of years working in pediatrics was 13.7, and the mean number of years working at this hospital was 11.1.

Table 2: Age and Years of Experience

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>S.D.</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Years</td>
<td>39.8</td>
<td>39.5</td>
<td>11.4</td>
<td>(23.0 - 61.0)</td>
</tr>
<tr>
<td>Years as RN</td>
<td>15.1</td>
<td>15.0</td>
<td>10.4</td>
<td>(1.0 - 35.0)</td>
</tr>
<tr>
<td>Years in Pediatrics</td>
<td>13.7</td>
<td>12.0</td>
<td>9.7</td>
<td>(0.8 - 34.0)</td>
</tr>
<tr>
<td>Years at Hospital</td>
<td>11.1</td>
<td>10.0</td>
<td>7.6</td>
<td>(0.8 - 28.0)</td>
</tr>
</tbody>
</table>

A Oneway ANOVA was performed on each of the years of experience variables (years in nursing, years in pediatrics, and years at this hospital) by sub group. A significant difference was noted between sub groups on the variable ‘years in pediatrics’. A Bonferroni test of multiple comparisons revealed the general care nurse sub group differed significantly from the special care sub group on ‘years in pediatrics’ with a mean difference score of 9.3179 and Standard Error 3.1878 at the 0.05 level of significance. The general care sub group nurses in this study collectively represented 18.543 mean years in pediatrics, the special care sub group nurses represented 9.225 mean years working in pediatrics, and the mix sub group represented 13.739 mean years in pediatrics. The general care sub group nurses worked in pediatrics on average 9 years longer than the special care sub group.
Nurse age was collapsed into groupings of those nurses < 40 years of age (n=27) and nurses >= 40 years of age (n=27). A Chi-Square test was used to compare these two age categories to the three sub group categories of general care, special care, and mix. A significant difference was noted between the general and special sub group categories when age is < 40 or >= to 40 years. The number of nurses in the general care sub group falling into the older age category was significantly greater than the number of older nurses in the special care sub group (Tables 3 and 4).

Table 3: Distribution by Sub Group When Age <40 or >=40

<table>
<thead>
<tr>
<th>Category</th>
<th>General Care</th>
<th>Special Care</th>
<th>Mix</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 40 years</td>
<td>4</td>
<td>15</td>
<td>8</td>
<td>27</td>
</tr>
<tr>
<td>&gt;= 40 years</td>
<td>10</td>
<td>5</td>
<td>12</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>20</td>
<td>20</td>
<td>54</td>
</tr>
</tbody>
</table>

Table 4: Chi-Square Statistic for Age

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>8.371(^a)</td>
<td>2</td>
<td>.015</td>
<td>* .017</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>8.694</td>
<td>2</td>
<td>.013</td>
<td>.017</td>
</tr>
<tr>
<td>Fisher’s Exact Test</td>
<td>8.263</td>
<td>2</td>
<td>.013</td>
<td>* .017</td>
</tr>
<tr>
<td>Linear-by-Linear Assoc</td>
<td>0.118(^b)</td>
<td>1</td>
<td>.731</td>
<td>.864</td>
</tr>
</tbody>
</table>

N of Valid Cases 54

- a. 0 cells (.0%) have expected count less than 5. Minimum expected count is 7.00
- b. The standard statistic is -.343.
Other data were collapsed into categories and Chi-Square tests performed with no significant differences noted except for years in pediatrics, already noted through analysis of variance.

Of the sample population, 61.1% (33 of 54) were certified in a specialty. Certification was not found to be associated with age, gender, educational level, ethnicity, years as a registered nurse, or years at the study hospital. Certification was, however, found to be associated with number of years working in pediatrics. For those certified in a specialty, their mean years in pediatrics was 15.867 and for those not certified in a specialty, their mean years working in pediatrics was 10.395. An independent samples t-test for equality of means revealed a significant difference in number of years working in pediatrics between those certified and not certified (two-tailed, mean difference 5.4714, SE difference 2.6371, p = 0.043, equal variances assumed).

Certification was found to be associated with number of years working in pediatrics and the general care sub group had a greater number of average years in pediatrics. Although this finding may suggest more general care nurses were certified, there was no significant difference on certification among the three subgroups. Applying a Chi-Square test, no significant difference was noted among general care, special care, and mix nurse sub groups with regard to certification. Of those 33 certified, their mean years working in pediatrics was 15.867; approximately 5.5 years longer on average than those not certified in this study sample population. However, these 33 certified nurses with their typically longer years of experience were equally distributed across the three sub groups in this study.
Of the 54 participants, 92.6% (50/54) reported they had made a medication error themselves and 98.1% (53/54) reported making a medication mistake that was caught before reaching the patient. Among the participants, 94.4% (51/54) indicated they had considered reporting a medication error/mistake they had made, and 63% (34/54) indicated they had considered not reporting an error/mistake they had made.

Possible relationships were explored between the variable ‘consideration to not report a medication error’ and variables of sub group category, age, education level, certification, ethnicity, years in nursing, years in pediatrics, and years at the study hospital; with no resulting significance.

To summarize the demographic findings, 54 registered nurses participated in this qualitative study during the period of August to October 2010. The mean age of the study nurses was 39.8 years. The majority of the nurses were female (96.3%), with only two male nurses participating. The mean years of RN experience was 15.1. The majority (55.5%) of nurses were Caucasian and the majority held baccalaureate degrees (66.6%). The mean number of years these nurses had worked at the study hospital was 11.1. The vast majority of the study participants had made a medication error (92.6%) or a medication mistake which was caught before reaching the patient (98.1%) themselves. The majority of nurses (63%) in the study had considered not reporting medication errors/mistakes. The nurses participated in nine groups divided into three sub groups: one sub group (three of the nine groups) contained general care unit nurses, one sub group (three of the nine groups) contained critical or special care unit nurses, and the final sub group (three of the nine groups) contained a mixture of general and special care nurses. The composition of the groups was similar. The sub groups
differed significantly on only two variables. If age is collapsed into two categories of ages $\geq 40$ and $< 40$ years, it was noted that the special care sub group nurses were younger than the nurses in the acute care sub group. A significant difference was also noted between the general care and special care sub group nurses with regard to years worked in pediatrics. General care nurses had worked in pediatrics on average 9 years longer than the special care sub group.

**Interview Findings**

The findings in this study revealed a two-phased response to the realization of making a medication error. The first phase was brief and almost reflexive in nature and involved an immediate physiologic and emotional reaction to the realization of committing the error. The immediate phase was described by nurses in this study as involving some degree of shock, disbelief, fear, anxiety, anger, bewilderment, and a sense of devastation. This emotion was accompanied by physiologic responses including increased heart rate, pounding in the chest, perspiration, nausea, and a sinking feeling. In each of the nine study groups, participants stated that the nurse’s initial concern was for their patient. The nurse’s first thought was whether the patient was okay or had been harmed. Participants acknowledged that for some nurses there is no question but to report at this time without regard to the consequence for that nurse. Comments, however, validated many nurses experience a wide range of considerations in the pre-reporting period.

The second phase was a result of the thought process that ensued. This cognitive processing of the personal meaning, implications and possible consequences of reporting the
error gave rise to multiple physical, emotional, and psychological tensions characterizing the second phase. As a result of coding and analysis of the data, the following four themes emerged as influential during this second phase in contributing to the nurse’s likelihood to report a medication error: the nurse’s response to a culture of blame, the desire to do no harm, a focus on self-preservation, and the reaction to the process of reporting an error.

**Response to a Culture of Blame**

The study nurses indicated a nurse needs to feel safe to report, but described the pre-reporting period as characterized by fear of disciplinary action and punitive action against the nurse. They suggested that reporting depends on the culture and manager of the unit. The nurse was described as more likely to report in a culture where frank discussion and learning from error was the norm; however, it was less likely that a nurse would report if he or she expected to be punished for the error. Although the nurses in this study believed process improvement to be a primary driver for reporting, these nurses believed that for nurses in general, the immediate realities and risks often outweigh the long term benefits of reporting.

One participant mentioned that reporting meant automatic disciplinary action, “For me, medication reporting is synonymous to disciplinary action.” (Nurse 5, G1).

The groups shared a list of several fears around reporting. They related a universal fear of whether the nurse might get into trouble. One nurse described consideration given to reporting as, “I guess you kind of balance it out. Is it worth me getting in trouble over it if there’s really nothing that came out of the medication error?” (Nurse 3, G9). The participants described a fear of disciplinary action, and a fear of blame and accusation by the manager: “I think if the staff knows that there will be less or no punitive actions then they are more likely
to report it” (Nurse 8, G8). They also feared legal action, losing one’s job, license, career, and even livelihood. One nurse observed, “I think that’s one big thing that nurses also fear, yeah, for your license. You get several write-ups and you might lose your job” (Nurse 2, G4).

These nurses also emphasized that managers were key. Participants stressed that a manager’s response to a medication error would influence the nurse’s likelihood to report future errors. If a manager’s approach was punitive or blaming, the nurse was less likely to report. If a manager’s approach was supportive and focused on factors that may have contributed to the event, a nurse was more likely to report. One nurse commented,

“I think what’s important for the manager is be available to the staff, because if they’re visible and the staff know they can talk to them, they can approach them, they will cut the barrier of being able to talk to them about things. Because if they’re not available, they’re not going to go to them, they’re not going to report.”

(Nurse 4, G1).

Although nurses in the groups acknowledged that individual nurses must be accountable for the action or inaction they personally contribute to an error, these nurses did not want the manager to place additional blame or react in an accusatory manner. For example, one nurse stated,

“We’re all human. We all get up and put our clothes on the same way. I think someone said earlier, we don’t start our day looking to commit a mistake of any type. And so when something happens, it absolutely was not intentional and we shouldn’t necessarily be punished for it. I think there are some times when there are issues with performance or behaviors, but I think those are the exception to the rule, by far, in terms of what nurses are faced with everyday in their world. So if they could say to their manager, “I really messed this up. What do I need to do?” And not feel like they were going to get talked bad to or yelled at or something really ugly happening to them where they would-they might speak up.” (Nurse 4, G7).
A response to punitive culture and authority, and an unexpected finding, was the description provided of a buddy system in which nurses watched out for each other. One nurse called this a “culture under a culture” (Nurse 2, FG1). This nurse continued by saying, “I think one point that you don’t often see in literature or anything when you read about error is the subculture that we talked about and the way that nurses fix nursing error and support each other in that process.” (Nurse 2, G1). In one scenario, nurses who know one another cover for each other and do not report one another. Reasons offered for this protectiveness included knowing this nurse was a seasoned nurse, had perhaps worked in this hospital for many years, was competent, and being convinced that something unusual must have happened to contribute to or cause the seasoned nurse to make the error. Nurses did not want to get each other in trouble. They did not want to be seen as ratting others out and wanted to protect one another and the profession.

Desire to Do No Harm

Nurses in the study reported struggling with an expectation to be perfect. One nurse described being conditioned through training and on-the-job expectations to be perfect and to believe that error was wrong and almost a neglect of a nurse’s duty to the patient. She explained,

“You’re supposed to be leading them towards recovery, getting out of the hospital and whatnot. And then if you do something, that just makes you feel horrible: I’m prolonging their hospital stay, or I’m costing them more money, because all these drugs cost money.” (Nurse 1, G4).

Another nurse described nurses as being under time pressure to get many things done during the course of a shift, with high expectations: “I think we’re under the gun so much to
meet schedule deadlines and so many other things that we have to do throughout the course of a shift… our expectation is that we do everything perfectly.” (Nurse 1, G8). In coping with the issue of wanting to be perfect, the introspection and self-talk can cause psychological, emotional, and physical distress for the nurse. Guilt, embarrassment, fear, crying, sleeplessness, anger, shame, feeling bad, stomach upset, and stress or anxiety were all described by participants. One nurse offered: “I think my initial reaction is just anxiety. My heart would pound. I would sweat. And part of it came from shame. Part of it came from fear, but my bottom line—my gut—says, ‘What did I do to my patient?’ That's what makes me—what turns my stomach.” (Nurse 1, G3).

Self doubt and questioning one’s own competence were described as well as beating oneself up and anger toward oneself. The nurses described the anger being related to disbelief, because the nurse would be angry that he or she could make such an error and place a patient in danger. The nurses described self-chastisement and self deprecating thoughts trying to process the shock and disbelief that they could have been so careless. They described shaken self-confidence, loss of self-esteem, and searching for answers as the nurse tries to reconcile his or her own imperfections and guilt. The nurses used the terms ‘self-torture’ and ‘self-deprecating remarks’ and offered examples such as, “How could I have been so stupid to make a mistake? What was I thinking? Should I be at this job giving dangerous drugs?” (Nurse 5, G9); “Oh my gosh. Am I not supposed to be a nurse?” (Nurse 6, G1), and “I can’t believe I did it. That was so stupid. That was dumb. I didn’t double-check. I’m always careful.” (Nurse 4, G7). Additional self-chastising remarks offered included, “I would feel like everybody’s going to think I’m stupid. What’s everybody going
to think of how lame this was that I did that? Everybody is going to know.” (Nurse 2, G5).

One nurse noted that,

“…driving home is when you can let it all out, and there's been times where I've personally cried, just from the frustration, the anxiety, just the whole realization of it, calling back that night. Seeing how he's doing, you know? How's he doing? This and that. Just because it's--you're just trying to do good and then whenever you do something bad, it's like, that was not what I'm here for!” (Nurse 2, G3).

Nurses reported a struggle with not wanting to make mistakes and trying to be very careful in a busy and often chaotic environment. They believed their mission was to heal and do no harm. One nurse stated, “I don't want anyone to look at me as imperfection, even though I know I am.” (Nurse 3, G3).

**Focus on Self-Preservation**

Nurses in the study groups described the pre-reporting period as full of rationalizations or self-talk to minimize the severity and significance of the error in their mind. They described wondering to themselves, ‘How severe is the error?’, ‘How significant is the error?’, and ‘Was the patient harmed?’ They related that some nurses believe that if the nurse can fix the error, if the error wasn’t a ‘huge’ mistake, if the error only caused a short delay in care, or if the patient was not harmed, then they conclude a report is not necessary.

One nurse described a common reaction as, “Oh, well there was no harm done, so why do we have to report it?” (Nurse 5, G7). If a peer or a physician comments, ‘it’s okay’, a nurse might also take this as permission to simply move on with his or her day and not report, free him or herself up from the worry, and feel better as a result. The participants stated that this all takes place in a nurse’s mind to help the nurse feel better. One nurse commented,
“Justification from your peers can go a long way. Even though you know, deep down, it was wrong—that what happened was wrong—justification from your peer can just let you off the hook.” (Nurse 4, G8).

Another way nurses help themselves reconcile their perceived unthinkable behavior is by placing blame onto others. Some participants described working within a culture where the nurse takes the blame for the medication error when the nurse actually believes there may be several people and factors that contributed to the actual occurrence. As a result, some nurses feel anger directed toward peers and other individuals like pharmacists and physicians who may have contributed to the error in some other part of the process. The participants described this as a way to take some of the blame off of themselves to protect their self-esteem. For example, a participant noted:

“I was devastated and scared and all that, but then on top there was anger because it was ordered wrong by a resident, not caught by pharmacy, dispensed wrong, and there it was. So then you’re angry, and that’s just to try to diffuse some of the guilt because you feel awful. I mean, you just feel stupid and just scared. You don’t want your colleagues to look at you like, ‘Oh my gosh. I can’t believe she did that.’” (Nurse 6, G1).

Another attempt to preserve self esteem and dignity was sometimes referred to ‘saving face’. Study nurses reported worrying about the physician’s reaction and possible loss of respect. Nurses reported a fear that the family’s reaction may include a loss of trust in the nurse: “I think maybe you feel some anxiety, too. You have to let the parents know, especially if you’ve formed a kind of bond there. You feel like maybe they won’t trust you as much” (Nurse 1, G5). They also reported a fear around a reaction by peers which may include questioning the competence of the nurse who made the error. According to these groups, this
desire to preserve self-esteem contributed to a nurse’s reluctance to report. For example, “And not only like you beating up yourself, but like, what are my colleagues going to think about me? They're going to think I'm careless… you always want to live up to that number one--you know, I'm very good at what I do, this is me.” (Nurse 3, G3).

**Reaction to the Process of Reporting an Error**

One aspect of an effective reporting system involves knowing what and when to report. Nurses voiced confusion about when to report an error. One nurse offered, “I would say that a lot of people don’t know that definition-don’t know. It’s not clearly defined when it needs to be reported. Absolutely, I think there’s a lot of gray there.” (Nurse 2, G5).

Some nurses stated that a nurse should report everything. Some described knowing they should report errors that reach the patient and even near misses that almost reach the patient; but without the time to do so, they choose not to report. Participants reported no rule in policy about when and what to report. Study nurses believed that some nurses took the initiative to report and others checked in with a manager or charge nurse for direction. One nurse commented that for newly hired nurses, if their preceptor does not mention error reporting, this gives the new nurse permission to not report an error or to think it is not a big deal; further validating for the new employee the perception of fear surrounding reporting.

Another aspect of an effective reporting system involves reporting procedures. Participants described the physical act of event reporting as long and cumbersome and believed the act of reporting should be confidential and private. There is reportedly little time during a shift to complete the report which nurses consistently mentioned took 15-20 minutes to complete. One nurse explained,
“When I think about event reporting, I think of this long process of sitting down at the computer, having to do it at the end of the day when you're really tired. You want to go home because you're so tired, and yet, you have to sit down and fill out this long process of reporting. That's what I think of. Because it's really difficult to do it in the midst of patient care, because you get interrupted, and then, of course, you worry about people looking at the screen. You have to lock up. You might lose your data; that type of information.” (Nurse 1, G3).

These nurses also described greater likelihood of reporting when data and trends are shared openly with staff nurses actively engaged in discussion. Study nurses suggested that lessons learned from errors as well as near misses should be a part of the regular agenda in staff meetings so that it is talked about at every staff meeting. The participants also suggested that nurses should receive feedback on trends and actions being taken, when latent errors in the system get fixed as a result of nurse reporting, and when teams of physicians, nurses, and pharmacists collaborate on investigating and fixing problems together and acknowledge each other’s contribution to an error. One nurse commented,

“You know, I think another thing that might encourage nurses to report would also be if there’s a circle back so that if that nurse felt like she’s going to report that, and then she’s going to get feedback about how that information was used to change a process or something like that—that you as a nurse would feel so good that you were a part of the process of making something safer.” (Nurse 4, G6).

Another states, “I think people are more likely to report if we were in a system where if they think a process change will come about to make the error less likely to happen for someone else in the future.” (Nurse 3, G7).
DISCUSSION

The immediate and universal concern of nurses in each group was concern for the patient’s safety. The severity of the error and consequence to patient’s safety weighed first and foremost on the mind of a nurse. Reporting was more likely if there is harm or potential harm to the patient, if the physician needed to be informed, if further treatment was required as a result of the error, and if someone was likely to discover the error. A nurse was less likely to report an error if there is no patient harm.

It was evident from the data that some nurses may report immediately, but nurses in this study also described many additional factors that contributed to a decision to report or not to report. Of the remaining factors identified that might make it more or less likely for a nurse to report, most were opposite extremes of the same four themes noted in the findings. The following four themes that emerged as impacting the likelihood of a nurse to report a medication error will be discussed further: response to a culture of blame, the desire to do no harm, a focus on self-preservation, and the reaction to the process of reporting an error.

Response to a Culture of Blame

Van Dyck (2005) and Rogerson (2004) concluded that in a culture in which nurses are blamed for errors and experience a punitive response to reporting error, the nurse may perceive a sense of threat, fear, and danger and may need a way to cope with the negative self-image that results. This may lead to a cover-up or reluctance to report and placing blame on others. Smith & Forster (2000) stated that as long as there is a threat of disciplinary action, a threat to licensure and possible legal action, the desire to increase reporting in order to learn from error will not succeed.
Many different emotions and fears were articulated by the nurses in the groups. The emotions included regret, guilt, fear, panic, agony, humiliation, and sadness; all of which emerged upon realization of making an error. The fear of discipline and the fear of getting into trouble were mentioned by all groups. Nurses also described concern in the pre-reporting period that if nurses were to report their error, they could lose their job, license, or livelihood. These reactions are all evident in current literature (Blegan et al, 2007; Wu, Folkman, McPhee & Lo, 1991; and Zeelenberg, Beattie, van der Plight & de Vies, 1996).

Physiologic symptoms were also reported to accompany the realization of making a medication error. They included increased heart rate, the heart pounding in the chest, perspiration, and nausea. Similar reports of physiologic response to the realization of making a medication error can be found in the research of Crigger & Meek (2007).

The subculture of a buddy system in which nurses are protective of one another was described in study results. It was apparent that some nurses cover for one another to intercept the error to prevent or minimize consequences to the patient. This behavior also served to prevent a co-worker from getting into trouble or perhaps to avoid having to report a friend and co-worker.

The act of blaming a person for a medical error has a long history in healthcare. Because of the experience of blame being placed on the individual nurse, nurses still today operate under the belief that acknowledging personal responsibility may lead to greater punishment. The fundamental attribution bias was described by Locke & Pennington (1982) as a natural human tendency to blame a person for a bad outcome and to overlook other contributing factors. The research of Jellison & Green, (1981) revealed that a person actually
received greater social approval when a person expressed personal responsibility for a bad outcome. This would suggest that accepting responsibility for an error should lead to less personal punishment and blame; however comments from participants as well as evidence from the literature (Van Dyck et al, 2005) suggest the fundamental attribution bias still exists in hospitals where managers and peers attribute blame to the nurses who admit to errors.

These findings are consistent with current literature that suggest hospitals adopt not a blame-free but an accountable culture. Marx (2001), for example, suggested that hospitals find a balance between the need to impose disciplinary action in an effort to deter future error, and the need to learn from mistakes which would make the medication delivery system safer. The challenge is to hold individuals accountable for wrong-doing, but not respond in a punitive manner.

Reason (2000) cautioned healthcare leaders to acknowledge two sources of medical error, human and system. His description of the high reliability organization was one that minimizes blame on any one person but investigates the holes in the current system that may have contributed to the error. He emphasized that even in high reliability organizations, error happen, but happens with minimal frequency with constant attention and vigilance to error prevention. Reason reminded us that 90% of error can be attributed to no one person and are true accidents with just the right set of contributing factors coming to bear on that one situation, much like a perfect storm or as the holes in the Swiss cheese line up just right to allow an error to occur. Reason underscored his recommendation that healthcare systems focus on the working conditions within which nurses work by using the analogy of a
mosquito breeding ground: a person can kill the mosquitoes one by one but until the standing water in which they breed is drained, the mosquito problem will still exist.

By sharing their collective lived experience in this study, these nurses have declared the importance of working in an environment that promotes learning from errors. The change in culture and the approach taken by the manager must come first. This would lessen the emotional and psychological burden required to cope with a negative self image, thus there would be less blaming and cover up of error, more reporting, more learning, and the cycle could be broken.

**Desire to Do No Harm**

Participants revealed a common struggle within a nurse who has made a medication error. The struggle is between the awareness that the nurse may have caused harm and the belief that the nurse should be perfect and never make a mistake. Leape (1994) described the nursing profession as having a long history of priding itself on healing and perfectionism. Nursing is also the most trusted profession according to consumers (Jones, 2010). These perceptions of being highly trusted, highly ethical with a focus on healing and perfection, make it difficult for the nurse to reconcile being a healer and having made a mistake and possibly harming his/her patient.

Participants in the study described how a nurse searches for an explanation to how he or she could have made such an error and how he or she can continue being a nurse after doing something ‘so stupid’. They described self-talk to minimize the significance of an error, trivialize it, and down-play the severity of the error even if there was harm to the patient. These behaviors are all congruent with Festinger’s theory of dissonance (1957).
In addition to a perception of being trained to be perfect and to never make mistakes, training on systems theory is also lacking. Nurses lack knowledge of the theory of system complexity (Smith, Cronenwett, & Sherwood, 2007). Taken together, this lack of knowledge around system complexity coupled with a desire to never make a mistake, nurses may develop an unrealistic expectation that they can go through their career and never make a mistake.

Models of error causation and error prevention emphasize human and system error, explaining we have imperfect humans prone to human error working in imperfect systems with latent error lying in wait for just the right circumstances to be revealed. The work of Perrow (1999) and Reason (1990) described health care delivery as a highly complex system with multiple hand-offs and error just waiting to happen. These authors explained how the Normal Accident Theory (NAT) serves to describe how error is inevitable in such complex systems. A process with 50 steps (medication administration has 40-60 steps) will be completed successfully with no errors on average only 61% of the time. And the High Reliability Organizational Theory (HROT) suggests an organization can achieve a very small risk of failure if that organization enhances a culture of safety and learns from errors and mistakes.

Because participants described that they are led early on to believe they are supposed to be perfect and cannot make mistakes, it is important that the theory of complex systems and error management and prevention be taught and be exemplified in hospitals in how we treat errors. The difference between the perceived ideal of nursing planted in nursing school and the reality of nursing within a larger more complex health care system, suggests we
should surface this reality and talk about it openly in hospitals and also in schools of nursing during entry level training. Curricula in entry level nursing programs should address approaches to quality, safety, and improvement in large and complex healthcare systems and should help the student explore their own beliefs about safety and collaboration in these systems. The theory and science around this phenomenon of complex systems and safety, especially medication safety, should be taught in fundamental curricula so that nurses can understand the evidence, anticipate the likely physical, psychological, and emotional reactions that occur, talk openly about them, and acknowledge them (Smith, Cronenwett, & Sherwood, 2007; Chenot & Daniel, 2010; Cronenwett, Sherwood, Barnsteiner, Disch, Johnson, Mitchell, et al., 2007).

This finding is important for educators and leaders in the service arena. If the likelihood of reporting errors is to improve, in addition to adding curricular elements around human and systems theory and around error causation and prevention, educators and nurse leaders in hospitals should evaluate the training and work environments of the nurse looking for what elements in those environments might contribute to a message that perfection is a desirable attribute or that mistakes are unforgivable and shameful. Managers and nurse educators should intervene when mistakes are made to evaluate how the student or nurse is processing the meaning of the event; taking the opportunity to reach out to the human being and to describe where the goal of perfection comes from and how it can fill a good nurse with unrealistic expectations.

Actions such as these would serve to demonstrate to nurses that nursing leaders recognize the complexity of the current health care environment and that systems are
imperfect. These actions would also acknowledge that nurse leaders understand the human side of error and that even the best nurses will eventually make an error. And these actions would communicate to nurses that hospital leaders recognize their own accountability for sharing the responsibility for error.

**Focus on Self-Preservation**

The theme of self-preservation falls directly on the heels of the theme of perfection and wanting to do no harm. As a result of the psychological tensions created by the struggle between perfection and committing an error as described above, the nurse exhibits behavior to cope with that struggle. The nurse attempts to regain self esteem and reduce the tension created by that struggle. Nurses in the study offered examples of how nurses search for ways to feel better about themselves. The behaviors described by the nurses fit the model of dissonance and dissonance reduction. Festinger (1957) first described cognitive dissonance as the psychological tension experienced when one struggles to reconcile what one has done and what one believes about oneself. This tension can be reduced to help the person feel better about him or herself. The cognitive tension can be reduced by: modifying one’s original opinion about oneself (in this case that one is perfect and cannot make mistakes); adding new beliefs or seeking new information to make the apparent inconsistency more acceptable (such as reminding oneself that it was a very busy assignment that day or that pharmacy is just as much to blame because they did not catch the error); or minimizing the importance of what one had done (for example minimizing the seriousness of the error).

The phenomenon of trivialization or attempts to reduce the significance of the error was described by several study group participants. This finding is consistent with current
knowledge of error reporting (Taylor et al, 2004). Dissonance reduction can take the form of blaming others, justification of the actions taken, and minimizing the harm that came to the patient. Several study nurses mentioned these justifications and described them as an attempt to make him or her feel better. Some nurses in the study reported that a nurse feels anger towards others and at the system for letting them down, and feels blame toward others who should share in the responsibility but often are perceived by the nurse to suffer no consequences for their part in the error. It is described by most in the study as an unknown as to whether a pharmacist or physician ever assume any responsibility for a medication error because the current system typically is focused on the nurse who administered the medication.

According to Crigger & Meek (2007), all attempts by the nurse to reduce the tension and torture, disbelief, blame, denial, and threats to self-esteem will continue if the nurse does not report the error. For many nurses this means rationalizing to convince oneself that there was minimal harm to the patient, minimizing the significance of the error, justifying that other factors contributed to the error, and blaming the system or others on the team will continue and the psychological tension will continue unless a nurse feels safe enough to report and talk about the error.

This is important information for the current study. To improve the likelihood that a nurse will report a medication error, nurses should be educated to understand what these behaviors represent. Nurses should understand that these behaviors are a part of a natural protective human reaction to use rationalizations to preserve a threatened self esteem. Nurses need to perceive less threat and fear so energy is not wasted on rationalizations, but is instead
directed in a meaningful way to address the investigation and the learning that can result. The nurse must be helped to face reality. This can be difficult if patient harm results from an error, but necessary and even more important when there is harm with which a nurse must come to terms. Professional counseling could be made available to nurses who experience difficulty coping with having made an error. The result is likely to include improved reporting rates as well as a healthy psychological resolution to the dissonance. Many nurses are only likely to readily disclose if they feel safe enough to do so. This requires a non-critical, non-accusatory, and fair-minded system.

**Reaction to the Process of Reporting an Error**

Nurses need clear expectations of what and when to report an event or near miss. Many nurses described that nurses should report everything from the near miss to the actual error that reaches the patient. Others described uncertainty whether all nurses know what to report. Some mentioned that error reporting takes too long and so near misses are not reported. Nurses in the special care and mix groups reported that some nurses check in with the charge nurse before reporting which may be related to the statistically significant number of younger, more inexperienced nurses in the special care sub group. Some nurses were uncertain if there was a policy and described reporting to be an individual decision by a nurse. Nurses would like to see physicians and pharmacists use the reporting system themselves.

Nurses suggested there may be greater reporting when the act of reporting is made easier and less time consuming and enabled to occur in a private location, with managers who offer assistance in completing event reports. These nurses also described greater
likelihood of reporting when data and trends are shared openly with staff nurses actively engaged in discussion, when nurses receive feedback on trends noted and actions being taken, when latent errors in the system get fixed as a result of nurse reporting, and when teams of physicians, nurses, and pharmacists collaborate on investigating and fixing problems together and acknowledge each other’s contribution to an error. These findings are consistent with reported results from the aviation industry (Tamuz & Thomas, 2006) and the contemporary work on ‘Just Culture’ by David Marx who reports that “In a culture where employees know that divulging their violation will educate others of the risk and that the data will be used to prevent future events, you will begin to see self-reporting of violations” (Marx, 2001, p. 26).

These nurses send a clear message. To improve the likelihood of reporting, hospitals should demonstrate to employees that information about the error is valued, information about error is used by the organization, that the organization will act on the information, demonstrate the organization will provide feedback to staff about actions being taken to address the issue, and that the organization values transparency and is not afraid to make changes to processes and even valued traditions that could have contributed to errors. These nurses asked for transparency; they asked that leaders share more data and let staff nurses look at the data and the trends. Participants explained that this will help nurses own the data, begin to ask what they can do about it, and will see it is not just them alone making these mistakes. In this way, a nurse’s contribution may become part of the culture of the unit.

In light of the research question around factors that will improve the likelihood of reporting, these nurses suggested hospitals look at the whole reporting process from start to
finish. They suggested clearly prescribing what and when to report, simplifying the reporting tool, and making the process private so reporting is the safe and easy thing to do. They encouraged all who participate in the process to report. They asked that leaders include nurses in all phases of reporting. Nurses should be involved in investigating contributing factors in the systems within which the nurses work, in data interpretation and analysis, in generating solutions, in feedback about actions taken to change processes improve processes, and in creating recognition to nurses for the good they do every day, celebrating near misses as good catches. In this way, nurses experience a culture that supports reporting and learning from error.

**Summary**

The research question, “What factors contribute to a nurse’s likelihood to report an error?” was answered with insights into many factors that may contribute to a nurse’s likelihood to report a medication error. The qualitative methods utilized in this study provided for effective implementation of group interviews. The interview questions fostered thoughtful exploration of factors surrounding the pre-reporting period.

The value of this study lies in the emergence of the four themes that influence the likelihood of reporting and in the discoveries that nurses place their first concern on patient safety, that nurses desire to learn from error, want to report, desire to be a part of the solution, value an environment in which all members of the healthcare team work together to investigate errors and acknowledge everyone’s contribution to error, and perceive managers as a powerful factor in whether nurses report or not.
The strength of this study lies in its use of the group interview and in having solicited the self-report of the lived experiences of these nurses. Group members experienced a synergistic effect generating ideas and feeding off one another in responding to questions as they explored the pre-reporting period.

**Study Limitations**

This study was conducted in one specialty hospital, and thus generalizability is limited. Nurses who participated in the study groups did so voluntarily and so a self selection bias may have been introduced if there was a similar characteristic all had in common that led them to volunteer for participation in the research.
CONCLUSION

The literature was sparse when looking for a description of what nurses experience in the pre-reporting period. This study was undertaken to describe and inform us of the pre-reporting experience of making a medication error from the perspective of the nurse. The research question was: What factors contribute to a nurse’s likelihood to report an error? From these findings, it was clear that the realization of making a medication error was a very stressful time for the nurse; and whether reporting occurred was related to many different factors.

The four themes that emerged in this study enlighten our knowledge of the issues nurses experience in the pre-reporting period. Some findings support current knowledge, and other findings offer fresh perspectives that can now be addressed by the industry. The theme of wanting to do no harm places perfection into a new light and clarifies the source of the nurse’s struggle with perfection. The theme around culture and authority is not new but draws new focus on how nurses react to error in a system that they believe unjustly responds to error. Finding a comrade who will do a favor in return for a favor would appear to be a natural coping mechanism but was not yet so clearly articulated in the literature. Protecting one self, protecting one another and protecting the profession is one way to maneuver within a system perceived as placing blame heavily on the nurse. Nurses’ lived experiences provided during the interviews, and their suggestions of what managers and leaders should and should not do, provide a richness of examples with which to begin addressing these issues. Elements within the theme of self-preservation such as minimizing the significance of the error, saving face, and placing anger and blame onto others have been addressed in the
literature but are now collectively identified as elements of a much larger theme of protecting one’s self esteem and should be addressed from that perspective. Elements of the theme around the process of reporting have also been addressed in the literature as barriers to reporting, but pulled together they broaden our knowledge of how nurses desire to work in a culture of transparency and accountability in which nurses are still held accountable for their contribution to error, but are also engaged in a collaborative reporting process including reporting, data interpretation, and feedback towards real solutions that make it less likely for the event to happen again.

Hospitals have an opportunity. Participants indicated by their comments that they were ready for a positive change and would like to engage and partner in making change happen. Nurses reported that if the identified issues were addressed, the nurse would feel more confident and safe; they would feel more supported by the culture and by managers and would be more likely to report. According to these nurses, there would be less fear of physician, peer, and family reaction; less worry about disciplinary action or loss of job and license; less need for the buddy system; less need for self-preservation, less embarrassment and shame, less weighing in on all aspects of whether to report or not, less self-deprecation, less focus on being perfect, and thus less cognitive waste of energy on trivializing and convincing of themselves that they are still good nurses. Clearly, when a medication error occurs, it is a very stressful time for the nurse; and whether reporting occurs or not, is related to many different factors.
**Future Research**

Future studies may include replication of this study in other settings, with different patient populations, in other areas of the country, in different hospital settings, and with nurses whose work environment involves different cultures of reporting and leadership styles to observe for differences in responses and reporting frequencies among different hospital settings. If it is possible to experimentally manipulate study groups, it would be interesting to evaluate the usefulness of providing clear guidelines for what and when to report in improving error reporting. In a similar way, it would be helpful to assess the usefulness of an intervention introducing improved error reporting tools to improve reporting frequencies. Another intervention could examine how using different manager styles might improve nurse perception of likelihood of reporting and actual improved frequency of reporting. Cohorts could be divided by units whose managers have distinctly different styles of intervention. By blinding the unit identities and matching the units on essential characteristics, one could compare the number of medication error reports to assess whether the opposite styles make a difference in reporting frequency as these participants suggest. The ethical soundness of this should be considered. A final suggestion would be a longitudinal research study to monitor and evaluate over time whether nurses are any more likely to report medication error as the result of any particular intervention.
APPENDICES

Appendix A: Group Discussion Guide

GROUP DISCUSSION GUIDE

NURSE LIKELIHOOD TO REPORT A PEDIATRIC MEDICATION ERROR: EXAMINATION OF THE “PRE-REPORTING” PERIOD OF ERROR REPORTING

These group interview questions are designed to solicit open-ended and detailed descriptive responses to questions about feelings and emotions surrounding commission and reporting of a medication error. There are five major sections to the discussion guide:

Opening question: - Non-threatening question focused on beliefs about contributing factors to medication errors in pediatrics.

Introductory question - Question beginning to focus on the topic by asking in a non-threatening way how likely participants think medication errors are reported.

Transition question – General question on thoughts and feelings that might run through a nurse’s mind when deciding to report an error.

Key Questions – Questions focus on reactions that may be experienced by a nurse after to making a medication error. Additional questions inquire about factors that might make it more or less likely for a nurse to report.

Transition to Closure – Questions thanking participants for the candid discussion about errors, for sharing emotions, and describing the factors that might make it more or less likely to report or not. Participants are asked if there is anything else they would like to add that we did not cover and what recommendations they would like to offer for nurses, managers, physicians, hospital leaders, and others.

The following guidelines should be followed:

- The flow of the group interview should be as conversational as possible given the structured group discussion format.
- The group moderator should be attentive and engaged, and use active listening techniques, and pauses during the group interview.
• The group moderator should be aware of and observant of the effect that their own presence and mannerisms have on the group interview process.

• Observations about the effect of self and the effect of participant behaviors should be noted in field notes immediately after each group interview while reviewing audio recording so as not to lose the nuances of behavior that may affect subsequent responses and flow of the group interview.

• Open ended questions are included so that the desired answer is not implied and to encourage descriptions by respondent.

• Conversational probes should be used to encourage participants to elaborate or dig deeper into a key subject. Probes that may be used include, but are not limited to, the following:
  
  o Would you explain further?
  o Can you give me an example?
  o Is there anything else?
  o Please describe what you mean?
  o I am not sure I understand.
  o Please go on.
  o Please tell me more about that.

OPENING

Housekeeping
  a. Completion of the demographic form
  b. Signing consent/ answering any questions.
  c. Researcher’s reasons for doing the study.
  d. Agreement to audio taping of the session.
  e. Comfort
  f. Reminder that what is shared in the group, stays in the group; that we all need to hold confidential all conversations in the room today in order to create a safe environment in which to hold these candid conversations.

1. Let’s get started by asking you to describe your thoughts about medication error reporting. Anything that comes to mind.

(addresses specific aim #1)

INTRODUCTORY QUESTION
2. Think about medication errors you just come across or discover or hear about. What percent of the time would you say medication errors are reported?

TRANSITION QUESTION

3. I’d like to focus on the experience of the nurse when he or she realizes he or she just made an error. What is going on inside of them?

(addresses specific aim #2)

KEY QUESTIONS

4. I want to focus even more on this experience of the nurse when he or she realizes he or she just made an error. In general, for all nurses, what else is the nurse experiencing?

(addresses specific aim #2)

TRANSITION TO CLOSURE

5. How do you know when an incident report is to be completed in this hospital?

6. What might prevent a nurse from reporting a medication error?

Probe: What other barriers to reporting can you think of?

(addresses specific aim #3)

7. What might make it more likely for a nurse to report a medication error?

Probe: What other motivating factors can you think of?

(addresses specific aim #4)

8. How many participants did you know in the discussion today?

If one or more, in what way did you think this influenced our conversation today?
We have really had a great candid discussion about errors and emotions and the internal dialogue nurses might experience about whether to report or not.

As we wrap up, I will say that that one ultimate goal is that nurses do report so that the nurse can learn from mistakes. We know that you can only learn from mistakes if you acknowledge and report them so they can be talked about. Another goal is to help us as nurses see we are not perfect. We do have a social ideal fostered by consumers that we are the most trusted and ethical profession.

But we are human, too, and we do and will make mistakes. We do not intend to make mistakes and prevent them from happening most of the time! But given the right circumstances, accidents and mistakes do happen. Once a mistake is made, we need to help every nurse deal with the psychological impact of making the error.

9. What recommendation would you have for nurses with regard to thinking through whether to report a medication error?

10. What recommendation do you have for managers?

11. What recommendation do you have for physicians?

12. What recommendation would you have for the hospital leaders?

13. Other recommendations?

I want to thank you for your openness and honesty in dealing with these questions.

Let’s take a moment to list what you all believe to be the most important points made today about likelihood to report. We may have spent twenty minutes on something you all found interesting. I may interpret that as your feeling it is important. However, it may have just been interesting. So, what are the most important points made today about a nurse’s likelihood to report a medication error?

14. Do you have any other suggestions or ideas we did not get to?

    Probe: Anything that you would like to add or get out into the open that I can include or investigate further to help nurses in these situations in the future?

Thank you..................
Appendix B: Certificate of Completion - Human Subjects Education

CITI Collaborative Institutional Training Initiative

Human Research Curriculum Completion Report
Printed on

Learner: Francine Kingston (username: fkingston)
Institution: University of Texas Health Science Center at Houston
Contact Information:
2114 Oceana Drive
Seabrook, TX 77586 USA
Department: MPACH
Phone: 832-824-2491
Email: ftkings@texaschildrens.org

Group 2:

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For this Completion Report to be valid, the learner listed above must be affiliated with a CITI participating institution. Falsified information and unauthorized use of the CITI course site is unethical, and may be considered scientific misconduct by your institution.

Paul Braunschweig, Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Course Coordinator

Return


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Appendix C: Informed Consent Document

CONSENT FORM
RN Focus Group Participant
Institutional Review Board for Baylor College of Medicine and Affiliated Hospitals

H-26987- NURSE LIKELIHOOD TO REPORT A PEDIATRIC MEDICATION ERROR:
EXAMINATION OF THE "PRE-REPORTING" PERIOD

Background
You are invited to take part in a research study. Please read this information and feel free to ask any questions before you agree to take part in the study.

Each year, hospitalized patients experience 1.5 million preventable injuries from medication errors and hospitals incur an additional $3.5 billion in cost (Aspden, Wolcott, Bootman, & Cronenwatt; (2007). It is believed that reporting medication errors is one way to learn about factors contributing to medication errors. And yet, an estimated 50% of medication errors go unreported. It is not well understood what contributes to the likelihood of a nurse to report a medication error once it is discovered. This period of medication error pre-reporting, with few exceptions, is under-explored. The literature focuses on error prevention and management, but lacks a description of the period of introspection and inner struggle over whether to report an error. From a better understanding of factors that contribute to or detract from the likelihood of an individual to report an error, interventions can be identified to help the nurse come to a psychologically healthy resolution and help increase reporting of error in order to learn from it; reducing the possibility of future similar error.

Purpose
This research is being conducted to explore the medication error experience from the perspective of the nurse, including nurse descriptions of the emotional, cognitive, and physical reactions to making a medication error, and including nurse explanations of pre-reporting conditions that make it more or less likely for a nurse to report a medication error.

Procedures
The research will be conducted at the following location(s): Baylor College of Medicine, TCH: Texas Children's Hospital.

You will be one of approximately 81 registered nurses to be asked to participate in this study.

You are being asked to participate because you are a registered nurse working on an inpatient unit at Texas Children's Hospital.

If you decide to participate, you will be part of a 60-90 minute focus group interview in a hospital conference room around a table with 5-8 other hospital nurses who are participants in the study. Questions will be posed by the researcher to solicit participant responses about the current medication error reporting system, the experience of the nurse upon realization that an error has been made, and perceptions about what things make it more or less likely for a nurse to report a medication error. You will not be identified by name. No questions about specific medication events will be asked.

A demographic form with no individual identifying information will also be completed by each nurse participant.
CONSENT FORM
RN Focus Group Participant
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H-26987- NURSE LIKELIHOOD TO REPORT A PEDIATRIC MEDICATION ERROR:
EXAMINATION OF THE "PRE-REPORTING" PERIOD

Potential Risks and Discomforts

You could become embarrassed or anxious about your responses. You could become anxious or upset worrying about release of your responses by other nurses on the focus group. You could worry about a threat to your nursing license. You could become worried that you are sharing reactions to making medication errors with the student researcher who also happens to be the chairman of the nursing peer review committee of the hospital.

If you experience uncomfortable emotions when describing beliefs about medication error reporting, you may request to stop participating in the focus group at any point. In order to minimize worry about the breach of confidentiality or release of confidential responses, you should know that the researcher will maintain the confidential records in a locked file cabinet in a locked personal office. No personal information about you will be kept other than your signature on the informed consent document. Your responses to questions will not be included in the final paper and only information compiled from all participants will be published in the school paper.

Because it is anticipated that there may be emotional or psychological risk if you begin worrying about legal prosecution or threat to your RN license by the Texas Board of Nurse Examiners, only hypothetical medication errors are referred to during the focus group interview. You will be reminded that the researcher is not gathering details around specific medication errors or any patient information. Each focus group will be asked to hold all information shared within the group as confidential in order to create a safe environment in which to hold these candid conversations. The moderator will also ask participants not to mention each other or anyone outside the focus group by name, and will state that if this happens, the researcher will delete the name from the record so no name of participants, other employees, or former employees will be recorded, stored, or published.

To minimize worry about the student researcher also being chair of the hospital nursing peer review committee, you should know that the researcher has no hidden agendas. It is possible that this fact may influence you to not participate because of worry that confidentiality will be not be maintained. However, every opportunity will be taken to ensure confidentiality for each participant. And participation or non-participation will in no way affect employment at the hospital.

Data is not being collected specific to any medication errors, but instead focuses on the dilemma that surrounds the decision to report the event. Questions are posed in a hypothetical manner or in generalization and even when asking you about feelings experienced by nurses in general when considering to report, you and other involved nurses are neither identified nor are details around the event in question solicited or pursued. These steps should protect your confidentiality as well as protect the researcher and other focus group participants from being exposed to nurse conduct subject to reporting.

Study staff will update you in a timely way on any new information that may affect your decision to stay in the study.

Approved from June 04, 2010 to May 18, 2011 Chair Initials: J. K.
H-26987- NURSE LIKELIHOOD TO REPORT A PEDIATRIC MEDICATION ERROR: EXAMINATION OF THE "PRE-REPORTING" PERIOD

Potential Benefits
The benefits of participating in this study may be: The participant may benefit from the cognitive processing, introspection and learning that takes place while engaged in dialogue about reporting medication errors. Information gained from this study may also benefit nurses, and by extension, patients in the future because of the study’s contribution to the body of knowledge around medication error reporting. However, you may receive no benefit from participating.

Alternatives
You may choose to not participate in this study.

Subject Costs and Payments
You will not be asked to pay any costs related to this research.

You will not be paid for taking part in this study.

Subject's Rights
Your signature on this consent form means that you have received the information about this study and that you agree to volunteer for this research study.

You will be given a copy of this signed form to keep. You are not giving up any of your rights by signing this form. Even after you have signed this form, you may change your mind at any time. Please contact the study staff if you decide to stop taking part in this study.

If you choose not to take part in the research or if you decide to stop taking part later, your benefits and services will stay the same as before this study was discussed with you. You will not lose these benefits, services, or rights.

Your Health Information

We may be collecting health information that could be linked to you (protected health information). This protected health information might have your name, address, social security number or something else that identifies you attached to it. Federal law wants us to get your permission to use your protected health information for this study. Your signature on this form means that you give us permission to use your protected health information for this research study.

If you decide to take part in the study, your protected health information will not be given out except as allowed by law or as described in this form. Everyone working with your protected health information will work to keep this information private. The results of the data from the study may be published. However, you will not be identified by name.

People who give medical care and ensure quality from the institutions where the research is being done, the sponsor(s) listed in the sections above, representatives of the sponsor, and regulatory
H-26987- NURSE LIKELIHOOD TO REPORT A PEDIATRIC MEDICATION ERROR:
EXAMINATION OF THE "PRE-REPORTING" PERIOD

agencies such as the U.S. Department of Health and Human Services will be allowed to look at
sections of your medical and research records related to this study. Because of the need for the
investigator and study staff to release information to these parties, complete privacy cannot be
guaranteed.

The people listed above will be able to access your information for as long as they need to, even after
the study is completed.

If you decide to stop taking part in the study or if you are removed from the study, you may decide that
you no longer allow protected health information that identifies you to be used in this research study.
Contact the study staff to tell them of this decision, and they will give you an address so that you can
inform the investigator in writing. The investigator will honor your decision unless not being able to use
your identifiable health information would affect the safety or quality of the research study.

The investigator, MARILYN HOCKENBERRY, and/or someone he/she appoints in his/her place will try
to answer all of your questions. If you have questions or concerns at any time, or if you need to report an
injury related to the research, you may speak with a member of the study staff: MARILYN
HOCKENBERRY at 832-824-1726 during the day and FRANCINE KINGSTON at 713-249-5654 after
hours.

Members of the Institutional Review Board for Baylor College of Medicine and Affiliated Hospitals (IRB)
can also answer your questions and concerns about your rights as a research subject. The IRB office
number is (713) 798-6970. Call the IRB office if you would like to speak to a person independent of the
investigator and research staff for complaints about the research, if you cannot reach the research staff,
or if you wish to talk to someone other than the research staff.
CONSENT FORM
RN Focus Group Participant
Institutional Review Board for Baylor College of Medicine and Affiliated Hospitals

H-26987- NURSE LIKELIHOOD TO REPORT A PEDIATRIC MEDICATION ERROR:
EXAMINATION OF THE "PRE-REPORTING" PERIOD

Signing this consent form indicates that you have read this consent form (or have had it read to you),
that your questions have been answered to your satisfaction, and that you voluntarily agree to
participate in this research study. You will receive a copy of this signed consent form.

Subject ____________________________________________ Date ________________

Investigator or Designee Obtaining Consent ____________________________ Date ________________

Witness (if applicable) ____________________________ Date ________________

Translator (if applicable) ____________________________ Date ________________

Approved from June 04, 2010 to May 18, 2011 Chair Initials: J. K.
Appendix D: Bulletin Board Announcements and Advertisements

Inpatient RNs… Participate in Research

LITTLE IS KNOWN ABOUT THE PERIOD DURING WHICH A NURSE IS CONSIDERING WHETHER TO REPORT A MEDICATION ERROR. BUT WE KNOW THERE CAN BE A STRONG EMOTIONAL AND PHYSICAL RESPONSE TO REALIZING WE MADE A MEDICATION ERROR.

Part of error management research should include an understanding of this “Pre-reporting” period when we as nurses process and manage the personal and emotional impact of making a medication error.

Together we can help nurses cope more effectively with this struggle and ultimately improve reporting of medication errors.

Are you an RN on an inpatient unit?
If you can spend 60-90 minutes on a focus group … Call Francine Kingston 832-824-2491

We will talk more about the study and we can sign you up for a focus group right here at the hospital during work hours

Please note: This is doctoral dissertation research being conducted by a student researcher (Francine) at the UTHSC School of Public Health. Your participation and all of your answers are confidential and will be reported only in aggregate rolled up with all other’s responses. You will NOT be talking about your own error; you will be talking in general about this “pre-reporting” period of error reporting…about the thoughts and feelings experienced by any nurse upon realizing they just made an error.

You never have to reveal to the group whether you personally ever made a medication error.

Call today and make a difference
Appendix E:  IRB Approval – Baylor College of Medicine

Human Approval Letter
June 04, 2010
Marilyn Hockenberry
Baylor College of Medicine
Pediatrics: Hema & Oncology

Baylor College of Medicine
Office of Research
One Baylor Plaza, 600D
Houston, Texas 77030
Phone: (713) 798-6970
Fax: (713) 798-6990
Email: irb@bcm.tmc.edu

H-26987 - Nurse Likelihood to Report a Pediatric Medication Error:
Examination of the "Pre-Reporting" Period


Dear Dr. Hockenberry

The Institutional Review Board for Human Subject Research for Baylor College of Medicine and Affiliated Hospitals (BCM IRB) is pleased to inform you that the research protocol and consent form(s) named above were approved.

The study may not continue after the approval period without additional IRB review and approval for continuation. You will receive an email renewal reminder notice prior to study expiration; however, it is your responsibility to assure that this study is not conducted beyond the expiration date.

Please be aware that only IRB-approved informed consent forms may be used when written informed consent is required. Any changes in study or informed consent procedure must receive review and approval prior to implementation unless the change is necessary for the safety of subjects. In addition, you must inform the IRB of adverse events encountered during the study or of any new and significant information that may impact research participants’ safety or willingness to continue in your study.

The BCM IRB is organized, operates, and is registered with the United States Office for Human Research Protections according to the regulations codified in the United States Code of Federal Regulations at 45 CFR 46 and 21 CFR 56. The BCM IRB operates under the BCM Federal Wide Assurance No. 00000286, as well as those of hospitals and institutions affiliated with the College.

Sincerely yours,
Julie Pamela Katkin, M.D.
Institutional Review Board for Baylor College of Medicine and Affiliated Hospitals
Appendix F: IRB Approval – University of Texas CPHS

The Committee for the Protection of Human Subjects
Office of Research Support Committees

Dr. Francine Kingston
UT-H - GEN - Default Department Code

NOTICE OF APPROVAL TO BEGIN RESEARCH

June 28, 2010

HSC-SPH-10-0114 - Nurse Likelihood to Report a Pediatric Medication Error: Examination of the Pre-Reporting Period

PROVISIONS: This approval relates to the research to be conducted under the above referenced title and/or to any associated materials considered by the Committee for the Protection of Human Subjects, e.g., study documents, informed consent, etc.

APPROVED: By Expedited Review and Approval

REVIEW DATE: 4/12/2010

APPROVAL DATE: 6/28/2010

EXPIRATION DATE: 3/31/2011

CHAIRPERSON: Anne Dougherty, MD

Subject to any provisions noted above, you may now begin this research.

CHANGES: The principal investigator (PI) must receive approval from the CPHS before initiating any changes, including those required by the sponsor, which would affect human subjects, e.g., changes in methods or procedures, numbers or kinds of human subjects, or revisions to the informed consent document or procedures. The addition of co-investigators must also receive approval from the CPHS. ALL PROTOCOL REVISIONS MUST BE SUBMITTED TO THE SPONSOR OF THE RESEARCH.

INFORMED CONSENT: When Informed consent is required, it must be obtained by the PI or designee(s), using the format and procedures approved by the CPHS. The PI is responsible for instructing the designee in the methods approved by the CPHS for the consent process. The individual obtaining informed consent must also sign the consent document. Please note that only copies of the stamped approved informed consent form can be used when obtaining consent.

HEALTH INSURANCE PORTABILITY and ACCOUNTABILITY ACT (HIPAA): The study must meet all HIPAA research requirements. For compliance guidelines see details on the Committee for the Protection of Human Subjects website at:
http://www.uth.tmc.edu/ut_generalresearch_arch档_affil/ospf/guidelineshipaa.htm

UNANTICIPATED RISK OR HARM, OR ADVERSE DRUG REACTIONS: The PI will immediately inform the CPHS of any unanticipated problems involving risks to subjects or others, of any serious harm to subjects, and of any adverse drug reactions.
REFERENCES


VITAE
Francine Kingston, MSN, RN-BC
2114 Ocean View
Seabrook, Texas  77586
(713) 249-5654

CURRENT POSITION  
Director, Clinical Training and Development (CTD) 
Texas Children’s Hospital, Houston, Texas

EDUCATIONAL BACKGROUND

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<td>RN, BSN 8/79</td>
<td>The University of Michigan School of Nursing. Ann Arbor, Michigan</td>
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CERTIFICATION  
Nursing Professional Development - ANCC since 1994

PROFESSIONAL EXPERIENCE

Texas Children’s Hospital (TCH) 6621 Fannin  MC 4-1440 Houston, TX  77030
Director, Clinical Training and Development – 10/2003 to present
Leadership for the learning function ensuring the establishment, implementation, evaluation, and improvement of high quality and cost-effective processes that facilitate competence assessment, educator and staff training and development, performance consultation, and student affiliations in clinical areas across the TCH IDS. Led the team in design and implementation of the First Line Code Med Dosing Calculation Sheet. Created the clinical educational model for occupancy training of new patient care tower. Served as operations lead on the design, build, occupancy, and staffing for the TCH Simulation Center which opened November, 2009.

Texas Children’s Hospital  6621 Fannin  MC 4-1440 Houston, TX  77030
Training and Development Specialist - 5/91 to 10/2003 - Management of the design, implementation, and evaluation of staff development programs within the TCH Learning Academy based on standards, identified learning needs, and continuous performance improvement activities. Leadership on committees, and teams to assist in the development of staff and in the improvement of processes toward the attainment of organizational goals and regulatory agency requirements. Collaboration with management teams to ensure development of decentralized educators.

San Jacinto College Central  8060 Spencer Highway  Pasadena, Texas  77505 Instructor, Department of Associate Degree Nursing - 4/83 to 6/91 - Pediatric course coordinator.

M. D. Anderson Hospital  Houston, Texas  77073 5/81 to 6/83 Staff nurse on adolescent cancer unit; charge on afternoon shift.
Mott Children's Hospital  Ann Arbor, Michigan  48109  8/79 to 5/81 Staff nurse on primary care unit
caring for adolescent patients; charge duties on all shifts.

PROFESSIONAL ORGANIZATIONS
Society for Simulation In Healthcare
Sigma Theta Tau, Zeta Pi Chapter, Houston, Texas
National Nursing Staff Development Organization
American Society of Training & Development
American Nurses Association

PROFESSIONAL PRESENTATIONS
“Pediatric Falls Benchmarking Collaborative” a webinar to the New Jersey Hospital Association

“Educator Productivity & Outcomes” round table at the CHEX Learning Executives meeting in Kansas

“Building & Sustaining a Hospital-Based Multidisciplinary Simulation Center”, podium presentation at
the 10th Annual International Medical Simulation in Healthcare Conference on January 26, 2010 in
Phoenix, AZ.

" S-T-R-E-T-C-H Goals for your Staff Development Department", podium presentation local chapter
meeting of the National Nursing Staff Development Organization (NNSDO), held November 8, 2007
in Houston, Texas.

“Pediatric Falls: Multi-facility Collaboration on Process and Outcomes” podium presentation at the
Magnet Conference held October 3-5, 2007 in Atlanta, Georgia.

" S-T-R-E-T-C-H Goals for your Staff Development Department", podium presentation at the Annual
Convention of the National Nursing Staff Development Organization (NNSDO), held July 10 - 13,
2007 in Atlanta, Georgia.

“Specialty Group Collaborations: Are Small Collaborations Possible?” poster presented at the
inaugural conference of the National Database of Nursing Quality Indicators, January 29-31, 2007, in
Las Vegas, Nevada.

"Collaborating to Enhance Educational Capacity and Increase Access to Career Opportunities",
podium presentation at Pediatric Nursing  22nd Annual Conference, September 14-16, 2006, Dallas,
Texas and again at the ANCC Ninth Annual National Magnet Conference in Miami, Florida, March

“Camp Discovery: GN Retention Strategy”, podium presentation at Professional Nurse Educator

"WINNER: Workforce Increases in Nurses and Nursing Faculty: Excellence in Resource
Collaboration" podium presentation at the Children's Hospital Association of Texas (CHAT)
Conference, Oct 7-8, 2005 in Houston, Texas

“Peer Review Panel – It's Your Call!”, mock peer review skit presented as part of “Contemporary
Legal Issues in Nursing Practice” Sponsored by Texas Nurses Association District 19, Houston,


“Sedation of Pediatric Patients – Performance Measurement”, poster presentation at the 1999 annual conference of the Society for Pediatric Nursing.

"Follow the Yellow Brick Road to Excellence", podium presentation at the National Nursing Staff Development Annual Conference July 1994.

PROFESSIONAL PUBLICATIONS


LICENSURE