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Nurses' Experience with Medication Errors

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Abstract

Medication administration is an inherent nursing task, placing nurses at significant risk for experiencing errors. A systematic literature review established that nurses experience emotional, cognitive, and physical distress effects following medication errors, positioning nurses as second victims. The purpose of the DNP Capstone Project was to evaluate the lived experiences and coping responses of pediatric direct-care nurses working in a Rocky Mountain region tertiary care facility to assess whether the nurses have unmet post-event support needs. A descriptive, non-experimental, mixed methods survey instrument was used for this study. Of the 115 direct-care nurses employed in the selected department, 82 were invited to participate in the capstone study and 66 completed the survey instrument (80.5% return rate). Data was analyzed using descriptive and correlational statistics for coping responses, category of medication error experienced, nurses' perceptions of fear, shame, and guilt, and preferred support interventions. All subjects report experience with medication errors - ranging from working in a setting predisposing error to an error resulting in patient death. Nurses report fear, shame, and guilt as distress effects occurring in all medication error categories. Nurses' feeling shame after an error were most likely to also report guilt (r = .82 - .97, $p < .001$). Nurses' adaptive coping responses prevail over maladaptive reactions. Nurses identify open, empathetic conversations with peers, family, and supervisors as optimal sources of support following medication error events. Recommendations include creating a formalized support process featuring effective communication education for departmental leadership to use with nurse second victims.

Keywords: DNP Capstone Project, second victim, distress, support

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Executive Summary

Problem

Medication administration is a task inherent in the scope of practice for nurses, placing nurses at significant risk for experiencing an error. While the harm imposed upon the patient (the first victim) is of great concern to patients, providers, and organization, the harm that occurs to the nurse (the second victim) frequently is overlooked (Hall & Scott, 2012; Scott et al., 2009; Scott et al., 2010; White et al., 2008). Evidence establishes nurses experience a range of emotional, psychological, and physical distress effects following medication error events (Scott et al., 2009; Scott et al., 2010; Wolf et al., 2000). Additionally, the ways people cope with stressful events affect their emotional and physical reactions (Carver et al., 1989; Folkman & Lazarus, 1988; Folkman et al., 1986). Often, the nurse second victim seeks support from peers and supervisors following the medication error incident, yet there is not current understanding whether the distress effects on the second victim are mitigated by these means (White et al., 2008).

Purpose

The purpose of the capstone project was to evaluate pediatric hematology/oncology/bone marrow transplant direct-care nurses' experiences with medication error incidence, responses, and coping styles in order to assess if there are unmet needs in the support of direct-care nurses involved in medication error events.

Goals

Goals included increasing nursing staff and management awareness of medication error events, understanding the distress effects in nurses following medication errors, and developing a mechanism for management to provide support to nurses in distress.

Objectives

Objectives for the capstone project included identifying nurses' experiences with medication errors, assessing coping responses, and eliciting preferred support interventions following an error event. The ultimate outcome was to create recommendations of a formalized support process for nursing management to employ with all nursing staff experiencing a medication error event.

Plan

The capstone project used a descriptive, mixed methods, non-experimental design via an anonymous survey instrument. Direct-care nurses currently working in the identified department at the clinical facility were informed of the project and invited to participate. Data was aggregated; analysis was conducted using descriptive statistics of coping responses, categories of medication error and patient harm, nurses' self-perceptions of fear, shame, and guilt following an error, and preferred support interventions. Correlational statistics were used to determine possible relationships between coping styles, distress effects, and support options.

Outcomes and Results

Sixty-six nurses completed the survey for an 80.5% response rate. All 66 nurses in the study have experienced some form of medication error - ranging from an environment in which an error could occur (Category A) to an error occurring resulting in patient death (Category I). Nurses report self-perceptions of *fear* (M = 6.3 - 9.2), *shame* (M = 4.7 - 9.1), and *guilt* (M = 5.4 - 9.4) as distress effects occurring among error categories. Positive correlations were found within nurses' feelings of fear, shame, and guilt; nurses experiencing shame after an error were most likely to also report guilt (r = .82 - .97, $p < .001$). Positive, adaptive coping responses prevailed over maladaptive reactions. Finally, the nurses identify open, accessible conversations with colleagues, family, and supervisors as optimal sources for emotional and psychological support to assist with self-reconciliation following a medication error event, though weak or insignificant correlations were found between coping style and support method. Recommendations include creating a formalized support process.

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Following a seminal report issued by the Institute of Medicine calling attention to the appalling incidence and cost of medical errors in the United States' health care system, health care organizations are paying ever-increasing attention to their role in patient safety and quality care provision (Kohn, Corrigan, & Donaldson, 2000; White, Waterman, McCotter, Boyle, & Gallagher, 2008). While much attention has been allotted to the myriad impacts of adverse health care events on the patients victimized by the medical errors, not enough consideration has been placed on the health care provider directly involved in the error event. Evidence establishes health care providers experience significant distress related to the commission of an adverse health care event, including medication-related errors, intense enough to affect personal and professional performance (Hall & Scott, 2012; Scott et al., 2009; Scott et al., 2010; White et al., 2008; Wolf, Serembus, Smetzer, Cohen, & Cohen, 2000).

The Doctor of Nursing Practice (DNP) capstone project is an in-depth scholarly work addressing a complex practice-based problem using existing evidence to propose, analyze, and evaluate an intervention specific for the identified problem (White & Zaccagnini, 2011). The area of study for the capstone project was distress in nurses following medication error. The capstone paper will thoroughly present the practice-based issue of the impact of medication errors on direct-care nurses through identifying and defining the problem, reviewing the literature evidence, analyzing the market and risks, outlining project objectives, and discussing the study findings, recommendations, and implications for change.

Problem Recognition and Definition

In recent national news, an experienced neonatal intensive care nurse in Seattle, Washington committed suicide following her commission of a fatal medication error and the

sequelae of events that followed (Ostrom, 2011). In the seven months transpired between the medication error event and the nurse's suicide, the nurse experienced professional termination from her organization, legal and disciplinary action from her state board of nursing, and profound personal distress as she struggled with her loss of professional identity and her perceptions of what it meant to commit the fatal medication error (Ostrom, 2011). While suicide may be an extreme example of the extent of personal and professional distress experienced by nurses following commission of a medication error, it is an indicator to the depth of the practice issue and its implications for nurses and health care organizations seeking to avoid similar situations.

Project Significance, Scope, and Rationale

Medication administration is a task inherent in the scope of practice for nurses, which places nurses at significant risk for experiencing a medication error. While the harm imposed upon the patient (the first victim) is of great concern to patients, providers, and organization, the harm that occurs to the nurse (the second victim) frequently is overlooked (Hall & Scott, 2012; Scott et al., 2009; Scott et al., 2010; White et al., 2008). Current literary evidence demonstrates that nurses experience a range of emotional, psychological, and physical distress effects following commission of a medication error (Hall & Scott, 2012; Scott et al., 2009; Scott et al., 2010; Wolf et al., 2000). Additionally, evidence reveals the ways people cope with stressful events affect their emotional and physical reactions following the stressor (Carver, Scheier, & Weintraub, 1989; Folkman & Lazarus, 1988; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Often, the second victim seeks support from peers and supervisors following the medication error incident, yet there is not current understanding whether the emotional, physical,

and psychological effects on the second victim is mitigated by these means (Edrees, Paine, Feroli, & Wu, 2011; White et al., 2008).

Personal observations by this author as a direct-care nurse on an acute care pediatric hematology/oncology/bone marrow transplant unit in a tertiary care, metropolitan, non-profit, pediatric hospital in the Rocky Mountain region supported the practice-based problem of nurses experiencing personal and professional impacts following medication error events. While the literature demonstrates the existence of nurses experiencing distress following medication error events, there was no baseline information on the pervasiveness of this complex issue within the particular clinical site being used for the capstone project. Thus, the purpose of the capstone project was to evaluate pediatric hematology/oncology/bone marrow transplant direct-care nurses' experiences with medication errors within this Rocky Mountain region hospital in order to assess if there were unmet needs in the support of direct-care nurses involved in medication error events.

The supposition for the capstone project was that nurses experience psychological, emotional, and physical distress following commission of a medication error. Houser and Oman (2011) identify the population, intervention, comparison, outcome (PICO) acronym as a mechanism to formulate the evidence-based practice question and guide the subsequent literature search. Thus, the following PICO was developed for the capstone project:

P (Population): Direct-care nurses working in pediatric hematology/oncology/bone marrow transplant at a metropolitan, non-profit, tertiary care hospital in the Rocky Mountain region.

I (Intervention): Distribution and analysis of a survey instrument assessing nurses' experience with medication error types and perception of fear, shame, and guilt related to

each category of medication error, coping responses, and preferred support intervention following medication error occurrence.

C (Comparison): There is no baseline information on medication error experience for direct-care nurses at this facility.

O (Outcome): Evidence nurses experience distress and have unmet support needs following medication error occurrences.

The final PICO question is: in direct-care nurses working in pediatric hematology/oncology/bone marrow transplant at a metropolitan, non-profit, tertiary care hospital in the Rocky Mountain Region, will analysis of a survey assessing nurse experience with medication error types, coping responses, and preferred support intervention following medication error experience, as compared to no baseline data, provide evidence that nurses experience distress and have unmet support needs following medication error occurrences?

The objectives for the capstone project included identifying nurses' experiences with medication errors, assessing participant coping styles, and understanding preferred interventions for support following a medication error event. Through correlating direct-care nurses' experiences with medication error events with coping responses and support interventions, this author sought to create recommendations to formalize a support process for nursing management to utilize with nurses who experience a medication error event.

The impact of medication error on direct-care nurses is a pertinent practice-based problem warranting prompt attention in order to facilitate nursing management's awareness, understanding, and ability to assist and support the nurse, as second victim, experiencing personal and professional harm following a medication error. Development of a properly formatted problem statement assisted in directing the in-depth literature review and selection of

theoretical foundations upon which to base the capstone project and drive the changes in practice.

Theoretical Foundations

Integrating theoretical foundations into the capstone project assisted in creating conceptual frameworks for the project development and implementation (White & Zaccagnini, 2011). The first theoretical underpinning used in developing the capstone project was Crigger and Meek's (2007) "Self-Reconciliation After Making Mistakes in Hospital Practice" process, which is based on grounded theory methods. Crigger and Meek (2007) detail a four-stage, sequential, self-reconciliation process common to the erring nurse: *reality hitting* (the realization of having made an error), *weighing in* (determining the need to disclose the error), *acting* (determining the best course in responding to the error), and *resolving* (evaluating the harm that had or had not been done in order to move forward). Using an error reconciliation process applicable to hospital-based nurses assisted this author in understanding the emotional, psychological, and physical distress process trajectory following medication error events, as well as applying meaning to the data specific for the capstone project population.

Additionally, as this author's capstone project addressed the lived experiences of nurses following medication error occurrence and the opportunity to address unmet support needs, Swanson's (1991) middle-range Theory of Caring served as an appropriate theoretical foundation. Swanson (1991) defines caring as "a nurturing way of relating to a valued other toward whom one feels a personal sense of commitment and responsibility" (p.162). This definition of caring is substantiated through five basic processes: knowing, being with, doing for, enabling, and maintaining belief (Swanson, 1991; Swanson & Wojnar, 2004). Each of the five caring processes has further subdimensions that assist the nurse in achieving the caring intent in

practice. *Knowing* includes avoiding assumptions, centering on the one cared for, assessing thoroughly, seeking cues, and engaging the self of both (Swanson, 1991; Swanson & Wojnar, 2004). *Being with* involves being there, conveying ability, sharing feelings, and being non-burdening as the one doing the caring (Swanson, 1991; Swanson & Wojnar, 2004). *Doing for* includes comforting, anticipating, performing competently and skillfully, protecting, and preserving dignity for the other (Swanson, 1991; Swanson & Wojnar, 2004). *Enabling* necessitates informing and explaining, supporting beliefs and allowing feelings, focusing, generating alternatives and thinking it through, and validating or giving feedback (Swanson, 1991; Swanson & Wojnar, 2004). Finally, *maintaining belief* involves believing in and holding the other in esteem, maintaining a hope-filled attitude, and offering realistic optimism for the other (Swanson, 1991; Swanson & Wojnar, 2004). By applying these caring elements to the capstone project, this author was able to focus a framework for creating the project mission and vision, defining goals and objectives, and creating the support process recommendations for nursing management to utilize when addressing nurses' experience with medication error.

A third theoretical foundation integral in the development and implementation of the capstone project was Rogers' (2004) Diffusion of Innovation, which served as the change theory guiding this author's final recommendations. Rogers (2004) defines *diffusion* as "the process through which an *innovation*, defined as an idea perceived as new, spreads via certain communication channels over time among the members of a social system" (p. 13). The diffusion of innovation encompasses five steps: knowledge of the innovation, persuasion, decision to adopt/reject, implementation, and confirmation (Torre & Crowley, 2011). Change agents and opinion leaders steer the change process (Torre & Crowley, 2011). In the capstone

project, this author serves as the change agent, while the author's Clinical Mentor and department-based nursing leadership assist as opinion leaders.

Review of Evidence

A systematic review of the evidence (SRE) was completed through CINAHL with Full Text, MEDLINE, and Academic Search Premier databases using multiple search term combinations, including "medication error", "distress", "second victim phenomenon", "perception", "health care provider", "nurse coping", and "nurses" (Appendix A). The search term "medication error" resulted in 1,387 articles; "medication error" and "nurses" resulted in 599 articles. Restricting the search date range to between the years 2000-2012 further refined the results to 433 articles (Table 1). The final 433 articles were narrowed down further by this author through reading each article abstract to assess applicability to the capstone project problem statement regarding the impact of medication errors, and focusing on nurse perceptions, coping, distress, and the second victim phenomenon, as opposed to the systems or application processes leading to medication error occurrences. The resulting in-depth SRE includes 38 articles detailing the phenomenon of health care providers and medication error, second victims of adverse health care events, and nurses' perceptions of their experience with medication error.

The majority of research in the current literature explores the concepts of medication error and nurses' perceptions from a descriptive, qualitative perspective in order to understand the unique experiences of the participants. The pervasive evidence within the literature review conducted for the capstone project demonstrates the existence of emotional, physical, and psychological effects on the health care provider in direct response to their experiences with medication error, especially when actually or presumably causing patient harm, and the need for adequate support mechanisms in order to mitigate the negative consequences to the care provider

(Edrees et al., 2011; Hall & Scott, 2012; Scott et al., 2009; Scott et al., 2010; White et al., 2008; Wolf et al., 2000).

Table 1

Literature Review Search Terms and Results

Search Term	Number of Results
Medication error	1387
Medication error + Nurses	599
Date Range 2000-2012	433
Medication error + Nurse Perception (Date Range 2000-2012)	59
Medication error + Nurse Coping (Date Range 2000-2012)	4
Second Victim Phenomenon (no limiters)	110
Medication error + Distress (Date Range 2000-2012)	18

White et al. (2008) conducted a literature review of sources depicting the existence of harm to health care providers following medical errors, personal and professional effects of medical error on the multidisciplinary health care providers, and barriers to organizational support systems. The authors synthesized one study detailing physicians' reports on the risk of medical error exacerbating existing job stress, increasing burnout and depression, and decreasing quality of life (White et al., 2008). Additionally, White et al. (2008) identify nurses as the most likely population to describe negative emotions, fear of litigation or other disciplinary action, and lack of support from peers and managers following medical error when compared with physician and pharmacist counterparts. Due to being unsure of where to turn to, who to seek counsel from, or who to trust within the organization, most health care providers cope with the negative

emotional, physical, and psychological effects of their medical error in silence and isolation (Scott et al., 2009; White et al., 2008).

Similarly, Wolf et al. (2000) conducted a descriptive, correlational study to investigate multi-disciplinary health care providers' responses to commission of medication errors and their associations with anticipated patient harm. The sample of Pennsylvania's nurses, physicians, and pharmacists completed an open-ended survey detailing their most serious medication error and their responses and concerns to the error occurrence (Wolf et al., 2000). The authors discovered over half of the health care provider respondents estimated and feared greater patient harm than actually occurred, that wrong drug and excessive dose were the two most commonly reported errors, and guilty, worried, fearful, humiliated, self-disgust, panicked, and anguished were some of most prevalent provider responses following the incident (Wolf et al., 2000). Additionally, the health care providers in the Wolf et al. (2000) study reported they found more support and solace in friends and family as compared with peers and managers, especially since health care providers are socialized to expect punishment following a medication error.

In attempting to understand the reason medication error profoundly affects nurses, it is important to understand the current medication delivery environment. In considering that medication administration is a patient-focused task deeply embedded within the nursing profession, every working professional is at risk of experiencing a medication error. The incidence of a medication error may be as frequent as 19-25% of one's working day, with a single nurse potentially administering up to 50 different medications per shift (Rassin, Kanti, & Silner, 2005). Implementing quality improvement and patient safety mechanisms such as barcode medication administration, computerized dispensaries, and electronic medical records are important and progressive means of improving an organization's culture of safety and

reducing the incidence of medication errors, thereby perpetuating an errorless imperative (Jones & Treiber, 2010; Jones & Treiber, 2012; Treiber & Jones, 2010). While the addition of technological advances in medication administration may improve patient safety, it also poses issues with nursing staff in terms of decreasing patient contact time, increasing delays in administering medications, and ultimately increasing frustration and carelessness (Jones & Treiber, 2010; Jones & Treiber, 2012; Treiber & Jones, 2010). These aforementioned effects may compound feelings of distress experienced by nurses when a medication error occurs despite the advanced patient safety measures.

In a study conducted by Jones and Treiber (2010), data revealed there are multiple factors within the work environment leading to medication error occurrence. These contributing factors include physician handwriting legibility, lack of following the five rights of medication administration, unsafe nurse to patient ratios or lack of staff, nurse incompetence or physical exhaustion, verbal orders not clear, similar sounding or looking medications, high volume of medications to be administered at busy times, acuity status of the patients, and level of experience (Jones & Treiber, 2010). Regardless of whether the medication error links to a system or organizational issue as listed previously the literature supports that nurses relate the occurrence of medication error to personal and professional incompetence (Jones & Treiber, 2010).

Nurses' perceptions about the error event have profound impact on their personal and professional identities. The perception incompetence created the medication error leads nurses to blame themselves for the error, which is a belief bearing profound and irreversible effects on the nurses both personally and professionally (Schelbred & Nord; 2007; Treiber & Jones, 2010; White et al., 2008). Committing a medication error directly opposes nurses' professional

paradigm and unrealistic expectations of perfection in clinical practice (Serembus, Wolf, & Youngblood, 2001; Treiber & Jones, 2010; White et al., 2008). Thus, experiencing a medication error strikes against nurses' personal and professional goals to provide safe and effective patient care which relieves suffering, promotes health, and restores wellness, and instead places them in the position of second victim (Edrees et al., 2011; Serembus et al., 2001; Smetzer, 2012).

Multiple sources in the SRE detail the immediate emotional, psychological, and physical reactions reported by nurses following a medication error (Arndt, 1994; Crigger & Meek, 2007; Hall & Scott, 2012; Jones & Treiber, 2010; Karga, Kiekkas, Aretha, & Lemonidou, 2011; Mayo & Duncan, 2004; Scott et al., 2009; Scott et al., 2010; Serembus et al., 2001; Smetzer, 2012; Treiber & Jones, 2010; Wolf et al., 2000). When these feelings are left to smolder, nurses begin to experience maladaptive coping mechanisms and long-term distress effects akin to those of post-traumatic stress disorder (PTSD): depression, sleep and appetite disturbances, flashbacks of the event, and protracted anxiety (Rassin et al., 2005; Serembus et al., 2001; Smetzer, 2012; White et al., 2008). Rassin et al. (2005) depict PTSD as a phenomenon involving an inability to process successfully fear associated with the event, as well as feelings of guilt, shame, and sadness. Most often, the nurses fear coworker judgment, disciplinary action, and litigation - repercussions which further damage their perceptions of personal and professional self (Rassin et al., 2005; Schelbred & Nord, 2007; Scott et al., 2009; Smetzer, 2012).

A series of three articles published by Scott and colleagues describe the second victim phenomenon in health care providers following adverse medical events from the perspective of a Midwest academic medical center (Hall & Scott, 2012; Scott et al., 2009; Scott et al., 2010). Hall and Scott (2012) concluded one in seven staff members at their medical center reported personal effects within the calendar year subsequent to committing an adverse medical event.

Throughout their three articles, the authors describe the health care providers' reported emotional feelings of shock, worry, guilt, shame, anger, fear, and depression, as well as the long-term effects of sleep disturbances and difficulty concentrating - even in instances in which no harm came to the patient subsequent to an adverse event (Hall & Scott, 2012; Scott et al., 2009; Scott et al., 2010). In a web-based survey designed to tabulate the frequency and characteristics of the second victim experience among 898 participating health care professionals within the six facilities of the Midwestern academic medical center study site, Scott and colleagues (2010) discovered 30% (n = 269) experienced personal problems (anxiety, depression, doubts about being able to do their jobs) in the prior year and 15% (n = 40) considered leaving their chosen profession. Additionally, through semi-structured interviews of 31 multi-disciplinary professionals, Scott et al. (2009) revealed second victims go through a six-stage recovery trajectory when attempting to cope with an adverse patient healthcare event: *chaos and accident response* (error recognition); *intrusive reflections* (isolating oneself and re-enacting the event, fear); *restoring personal integrity* (managing gossip, questioning trust within work/social structures, wondering about repercussions); *enduring the acquisition* (realizing the seriousness, delving into error causation, experiencing physical and emotional symptoms); *obtaining emotional first aid* (seeking and receiving personal and professional support); and *moving on* through *dropping out* (quitting or transferring to another facility), *surviving* (coping, but with persistent sadness), or *thriving* (gaining insight and perspective on the event and advocating for patient safety initiatives).

Nurses' coping abilities relate to their perceptions of the medication error experience and their subsequent emotional and physical reactions (Crigger & Meek, 2007; Karga et al., 2011; Rassin et al., 2005; Schelbred & Nord, 2007). Talking with others, accepting responsibility, and

seeking social support are identified as positive, adaptive coping strategies (Karga et al., 2011; Meurier, Vincent, & Parmar, 1997; Schelbred & Nord, 2007). Meurier et al. (1997), in their study of 129 ward nurses in a district hospital in Great Britain, similarly found nurses using adaptive coping strategies through being willing to take responsibility for their error (68%), holding positive outlook for their future course of action (64%), using emotional support (25%), and seeking advice from friend or relatives (18%). Conversely, distancing, denial, refusing to discuss the event, and avoidance are examples of maladaptive coping strategies negatively affecting the nurses following medication error incidence (Meurier et al., 1997). Nurses in the Meurier et al. (1997) study turned to maladaptive coping mechanisms through distancing (16%), trying to forget about it (14%), refusing to talk about the incident (19%), and wishing the situation would go away (39%). Additional articles describing coping and its relationship with emotional and physical responses were evaluated to create further understanding of factors influencing nurses' reactions to medication error experiences (Carver, Scheier, & Weintraub, 1989; Folkman & Lazarus, 1988; Folkman et al., 1986).

Finally, Edrees and colleagues (2011) conducted a non-experimental study on the demand and need for second victim support interventions within their clinical facility in Baltimore, Maryland. From a sample of 95 registered nurses and physicians employed at Johns Hopkins Hospital, the authors discovered health care workers within their health facility preferred the following support interventions: prompt debriefing/crisis intervention stress management (75%), an opportunity to discuss ethical concerns relating to the event or subsequent processes (46%), a safe opportunity to contribute insights into how similar events could be prevented in the future (45%), formal emotional support (35%), access to counseling or psychological/psychiatric services (35%), an opportunity to take time out from clinical duties

(34%), supportive guidance/mentoring as clinical duties resume (31%), and informal emotional support (29%).

Medication administration is a task centrally embedded in nursing practice. Due to the extensive evidence detailing the prevalence of health care providers experiencing emotional, physical, and psychological distress effects subsequent to adverse health care events, it was appropriate to postulate the nurses at the capstone project clinical site experience similar patterns of harm with medication error incidence, and have similar needs for emotional, physical, and cognitive support.

Project Plan and Evaluation

Market/Risk Analysis

Important components for the capstone project planning process included analysis of existing and available resources and project stakeholders, detection of organizational readiness for the project, and investigation of the project costs/benefits and risks (White & Zaccagnini, 2011). The pediatric tertiary care facility in which the capstone project occurred is a Magnet-certified organization highly invested in optimizing quality of care while minimizing patient preventable harm.

As such, the organization also is invested in creating a culture of safety and transparency for all health care providers. This author conducted an analysis of the strengths, weaknesses, threats, and opportunities (SWOT) in relation to the capstone project and the clinical site (Table 2). Strengths included organizational and safety leaders' support for the project, access to use of the facility and its nursing staff to conduct the project, and an emerging presence of the second victim phenomenon in the literature. Threats to successful completion of the capstone project included timeliness of institutional review board (IRB) approval, adequate participant

response rate, disruption to the timeframe (Appendix B), participant situational memory bias when completing the survey instrument, and possibility of not being able to generalize the capstone project study findings.

Identified stakeholders in the capstone project included the pediatric hematology/ oncology/bone marrow transplant patients within the clinical facility, the department's direct-care nursing staff, department operational and nursing management, the facility's safety leaders, executive management, other health care providers within the department and facility, and this author's capstone project team. The team for the capstone project consisted of the principal investigator (DNP student), facility-based DNP Clinical Mentor, and DNP Capstone Chair.

Table 2

SWOT Analysis for Capstone Project

Strengths	**Weaknesses**
• Safety leaders' support for project • Organization support for project • Access to clinical facility and resources • Large nursing staff population in department • Observational data that the second victim phenomenon exists at the clinical site • Clinical Mentor, Capstone Chair support • Project leader currently employed at clinical facility • Nurses administer large volume of high-risk medications to an acute care population • Minimal budgetary impact	• Limited research available to guide study • Need to create survey instrument due to lack of existing resource • Limited timeframe to complete study • Existing co-worker relationship with nursing staff in department at facility • Study creating baseline statistical data; no previous data available at facility • Need to transfer paper survey results into online database for secured storage/analysis
Opportunities	**Threats**
• Create understanding of second victim phenomenon at the clinical site • Create support intervention to assist nurses in distress following a medication error incident • Increase staff satisfaction, retention, coping • Decrease staff attrition, subsequent medication errors • Staff able to openly discuss "taboo" subject	• Timeliness in IRB approval • Disruption to timeframe • Adequate participant response rate • Situational memory bias in participant responses • Lack of significance in the data • Ability to recommend support intervention • Ability to generalize findings • Missing data

Cost-Benefit Analysis

The timeframe (Appendix B), budget, and resources available for completing the capstone project were taken into consideration during the work-planning phase of the DNP Project Process Model (Zaccagnini & White, 2011). There were limited financial costs associated with the capstone project (Appendix C). Costs pertained to the time value for the project team to develop and distribute the survey instrument, use of a consultant statistician during project planning, and using a consulting committee to provide content validity of the developed study instrument. Additional costs included supplies and equipment used during the project evaluation process: making copies of the instrument, using existing computers, copiers, and printers at the clinical site, and purchasing IBM SPSS Statistics software for use with the data analysis. There will not be any future costs associated with sustaining the knowledge gained from conducting the capstone project.

The benefits of conducting the capstone project included gaining information on the support needs for direct-care nurses who are providing high-risk medications on a daily basis. Through increased understanding of medication error impact on nurses and creation of recommendations for support interventions, this project will assist nursing management in promptly identifying nurses in distress and intervening in a timely manner, and is sustainable after project completion. Additional benefits to the capstone project will include enhancements to patient and workplace safety, quality, and effectiveness in care delivery as nursing staff feel emotionally and psychologically supported by nursing management following medication error events, as well as potential decreases in the financial costs related to staff turnover and associated recruitment costs to replace nurses competent to work in a specialized patient care area such as pediatric hematology/oncology/bone marrow transplant (Crigger & Meek, 2007).

Study Risks

Risks associated with the capstone project involved the timing of the project, since it was dependent on IRB approval, and the direct-care nurse participant. As the intent of the capstone project was to create understanding of direct-care nurses' experiences with medication errors and coping styles requiring nurses to recollect their error events, this author identified the existence of minimal risk of the study participant experiencing recall distress when completing the survey instrument. In order to mitigate this risk, all study participants had access to prior-existing support systems within the project facility, including the Employee Assistance Program, department nursing leadership, and occupational health. Telephone numbers for each of these existing support systems was made available to all study participants. Additionally, the participant was able to choose to withdraw participation from the project at any point in time.

Project Objectives

The capstone project required development of mission and vision statements, goals, and process/outcomes objectives (White & Zaccagnini, 2011).

Mission and vision. The mission for the capstone project was to investigate and create understanding of direct-care nurses' experiences with medication errors and existing coping mechanisms in order to generate evidence-based support processes for nursing management to use when assisting nurses through their distress process. The vision for the capstone project was for nursing management and organizational leadership to be able to provide respectful, compassionate, timely, and confidential access to emotional and psychological support for all nurses involved in an error event. The five basic processes in Swanson's (1991) Theory of Caring (knowing, being with, doing for, enabling, and maintaining belief) assisted in the establishment of the capstone project mission, vision, and goals.

Goals and process/outcomes objectives. The goals of the capstone project were to augment nursing staff, department management, and organizational leadership awareness of medication error events; increase understanding regarding the impact of medication error experiences on nurses' personal and professional identities as second victims; and develop a sustainable mechanism for department management to utilize in providing emotional, psychological, and physical support to nurses in distress. Current evidence links the second victim phenomenon with immediate and prolonged distress effects on the nurse experiencing preventable patient harm through medication error. The knowledge gained from this study assisted in determining whether this practice-based problem existed at the clinical site, the prevalence of the second victim phenomenon in the nurses, and whether there were unmet needs around support of nurses involved in medication error events in the project site's pediatric hematology/oncology/bone marrow transplant department.

Objectives are the means by which the goals are met in the capstone project (White & Zaccagnini, 2011). Additionally, outcomes objectives specify timeframes to accomplish established goals and process objectives detail the means to accomplish the outcomes objectives (White & Zaccagnini, 2011). Due to the limited literature directly dealing with the phenomenon of direct-care nurses' experiences with medication error and associated effects, minimal established studies or background data exist by which this author can set benchmarking targets. The process/outcomes objectives for the capstone project included the following:

1. Obtain descriptive data via non-experimental, mixed methods survey instrument:
    a. Nurses' coping responses to stressful events such as a medication errors
    b. Nurses' experiences with medication errors in relation to degrees of patient harm

c. Impact on nurses' personal/professional identity as indicated by personal stories and perceptions of fear, shame, and guilt following a medication error experience
d. Nurses' preferred support interventions following a medication error experience.

2. Assess for correlations between coping responses and preferred support interventions, as well as between impact of medication error experience and coping responses.
3. Create recommendations for department management to use with staff experiencing distress following medication error events.

By identifying nurses' experiences with medication errors, assessing participant coping styles, and outlining preferred interventions for support following a medication error event, this author fulfilled the project goal of increasing awareness and understanding of medication error events and the impact on nurses as second victims. Through correlating direct-care nurses' experiences with medication error events with coping styles and support interventions, this author met the project goal to create recommendations for a formalized a support process for nursing management to utilize with nurses who experience a medication error event.

Logic Model

A logic model (Appendix D) served as a visual road map for planning, developing, and facilitating progress of the capstone project (W.K. Kellogg Foundation, 2004; White & Zaccagnini, 2011). The model started with identifying inputs/resources, constraints, and activities, and concluded with assessing planned outcomes (W.K. Kellogg Foundation, 2004; White & Zaccagnini, 2011).

Through dissemination and evaluation of a descriptive mixed methods survey instrument, this author sought to elucidate the prevalence of direct-care nurses experiencing distress following medication error and increase understanding of associated coping styles in order to

formulate recommendations for an effective, formalized, support process to address, and mentor, nurses in distress. Development of the capstone project's logic model was essential for project planning. Planning for the capstone project included identifying resources and constraints such as the survey instrument itself, garnering baseline medication error incidence within the organization, understanding and evaluating budgetary implications, having adequate workspace to meet with stakeholders and participants, planning the project implementation with risk management, nursing leadership, and quality improvement staff, and obtaining IRB approval for the capstone project from the clinical facility and academic institution.

After planning and implementing the survey instrument describing the prevalence of medication error and effects on personal or professional distress in direct-care nurses, this author used the logic model to outline outputs, outcomes, and proposed impact of the project (White & Zaccagnini, 2011). For the capstone project, outputs included evaluating and interpreting the survey results, developing a formalized process to address nurses' needs identified through the survey instrument, and nursing management and staff acceptance of the survey results and buy-in for creating solutions to the practice problem. Following the output, the expected short- and long-term outcomes included increasing nursing staff awareness of support following a medication error, increasing nursing management training and effectiveness to address nurses by means of the developed support recommendations, increasing staff awareness of medication errors, and enhancing medication safety throughout the organization.

Identifying impacts of the project was the last piece to the logic model (White & Zaccagnini, 2011). End-result impacts of the capstone project aimed to mitigate the impact on the health care organization – the third victim – from a distressed nursing staff who are

predisposed to increased burnout, decreased retention, and increased risk for committing additional adverse events due to the second victim phenomenon.

Design Methodology

Outcome measures are the ultimate goal of planning, implementing, and evaluating the capstone project (Kleinpell, 2009). Outcome measures for the capstone project included identifying the objectives to be examined and the methodology by which to conduct the assessment (Curry, Nembhard, & Bradley, 2009; Kleinpell, 2009). Specifically, this author wanted to examine adverse events and nursing staff functionality as nursing-sensitive outcome measures (Kleinpell, 2009). Through dissemination and evaluation of a descriptive, mixed methods, non-experimental survey instrument, this author sought to elucidate the prevalence of direct-care nurses experiencing distress following medication error events and increase understanding of participant coping styles in order to formulate recommendations for an effective support process to address and mentor nurses in distress.

The Instrument and Variables

Due to the paucity of instruments designed to describe nurses' experience with medication error and coping styles, this author devised her own survey instrument (Appendix E). The survey was a mixed methods (quantitative and qualitative) approach to describe the incidence and phenomenon of nurses' experience with medication error, participants' self-reported coping responses, and preferred support interventions following medication error incidence.

Survey instrument. The survey instrument is comprised of five components (Table 3). The participant self-reported coping style was measured using the Brief COPE inventory: a tool with established internal reliability, construct validity, and a broad application (Carver, 1997;

Polit, 2010). The Brief COPE inventory consists of 14 scales, each comprised of two questions, which assess a variety of adaptive and maladaptive, problem-focused or emotion-focused, coping responses (Carver, 1997). Carver (1997) used a reliability coefficient (a) set at .50 to measure internal consistency reliability for the 14 scales: Active Coping (a = .68), Planning (a = .73), Positive Reframing (a = .64), Acceptance (a = .57), Humor (a = .73), Religion (a = .82), Using Emotional Support (a = .71), Using Instrumental Support (a = .64), Self-Distraction (a = .71), Denial (a = .54), Venting (a = .50), Substance Use (a = .90), Behavioral Disengagement (a = .65), Self-Blame (a = .69). Participants were able to rate their coping response for each question on a continuous interval scale of 1 to 4, with 1 being "I would not do this at all" and 4 being "I would do this a lot" (Carver, 1997).

Table 3

Medication Error Experience Survey Components (Appendix E)

Component	Variable type	Measurement	Method	Outcome
Brief COPE (Carver, 1997)	Independent	Interval (Continuous)	Quantitative	Coping responses
Medication Error Index (NCC MERP, 2001)	Independent	Nominal (Categorical)	Quantitative	Experience with each category of medication error/ patient harm
Fear, Shame, Guilt (derived from Wolf et al., 2000)	Independent	Interval (Continuous)	Quantitative	Impact of medication error/patient harm on participant self-perception
Most memorable medication error impact on personal/professional self	Independent	Open-ended	Qualitative	Impact of error experience in own words
Preferred support intervention	Independent	Nominal	Quantitative	Desired support following medication error experience

Standardized definitions for medication errors, as set forth by the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP), were used in the survey instrument to assess participants' experiences with medication errors. The NCC MERP (2001) Medication Error Index classifies medication errors into nine levels of error and associated patient harm, ranging from the lowest level of error - Category A: *Circumstances or events that have the capacity to cause error* – to the highest level of error - Category I: *An error occurred that may have contributed to or resulted in the patient's death*. To assess the impact of the various categories of medication errors and associated patient harm on the participants' personal and professional selves, a Likert-type continuous interval scale of 1 to 10 was devised using three phenomenological themes (fear, shame, and guilt) prevalent in previous qualitative studies conducted by Wolf et al. (2000). Additionally, an open-ended qualitative question was included in this survey instrument to enable the study participants the opportunity to describe, in their own words, how their most memorable medication error experience affected their personal or professional identity.

In order to assess preferred support interventions following a medication error experience, a section was included in the survey instrument for participants to elect how they would seek emotional, psychological, or physical support. Using ten options currently available in the capstone project clinical facility, participants were able to specify how they would best feel supported following a medication error. Finally, a brief demographics section was included in the survey instrument to assess participants' years of experience in the profession and years of experience in their current role/department. Content validity for the compiled survey instrument was established by consulting with the multidisciplinary Safe Medication Practices Committee present at the project site.

Variables. Breaking the practice problem PICO statement down into independent and dependent variables assisted this author in properly formatting the survey instrument. The independent variable is the intervention being tested or identified (Houser & Oman, 2011; Polit, 2010). As the capstone project sought to generate knowledge of a phenomenological situation – specifically nurse experience with medication error at the project's clinical site - there is not a tested intervention as much as there is an identified understanding of an effect on the nurse following a medication error. Thus, the intervention that occurred in the capstone project was asking the participant to recall their personal experiences with medication error, personal coping responses, and preferred support interventions via the survey instrument.

The four independent variables of the capstone project's problem statement are contained within the survey instrument. The first independent variable is the coping style of the nurse participant as rated on the Brief COPE inventory developed by Carver (1997), which assesses 14 coping scales, broken down into 28 questions on coping activities, using an interval Likert-type scale of 1 to 4 (1 = I would not do this at all, 4 = I would do this a lot). The second independent variable is whether the nurse participant has or has not experienced a medication error in each of the nine NCC MERP (2001) Medication Error Index Categories A through I. The third independent variable is what impact each category of medication error, in which the nurse responded with an affirmative experience, had on the nurse participant as rated on a Likert-type scale of 1 to 10 in the subcategories of *fear, shame*, and *guilt*. Finally, the fourth independent variable is the preferred support mechanism for the nurse participant, as chosen from a list of ten available options present within the clinical facility, which subsequently was used in developing this author's recommendations for a formalized support process to employ with nurses experiencing a medication error event.

The dependent variable for the capstone project is the outcome being tested or identified by the aforementioned intervention (Houser & Oman, 2011; Polit,2010). Subsequently, the primary dependent variable for the capstone project was the categorized knowledge of the personal and professional impact of fear, shame, and guilt as measured effects of medication errors on direct-care nurses, participant coping styles, and preferred support interventions.

Sample Size

An effective sample size was fundamental to evaluating the effects of medication error on nurses at the clinical site. Consultation with a statistician available through the nursing research department at the clinical facility created recommendations for the capstone study to utilize a sample size of minimum 25 participants to have measurable data and reduce potential of a sampling error (Polit, 2010). Since there is no baseline information on nurses' experiences with medication errors at the clinical facility used for the capstone project, there was no point of comparison for the study data, thus a power analysis was not appropriate. Establishing statistical power is a measure employed for health outcome studies detecting differences between participants who receive or do not receive a specific treatment (Kane & Radosevich, 2011). Since the capstone project sought to describe the phenomenon of nurses in distress following medication error, there is no difference to detect.

The sample population of nurses working in a direct-care role within the hematology/ oncology/bone marrow transplant department (inpatient and outpatient) at the project facility was 115. This author, as principal investigator, recruited nurses for study participation through departmental staff meetings and email. This author distributed 82 surveys to nurses meeting eligibility for study participation, and 66 completed surveys were returned at the conclusion of the three-week study window, with a resulting 80.5% participation rate.

Validity and Reliability

With any research study, there exist potential threats to reliability and validity. Measurement error is a threat to validity that can occur in relation to differences in the abstract meaning of a concept (Lange & Jacox, 1993). In order to minimize measurement and sampling error of this sort, this author utilized standardized definitions of medication error and patient harm in accordance with the Medication Error Index (NCC MERP, 2001). Using a convenience sample is a threat to the external validity of the capstone study (Kane & Radosevich, 2011). A convenience sample, such as nurses working in a specific department within a clinical facility, may reduce the generalizability of the capstone project findings, as work-related stressors – such as patient acuity, staffing, workload – may be different from other departments within the same clinical facility.

Missing data is a threat to the survey instrument's reliability. As Kane and Radosevich (2011) state, "missing data threatens the integrity of outcomes research and greatly complicates statistical analysis" (p.308). Since the survey instrument was in a paper-based format, the survey was susceptible to voluntary submission or withholding of information by the nurse participants. These nurses may not have felt comfortable answering all the questions, thereby leaving the author with missing data on single or multiple data points. The first means utilized in handling missing data was by distinguishing what data was missing in order to assess its influence on descriptive results. As Lange and Jacox (1993) astutely identify, "persons for whom data are missing should not be assumed to be like those for whom data are available because individual differences may in fact be the reason why data are missing" (p.208). Thus, this author used dummy code variables as the optimal method to deal with a missing data point. The dummy code variables were numbers not used elsewhere in the data analysis for legitimate values (Polit,

2010). Using dummy code variables offered the author the opportunity not to impose researcher bias into the study while maintaining evidence that the participant chose to withhold an answer on the survey (Kane & Radosevich, 2011, Polit, 2010).

Human Subjects Protection

As principal investigator for the capstone project, this author maintained responsibility for ensuring participant confidentiality, consent, and voluntary participation (Kane & Radosevich, 2011). Human subject protection training was completed by the project team prior to the capstone project initiation (Appendix F). IRB approval from both the clinical site and the DNP student's university were obtained following expedited review (Appendix G). Consent to participate in the study was indicated upon participant completion and return of the survey instrument. No protected health information was collected from study participants and anonymity was guaranteed. Completed survey instruments were returned to the principal investigator via sealed, self-addressed, manila envelopes marked "confidential". Demographic information obtained was restricted to years of experience in the profession and in the participant's current practice setting.

One of the roles as investigator was to ensure no harm or suffering could come about to the subject resulting from partaking in the capstone project study. While involvement in the capstone project study would not pose direct harm or suffering to the participant, it was requesting the subject to bring forth personal feelings and potential reliving of their prior experiences with medication errors. Thus, the possibility existed that having the participants recall their experiences could indirectly cause them harm. In order to diminish potential harm, the subject maintained the option to withdraw his or her participation, and counseling resources were made available. This author upheld the imperative role to protect the human subject, allow

the participant the option to withdrawal involvement at any time without consequence, and to ensure all data obtained was secured, de-identified, and unable to pose potential future ramifications.

Data Analysis and Storage

Data analysis was completed using IBM SPSS Statistics Version 21 software program. Descriptive statistics were completed for the Brief COPE inventory, Medication Error Index, participant perceptions of fear/shame/guilt, and preferred support interventions. Correlational statistics were generated between coping responses and support interventions, and between coping responses and perceptions of fear/shame/guilt. The participants' hand-written answers for the qualitative question were transcribed into the software program, and then analyzed for recurring themes. All data entry into SPSS was conducted by the principal investigator and was reviewed following entry to ensure accuracy and reduce potential error. Missing data was coded using a dummy variable. Data was secured on a password-protected computer, and paper copies of the completed survey instruments were stored in a locked drawer in a secured office. All data will be maintained for a period of three years following study completion.

Project Findings and Results

At the time of the capstone project, there were 115 nurses working within the hematology/oncology/bone marrow transplant department at the clinical facility. Nurses were informed of the capstone project and invited to participate through departmental staff meetings and email. The survey instrument was distributed to 82 eligible nurses; 66 surveys were returned to the principal investigator by the conclusion of the three-week study window, resulting in an 80.5% response rate. Nurses in the sample (N= 66) had been professionally licensed from less

than one year up to 30 years (M = 8.33 years, SD = 6.48 years), and had been working in their current department between less than one year to 16 years (M = 4.38 years, SD = 3.47 years).

Coping Responses

The Brief COPE inventory was the tool utilized to assess study participants' coping responses to a stressful event, such as a medication error, using an interval scale of 1 to 4 (with 1 being "I would not do this at all" to 4 being "I would do this a lot"). The inventory is comprised of 14 coping response scales with two questions per scale. Descriptive statistics were calculated (Table 4).

Table 4

Brief COPE Central Tendencies

Coping Scale	Mean (*M*)	Standard Deviation *(SD)*
Active Coping	3.56	0.60
Planning	3.44	0.65
Use of Instrumental Support	3.38	0.71
Acceptance	3.25	0.60
Use of Emotional Support	3.12	0.75
Self-Blame	3.12	0.76
Venting	2.41	0.84
Positive Reframing	2.37	0.76
Religion	2.48	1.11
Self-Distraction	2.28	0.91
Humor	1.40	0.65
Substance Use	1.26	1.09
Behavioral Disengagement	1.16	0.42
Denial	1.15	0.40

Note. On a scale of 1 to 4, with 4 being "do a lot" and 1 being "not do at all".

The most prevalent coping responses among the sample population ($N = 66$), as measured by participant response "I would do this a lot", are Active Coping (question 2: $n = 37$, 56%; question 7: $n = 43$, 65%), Acceptance (question 20: $n = 37$, 56%; question 24: $n = 19$, 29%), Planning (question 14: $n = 36$, 55%; question 25: $n = 32$, 49%), and Use of Instrumental Support (question 10: $n = 34$, 52%; question 23: $n = 31$, 47%). The subjects report Use of Emotional Support and Self-Blame as the coping responses they would use "a medium amount" (question 5: $n = 28$, 42%; question 15: $n = 31$, 47%; and question 13: $n = 30$, 46%; question 26: $n = 28$, 42%, respectively) or "a lot" (question 5: $n = 25$, 38%; question 15: $n = 20$, 30%; and question 13: $n = 24$, 36%; question 26: $n = 21$, 32%, respectively). Conversely, study participants state they "would not do this at all" to four coping response scales: Denial (question 3: $n = 53$, 80%; question 8: $n = 62$, 94%), Behavioral Disengagement (question 6: $n = 58$, 88%; question 16: $n = 56$, 85%), Humor (question 18: $n = 41$, 62%; question 28: $n = 50$, 76%), and Substance Use (question 4: $n = 50$, 76%; question 11: $n = 55$, 83%).

Discussion. Folkman et al. (1986) define coping as "the person's constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the person's resources" (p. 993). Coping responses are generalized to be problem-focused coping, in which the aim is to solve the problem or alter the source of stress, or emotion-focused coping, which aims to manage or mitigate the emotional distress caused by the source of stress (Carver et al., 1989; Rassin et al., 2005). Coping responses present in the Brief COPE inventory categorized as emotion-focused include Denial, Positive Reframing, and Use of Emotional Support while problem-focused coping responses in the Brief COPE inventory include Planning, Active Coping, and Use of Instrumental Support (Carver, 1997; Carver et al., 1989). Additionally, coping responses can be classified as adaptive

or maladaptive (Carver et al., 1989). Examples of maladaptive coping from the Brief COPE inventory include Venting, Denial, Behavioral Disengagement, Substance Use, and Self-Distraction while Acceptance, Active Coping, Planning, and Use of Emotional/Instrumental Support are adaptive coping mechanisms.

The majority of the capstone study subjects report using adaptive and problem-focused coping responses when faced with a stressful situation, such as a medication error event, through the use of Active Coping ($M = 3.56$, $SD = 0.60$), Planning ($M = 3.44$, $SD = 0.65$), Use of Instrumental Support ($M = 3.38$, $SD = 0.71$), Acceptance ($M = 3.25$, $SD = 0.60$), and Positive Reframing ($M = 2.37$, $SD = 0.76$). Conversely, study participants report using maladaptive and emotion-focused coping mechanisms less frequently in the form of Venting ($M = 2.41$, $SD = 0.84$), Self-Distraction ($M = 2.28$, $SD = 0.91$), Substance Use ($M = 1.26$, $SD = 1.09$), Behavioral Disengagement ($M = 1.16$, $SD = 0.42$), and Denial ($M = 1.15$, $SD = 0.40$). Humor as a coping response, identified in the scale as making fun or joking about the situation, is reported to be minimally used by study participants ($M = 1.40$, $SD = 0.60$), which may be attributed to its close alignment with other maladaptive coping mechanisms such as Denial and Venting.

The prevalent use of Active Coping, Acceptance, and Positive Reframing by the capstone project study participants is supported by current literature evidence, which indicates taking responsibility for the personal and professional actions that contributed to the error occurrence is a positive coping strategy in second victims (Hall & Scott, 2012). Studies conducted by Meurier et al. (1997), Karga et al. (2011), Rassin et al. (2005), Schelbred and Nord (2007), and Treiber and Jones (2010) similarly demonstrate nurses' frequent use of adaptive, problem-focused coping mechanisms. Using adaptive coping skills assists nurses in overcoming their immediate negative reactions to the stressful medication error event, strengthens their ability to handle the

ensuing course of events, and aids in their ability to find meaning in their error event which may assist in future error prevention (Crigger & Meek, 2007; Karga et al., 2011; Meurier et al., 1997; Rassin et al., 2005; Schelbred & Nord, 2007). Contrarily, overuse of maladaptive and emotion-focused coping mechanisms, such as avoidance, denial, and repressing, have been linked in previous studies to development of PTSD and the inability to process feelings associated with the stressful event (Rassin et al., 2005). The infrequent use of Denial ($M = 1.15$, $SD = 0.40$) and Behavioral Disengagement ($M = 1.16$ $SD = 0.42$) in the capstone study subjects indicates the sample population is less at risk for the development of long-term distress effects from maladaptive coping responses following medication error events.

The frequent use of Self-Blame ($M = 3.12$, $SD = 0.76$) as a coping response by capstone study participants is similarly reported in the current literature. The two questions on the Brief COPE Self-Blame scale were *"I would criticize myself"* and *"I would blame myself for things that happened"* (Carver, 1997). Carver (1997) states self-blame following a stressful event such as a medication error foretells poor adjustment in response to stress. Treiber and Jones (2010) found "nurses typically blamed themselves for the errors, but also looked beyond the self in terms of error attribution" (p. 1331). Since self-blame can hold irrevocable repercussions on a nurse's professional identity, using rationalization for why the medication error occurred allows nurses to be the doer of the mistake while foregoing acceptance of blame (Treiber & Jones, 2010). Crigger and Meek's (2007) self-reconciliation process identifies self-blame as a component of the *reality hitting* stage, in which nurses compare their mistake-making actions to what is expected of the model nurse through social ideals or standards of care. If the erring nurses perceive their actions to be less than the social ideal – to do no harm and make no mistakes – they place increasing amounts of blame upon themselves and make self-deprecating

comments demonstrating their shame and loss of self-esteem (Crigger & Meek, 2007). Similarly, Hall and Scott (2012) proffer that emotionally distressing events make nurses feel as though they personally have failed their patients. Thus, the use of Self-Blame is supported as a common coping response among nurses and must remain a focus for nursing management to consider when providing post-event support in order to assist nurses in moving forward, creating self-understanding, decreasing culpability, and generating self-forgiveness following a medication error (Treiber & Jones, 2010).

Medication Error Experience

Study participants were asked to respond *yes* or *no* to their experiences with each of the nine categories of medication error (A through I) as defined in the Medication Error Index (NCC MERP, 2001). Missing data was coded as *no response,* and descriptive statistics were generated (Table 5).

Discussion. Participant response to the Medication Error Index assisted the capstone project team in understanding the breadth of the sample nurses' experiences with medication error and associated patient harm within the clinical facility. While one subject (1.5%) responded affirmative to a Category I medication error, the majority of participants' experiences with medication errors are within Categories A (91%), B (85%), C (79%), and D (33%) – errors not leading to patient harm. Medication errors resulting in temporary patient harm also have been experienced by the sample population (Category E, 14%; Category F, 4.5%). Many medications have the potential to cause harm to patients - even when being administered correctly. Furthermore, medication administration is a task essential in the direct-care nurse's job description, which places nurses at risk for experiencing various degrees of medication error

and patient harm throughout their career (Jones & Treiber, 2012; Treiber & Jones, 2010; Wolf et al., 2000).

Table 5

Medication Error Index Descriptive Statistics

	Category and definition	No		Yes	
		n	*f*	*n*	*f*
A	Circumstances or events that have the capacity to cause error	2	3%	60	91%
B	An error occurred but the error did not reach the patient	6	9%	56	85%
C	An error occurred that reached the patient but did not cause patient harm	10	15%	52	79%
D	An error occurred that reached the patient and required monitoring to confirm that it resulted in no harm to the patient and/or required intervention to preclude harm	40	61%	22	33%
E	An error occurred that may have contributed to or resulted in temporary harm to the patient and required intervention	52	79%	9	14%
F	An error occurred that may have contributed to or resulted in temporary harm to the patient and required initial or prolonged hospitalization	57	86%	3	4.5%
G	An error occurred that may have contributed to or resulted in permanent patient harm	60	91%	-	-
H	An error occurred that required intervention necessary to sustain life	63	96%	-	-
I	An error occurred that may have contributed to or resulted in the patient's death	61	92%	1	1.5%

Although the NCC MERP (2001) Medication Error Index provided objective, standardized definitions by which study participants were able to state their experience with medication errors and patient harm, participants would have used a subjective assessment of whether or not they had experienced each category of error. Hence, participants' interpretations of which category their error experiences fit into, through use of personal recall bias during category selection, was a limitation to this component of the survey instrument.

Perceptions of Fear, Shame, Guilt

Following their response to whether they had experience with each category of medication error in accordance with the NCC MERP (2001) Medication Error Index, study participants were asked to rate their perceptions of *fear, shame,* and *guilt* as indicators of each medication error category's effect on their personal and/or professional identities. A Likert-type scale of 1 to 10 (with 1 being "never" and 10 being "always") was utilized for the participant ratings of fear, shame, and guilt. Missing data was coded with a dummy variable, and descriptive statistics were generated (Table 6).

The results from the survey instrument indicate nurses experience varying degrees of fear, shame, and guilt resulting from the commission of a medication error. Participants report heightened perceptions of fear, shame, and guilt as evidenced by the mean ratings in Categories A (fear $M = 6.28$, $SD = 2.53$; shame $M = 4.70$, $SD = 2.77$; guilt $M = 5.42$, $SD = 2.88$) and I (fear $M = 9.24$, $SD = 2.24$; shame $M = 8.98$, $SD = 2.68$; guilt $M = 9.36$, $SD = 2.14$). As the medication error category and associated level of patient harm increased, so did the means. While the mode result for fear in Category A is "5" ($n = 14$) on a scale of 1 to 10, in Category I the mode is "10" ($n = 39$). Similarly, the mode result for guilt in Category A is "7" ($n = 10$) and at "10" ($n = 40$) for Category I. Conversely, participants show varying self-perceptions of shame

in medication errors without patient harm as there are multiple modes for Category A at "1" (n = 10), "2" (n = 9), "4" (n = 8), "5" (n = 8), and "6" (n = 8) and Category B at "3" (n = 9), "5" (n = 11), "7" (n = 8), and "10" (n = 7), while Category I has a single mode at "10" (n = 33).

Table 6

Effects of Medication Errors on Personal/Professional Self

Medication error category	Fear			Shame			Guilt		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
A	65	6.28	2.53	64	4.70	2.78	65	5.42	2.88
B	63	6.46	2.58	63	5.41	2.79	63	5.90	2.87
C	64	7.45	2.53	64	7.31	2.54	64	7.98	2.11
D	54	8.54	1.95	54	8.31	2.26	54	8.57	2.02
E	47	8.60	2.05	47	8.40	2.34	47	8.74	1.94
F	45	8.87	2.03	45	8.71	2.37	45	8.98	2.05
G	45	9.11	2.12	45	8.91	2.43	45	9.16	2.06
H	44	9.20	2.17	44	9.11	2.41	44	9.32	2.08
I	45	9.24	2.24	45	8.98	2.68	45	9.36	2.14

Note. On a scale of 1 to 10, with 1 being "never" and 10 being "always".

Discussion. Based upon the literature evidence present in qualitative studies conducted by Wolf et al. (2000), Meurier et al. (1997), Crigger and Meek (2007), and Karga et al. (2011), it was postulated that the capstone project nurses have elevated perceptions of fear, shame, and guilt following a medication error. Crigger and Meek (2007) state feeling fear, guilt, and shame are critical components to the *reality hitting* phase of the self-reconciliation process. Wolf and

colleagues (2000) found 98.5% (n = 396) of nurses reported feeling guilty following their medication error experience and 95% (n = 385) expressed being fearful. Meurier et al. (1997) reported 66% (n = 85) of nurses in their study expressed guilty feelings and 37% (n = 48) felt fearful in response to their errors. Additionally, Karga et al. (2011) revealed 44% (n = 236) of nurses in their study experienced guilt as an internal emotional reaction while 36% (n = 193) feared the impact on the patient, 14% (n = 74) were fearful of professional repercussions, and 22% (n = 116) feared losing coworkers' trust. Thus, the capstone study nurses' reports of *fear* and *guilt* following medication errors align with the frequency of these responses in previous studies.

Table 7

Correlations between Fear, Shame, and Guilt

Medication error category	Fear				Shame	
	Shame		Guilt		Guilt	
	r	*n*	*r*	*n*	*r*	*n*
A	.40	64	.39	65	.90	64
B	.44	63	.45	63	.85	63
C	.67	64	.69	64	.82	64
D	.74	54	.76	54	.82	54
E	.85	47	.84	47	.93	47
F	.74	45	.81	45	.96	45
G	.82	45	.86	45	.97	45
H	.79	44	.87	44	.92	44
I	.72	45	.88	45	.83	45

Note. $p < .001$.

Nurses' perceptions of fear, shame, and guilt are statistically significant ($p < .001$) for being positively correlated with each other through all nine categories of the Medication Error Index (Table 7). Positive correlations indicate as nurses' perceptions of fear increase so do their perceptions of both shame and guilt following medication error events. The correlations between fear and shame increase in magnitude with higher categories of medication errors and associated patient harm: Category A ($r = .40, p < .001$), Category D ($r = .74, p < .001$), and Category I ($r = .72, p < .001$). Similarly, the positive correlations between fear and guilt are stronger as the levels of patient harm increase with each category of medication error: Category A ($r = .39$, $p < .001$), Category D ($r = .76, p < .001$), and Category I ($r = .88, p < .001$). Interestingly, the positive correlations between shame and guilt are even stronger than those previously stated throughout all nine categories of medication error, often nearing a perfect positive correlation, such as in Category G ($r = .97, p < .001$). Thus, shame and guilt, as emotional and psychological reactions, are intertwined in the capstone study nurses as they evaluate the impact of the medication error on their personal or professional identities.

Bennett and Lowe (2008) discuss the manner in which nurses' cognitive responses to work-related events defined by them as distressing, such as committing a medication error, result in stress-related emotions. When the nurse blames him- or herself for the event, the emotional reaction is guilt (Bennett & Lowe, 2008). As corroborated by the elevated mean and correlation statistics for nurses' perception of guilt in the capstone project, the nurses' self-blame and ensuing guilt following medication errors are increased in errors in which a patient was harmed, as opposed to an error with no resulting harm (Vincent, 2006). Additionally, the elevated perceptions of guilt following medication error events substantiate the prevalence of Self-Blame as a coping response used by the capstone study population (Table 4).

A limitation to this component of the capstone survey instrument is the subjective definitions participants would have attributed to fear and shame. The words were not defined by the principal investigator for the participants; hence, they would have applied their own meanings when completing the survey. Nurses experience a variety of fear-based responses to medication error events: fear for the patient's safety, fear of being shamed or blamed by peers and physicians, fear of disciplinary action, and fear of feeling responsible for the error (Karga et al., 2011; White et al., 2008; Wolf et al., 2000). The mean results for nurses' perceptions of shame in experiencing each category of medication error were slightly lower in comparison to their perceptions of fear and guilt. Therefore, either the study participants were reporting less embarrassment, humiliation, and culpability following a medication error event, or they have decreased shame because they have heightened positive, adaptive coping responses in Active Coping and Acceptance (Table 4). Regardless of the reason, the participants indicate their self-perception of shame following a medication error event has an impact on their personal and/or professional identity.

Impact in Own Words

In order to enable study participants the opportunity to express the way in which they were affected by their most memorable medication error event, space was placed within the study instrument with the guiding statement, "*Please use the open space below to tell me in your own words how your most memorable medication error has impacted your personal/professional self.*" Presenting this open-ended question within the survey instrument for the capstone project afforded the study participants the opportunity to share their personal accounts of when a medication error happened to them, and enabled them to discuss a typically taboo subject matter in which they may not have previously had the opportunity to divulge their feelings. Forty-four

nurses completed the open-ended survey question. The accounts of their medication error experience were written in their own words; some provided descriptions of the error events while others merely provided the outcome experienced from the event. The medication error events depicted by the study subjects ranged from minor, near miss events up to serious, potentially life-threatening errors. Regardless of the actual content, each of the nurses' responses relayed what the medication error experience meant to them personally or professionally.

Content was analyzed to identify themes and meanings within the study participants' responses. Of great interest to this author, the capstone project participants' responses align directly with the symbolic themes found in Treiber and Jones' (2010) qualitative study conducted with 158 randomly selected nurses licensed in the state of Georgia. Treiber and Jones (2010) identify six themes prevalent among nurses' accounts of medication error events: "I'm to blame, but . . ." in which nurses admitted responsibility while attributing the cause to the error outside of the self; "being new" through which nurses lent inexperience as an excuse; "devastating reactions" following the error event; "dealing with fear" after committing a medication error; "frustrations with technology and regulations" leading to the medication error occurrence; and "lessons learned" as a result to experiencing the medication error. Similar to the capstone study participants' responses, the six identified themes in the Treiber and Jones (2010) study are interrelated, not mutually exclusive, and often overlap.

"I'm to blame, but . . .". Approximately 32% (n = 14) of the capstone study participants describe medication error events fitting the first theme centering on self-blame, and usually incorporated external causational attribution elements such as actions of others or the work environment. Example statements from the subjects include the following:

> "Mine was in nursing school, checks were put into place, but training RN was busy and only eyeballed quickly the digoxin I had drawn up. I drew up 3x the amount because of bad calculation. It has taught me to double and triple check dosing, even when busy;"
>
> "At change of shift I was rushing to get methotrexate started. It should [have] fluids with [bicarbonate] running and I failed to keep the fluids running. The next nurse did not notice that fluids were not running so the patient ran methotrexate for over 12 hours without [bicarbonate] fluids. He had to have [bicarbonate] boluses given and be monitored to make sure he did not have toxicity. I am now the #1 advocate for not hanging chemo at change of shift;"
>
> "I once administered a vitamin K shot to the wrong patient based off a verbal order. After the patient did not seem like an appropriate candidate, I double-checked with the [child's mother] to see if she was expecting vitamin K injection and confirmed she was. Afterwards, I questioned the MD as to why such an old child would be receiving vitamin K shot and we realized the mistake. I felt terrible, but it really drove home the importance of trusting my gut and not to be afraid to question things further;"
>
> "I was taking care of a newborn who needed a bolus of fluids. I set my pump to beep at the end of the bolus, but I forgot to follow up as I got busy. Someone restarted my pump at the rate of the bolus and didn't tell me. The baby got a second bolus. I have become more hypervigilant on following up on boluses or anything that needs a reassessment. I was pretty upset with myself and felt bad. I needed to do a lot of talking about it and eventually felt better;"
>
> "I will never forget what I learned from the error. I did understand that the error was related to numerous 'misses', not just me."

In each of the above statements, the subject found themselves culpable of the medication error event, but found someone or something else to carry some burden of the blame, thus enabling the subject to find meaning and forgiveness in their error event.

Being new. Approximately 16% ($n = 7$) of the study participants include in their personal accounts that they were either in nursing school, a new-graduate nurse, or new to their work environment when the medication error occurred. Example stories include the following:

> "During my first year of nursing I gave a dose of chemotherapy that had been verified by the MD but technically should not have been given based on the roadmap criteria. No harm came to the patient, but it greatly impacted my practice and my self-esteem as a nurse. I found solace by seeking support from staff and by joining a task force to prevent future errors;"

> "Giving a patient oral ativan via IV syringe in a PIV – horrible feeling. I was a new grad at an unfamiliar hospital – very shameful feeling;"
>
> "As a new grad I admitted a patient who needed to be set up with a PCA [patient-controlled analgesia]. I had never done one before. The unit was short-staffed, and the charge RN stated she was too busy and instructed me to find someone else to assist me. Due to the unit being short staffed there was no one around to help besides another new grad who also didn't have experience with PCAs. We thought we could figure it out, ended up putting the wrong concentration programmed in the pump, and the patient was underdosed. I was thankful that at least the patient was underdosed and not overdosed, but it opened my eyes as to how careful we need to be and how easy an error can happen;"
>
> "I had a med error while I was a nursing student because I let the staff nurse push me away from my double check in the med sheet so she could take the med cart – it was a huge eye opener for me. I was angry at myself for not standing up for what I know needed to be done and angry at the nurse for not taking the time with me to do the double check. It felt horrible;"
>
> "My very first med admin as a nurse and I programmed the pump wrong for lasix. Although it turned out to be a safe rate it made me always double check the rate and ask for help if I am unsure. I still feel anxious about med errors but make sure to take appropriate steps to ensure safety to the best of my ability."

In each of the participants' statements in which medication errors occurred while new to their nursing careers, the nurses offered up their novice role as rationalization for the error event and utilized the experience to generate personal rules by which they carried on in their practice.

Devastating reactions. Similar to the Treiber and Jones (2010) study, nurses in the capstone project report intense visceral reactions for relatively minor medication error events. Approximately 27% (n = 12) nurses describe immediate or prolonged emotional and physical reactions to their medication error; examples include the following:

> "I ran doxorubicin over 1 hour even though the protocol stated 15 minutes – 2 hours, but order stated 2 hours. Physician made me feel very guilty and made me feel as though I may have caused permanent heart damage;"
>
> "I think having a medication error has impacted me professionally by taking the time to slow down in busy/stressful situations (as this is when my errors have occurred). My errors have not affected my 'personal self' long term, but at the time I've felt guilty and my self-esteem decreased;"

> "My medication error did not result in harm to the patient. When I realized I made the error I was physically ill. It helped to talk with the doctors, pharmacist, NPs, and other nurses. This happened within my first year of nursing;"
>
> "My most memorable patient error involved a misprogrammed infusion that was potentially harmful, required lab levels to confirm patient safety, and was ruled to have caused no harm based on the labs. I still feel shame when I think about the event and I have never forgotten most of the details around the event, including who I talked to and what they said, and my follow-up conversation with my supervisor. In the professional setting I have tried to channel the event to be more focused about double checking pump rates. To some degree I never fully trust that I have gotten pump rates right, and often return to a room within a minute after leaving to check a third time;"
>
> "A certain medication error stayed on my mind for several weeks after the incident. It definitely affected my sleep (keeping me awake and waking up thinking about it). I had to talk about it a lot with co-workers to process the situation before I could stop stressing about it (this event did not cause harm to the patient but still impacted me greatly)."

Unlike the nurses in the Treiber and Jones (2010) study, the nurses in the capstone project were able to recall specific details of their medication error events and were able to impart the emotional memories associated with their errors as if they had just recently happened. The emotional reactions and recollections of physical distress following medication errors do not seem to be related to the severity of the error so much as to the fear of doing patient harm.

Dealing with fear. Treiber and Jones (2010) state one of the most prevalent devastating reactions following a medication error event was fear. Whether it is fear for the patient's safety, for the nurse's own professional persona, or of legal repercussions, fear was discussed as an event component in 20.5% (n = 9) of the capstone project nurses. Often, the personal stories incorporate reassurance that no harm occurred to the patient, which this author believes was a method by which the participants were able to find justification in their error events. Examples include the following:

> "I forgot to increase maintenance IV fluids while giving a chemo that could damage a patient's bladder. It made me aware how a simple mistake could possibly cause a lot of damage. It didn't, but it scared me!"

> "I gave a whole pill (muscle relaxer) instead of half. The patient got really sleepy and I was so scared but he was okay. I felt terrible and embarrassed;"
>
> "I have never actually given a patient an incorrect medication. I have drawn up an incorrect dose of ativan and morphine before but realized it before leaving the med room. It was terrifying to realize I could have given it to the patient. Thank God for double checks!!"
>
> "Scared me, made me know how important slowing down is;"
>
> "The reality of what we do always weighs heavily on my shoulders. The potential for error is very real. When an almost error occurs, or when a patient turns south I sometimes am afraid that it was something I did, can usually work through the situation, but is usually my first thoughts;"
>
> "Since my medication error I never administer a med unless I have checked it at least 3 times."

In the final example listed above, this author deduces the subject's experience to demonstrate the ongoing fear of potentially doing harm in the future. Unlike the Treiber and Jones (2010) study, none of the capstone project participants describe actions to cover up or maintain an illusion of no error having been made, which potentially connects with the participants' diminished use of maladaptive or negative coping responses such as Denial and Behavioral Disengagement.

Frustrations with technology and regulations. Less common as a theme in the capstone project subjects, compared to the Treiber and Jones (2010) study, was attributing the medication error events to technology, demands, and rules in the work environment. Approximately 7% ($n = 3$) subjects report technology as a factor in their medication error. One subject found meaning in his/her error event by "maintaining a sense of hypervigilance, understanding system vs. personal error", while another participant states the following example:

> "Programming an [epinephrine drip] (using the wrong concentration choice – programmed by pump) during a code situation – someone else switched the [epinephrine drip] pump – [it was] set up wrong and I didn't catch because I was multi-tasking – and instead of changing the syringe in the pump already there – a helper switched with a new pump with a new [drip] good to go."

In this case, the nurse attributes the medication error occurrence to pump issues, a frantic work environment during a code blue, and the other nursing staff who were providing assistance.

Lessons learned. The capstone study participants overwhelmingly utilized the open-ended question as an opportunity to convey the lessons learned and changes in practice initiated following their medication error experiences. Of the 44 nurses who completed the qualitative question, 26 subjects (59%) specify a way in which they found meaning in their error event in order to continue their nursing practice. Examples include the following:

> "After it first happened, I felt a lot of guilt and was embarrassed. I have now taken the experience and learned from it and have shared with others that have experienced the same thing;"
>
> "Almost making a medication error made me realize just how important double checking any medication is in the professional practice of nursing. I'm much more careful now than I was prior;"
>
> "Feel frustrated by the situation and start questioning my abilities. Question the situation that allowed it to occur and what can be done or put in place to prevent a future situation;"
>
> "I exercise greater caution, educate others;"
>
> "After making the error, I gave myself time to reflect. At first, I was down on myself, ashamed, and felt afraid that I could have harmed the patient. After some self-reflection, I was able to accept that it happened and to learn from my mistake. I am extra cautious and talking to other nurses on the unit I am able to see that mistakes happen, we just have to learn from them and try to do better next time;"
>
> "Made me realize that errors happen no matter how good the nurses are. It's more important to move on and learn from mistakes but it's so important to always know what a medication is for and how to give it correctly;"
>
> "I now take incomplete med orders very seriously (i.e. frequency not ordered) I will confront the MD and fill out [an incident report]. I read over chemo roadmaps multiple times and ask a lot more questions. I'm not afraid to take the appropriate amount of time even if it means chemo will be late. If I don't feel comfortable, I wait until things are clarified. I refuse to risk my patient's safety and my license because I feel undermined or demeaned by an MD."

As in the Treiber and Jones (2010) study, the capstone project subjects discuss the manner in which the medication error event ultimately generated a greater commitment to safe medication administration and knowledge on the risk of medication errors. Nurses depict their lessons learned from their experiences with medication errors as a method to find meaning in the event, gain closure in the dissonance from their idealized personal or professional image, and move forward in their nursing career. As found within the Crigger and Meek (2007) self-reconciliation process, creating lessons learned from an error event offers nurses a way to find resolution in having made a mistake in their clinical practice in order to survive or thrive in their future nursing careers.

Preferred Support Interventions

The ten support interventions currently available within the clinical facility were listed on the survey instrument. The study participants ($N = 66$) were asked to choose which interventions would assist them best in feeling supported following a medication error. Answers were inputted as *yes* or *no* for data analysis, depending on whether or not the intervention option had been selected. Descriptive statistics were generated (Table 8).

The data demonstrates the capstone study participants prefer to use discourse with someone at the clinical site, at the time of the error event, as opposed to days later, as their source of emotional and psychological support. Seventy-one percent of the capstone study participants state their preferred support intervention following a medication error event is to "talk about it with peers at work" ($n = 47$). Additionally, approximately 58% ($n = 38$) of nurses want to talk about the error with their supervisor, and 26% ($n = 17$) of nurses will find solace if they talk about their medication error with their family. Physical support to deal with their emotional and psychological responses in the form of being allowed to take a break from patient

care is preferred by 32% (n = 21) of the capstone project nurses; while six (9%) nurses state they would want to go home following a medication error event.

Table 8

Preferred Support Interventions Descriptive Statistics

Support intervention	No		Yes	
	n	*f*	*n*	*f*
Talk about it with peers at work	19	28.8%	47	71.2%
Not talk about it at work at all	65	98.5%	1	1.5%
Talk about it with my family	49	74.2%	17	25.8%
Enable me to take a break	45	68.2%	21	31.8%
Enable me to go home	60	90.9%	6	9.1%
Talk about it with my supervisor	28	42.4%	38	57.6%
Talk with Wellness Team	66	100%	-	-
Interprofessional post-event review	56	84.8%	10	15.2%
Resilience Education Support Team (REST) emergent visit	64	97%	2	3%
Employee Assistance Program	63	95.5%	3	4.5%

Note. N = 66.

Discussion. Finding emotional and psychological support from colleagues, friends, and family is substantiated by current literature evidence (Karga et al., 2011; Wolf et al., 2000). Meurier and colleagues (1997) revealed of nurses in their study (N = 536), 66% felt the need to discuss their error with colleagues and charge nurses while 24% discussed the error event with spouses or significant others. Additionally, of the 95 health care professionals surveyed by Edrees et al. (2011), 64% list using formal and informal emotional support as their desired

supportive strategies following an error event. The capstone project participants' preference to hold discourse with family, peers, and supervisors following a medication error event indicates they are seeking immediate emotional and psychological support from trusted individuals in a safe environment.

Interestingly, only five capstone study participants (7.5%) wish to utilize the Employee Assistance Program (EAP) and the Resilience Education Support Team (REST) emergent visit, both of which are formalized support systems currently in place at the clinical facility. EAP is an off-site service, in which nurses would be referred to psychological counseling in their geographic area days or weeks after the stressful event, and REST emergent visits utilize a team comprised of social work and spiritual care professionals specially trained to provide debriefing following a stressful event. Additionally, none of the participants chose "talk with the Wellness Team" as their preferred support mechanism. The Wellness Team is a department-based group of multidisciplinary health care professionals (psychologists, social workers, child life therapists, spiritual care) who would be available to counsel the nurses in distress. To this author, the nurses indicating the REST visit, EAP, and Wellness Team are less desired support measures directly relates to the nurses preference to speak with colleagues and supervisors following a medication error who are already known to the erring nurse and are already present within the nurse's work setting.

Ten of the capstone project participants (15%) state they would find an interprofessional post-event review helpful following their medication error event. The post-event review process incorporates multidisciplinary health care professionals working in patient safety, risk management, and quality improvement at the clinical facility convening to review and discuss the case with the erring nurse. The post-event review process generally is reserved for

incidences with moderate to severe patient harm, and occurs a few days or weeks following the event. This author believes nurses would prefer this support intervention for the reason that it would assist the nurse in debriefing after the incident, and ultimately facilitate the nurse through the self-reconciliation process.

The capstone study participants' preference to take a break from patient care or go home following a medication error incident is supported by current literature evidence. Scott and colleagues (2010) found the most frequently reported feature of an effective support program was to allow access to "institutionally sanctioned respite away from the care environment immediately after an event to allow the second victim to compose him- or herself before resuming patient care" (p. 235). Since nurses exhibit immediate emotional, physical, and psychological reactions to committing an error, allowing nurses protected time to work through their feelings and calm down before returning to patient care will assist the nurse in reconciling the error as well as reduce the risk of the nurse committing additional errors due to distraction and heightened stress (Crigger & Meek, 2007).

Correlations

Pearson's *r* correlation statistics were generated to investigate potential relationships between the capstone project subjects' coping responses and perceptions of fear, shame, and guilt (Table 9), as well as between selected coping responses and preferred support interventions (Table 10).

As evidenced by the statistics presented in Table 9, of the prevalent coping responses reported by the study subjects (Use of Emotional Support, Use of Instrumental Support, and Self-Blame), there are negligible to very weak correlations with nurses' perceptions of fear, shame, and guilt. Use of Emotional Support as a coping response is statistically significant for a weak

positive correlation with fear in medication error Category A ($r = .28, p < .05$). Similarly, Use of Instrumental Support as a coping response is statistically significant for a slight positive correlation with guilt in medication error Category D ($r = .03, p = .05$). Finally, the coping response Self-Blame holds statistically significant, though negligible, positive correlations with guilt in medication error Category D ($r = .26, p = .05$). The rest of the correlations between coping responses and nurses' perceptions are statistically insignificant. Therefore, this author concludes nurses' perceptions of the impact of medication errors on their personal and professional identities, as indicated by fear, shame, and guilt, is independent of their identified coping responses.

Table 9

Correlations Between Coping Responses and Nurses' Perceptions

Nurses' perception (per medication error category)	Use of emotional support		Use of instrumental support		Self-blame	
	r	*p*	*r*	*p*	*r*	*p*
Fear (A)	.28	.02	- .06	.62	.13	.29
Fear (D)	.24	.08	- .02	.90	.24	.09
Fear (I)	.17	.27	- .05	.75	.10	.51
Shame (A)	.03	.82	.14	.29	.07	.59
Shame (D)	.19	.17	.01	.97	.24	.08
Shame (I)	.17	.27	- .05	.77	.06	.69
Guilt (A)	- .02	.90	.14	.27	- .02	.90
Guilt (D)	.11	.43	.03	.05	.26	.05
Guilt (I)	.04	.78	- .09	.56	.11	.47

Note. Sample size per medication error category: Category A, $n = 65$; Category D, $n = 54$; Category I, $n = 45$.

Correlation statistics between capstone project participants' coping responses and preferred support interventions demonstrate equally statistically insignificant or weak

relationships (Table 10). As discussed previously, the capstone project nurses select talking about their medication error experiences with family as a preferential source of emotional and psychological support, which is supported through a slightly positive, statistically significant correlation with the Use of Emotional Support as a coping response ($r = .24$, $p = .05$). A statistically significant, very weak negative correlation exists between coping through Use of Instrumental Support and talking with a supervisor as a support intervention ($r = -.25$, $p < .05$), which indicates nurses might avoid conversations with their supervisors when seeking help or advice from others. Finally, nurses who demonstrate Self-Blame as a coping response are statistically significant for being somewhat more likely to prefer talking with their supervisors following a medication error event ($r = .28$, $p < .05$), compared with talking to peers or family as sources of emotional and psychological support.

Table 10

Correlations Between Coping Responses and Preferred Support Interventions

Coping response	Talk about it with peers at work		Talk about it with my family		Talk about it with my supervisor	
	r	*p*	*r*	*p*	*r*	*p*
Use of emotional support	- .07	.56	.24	.05	- .10	.41
Use of instrumental support	.03	.83	.19	.12	- .25	.04
Self-blame	.03	.84	- .07	.59	.28	.02

Note. $n = 66$ for all correlations.

Although the correlation statistics demonstrated negligible or insignificant relationships between nurses' perceptions of fear, shame, and guilt, coping responses, and chosen support interventions, the abundance of data otherwise gathered in the capstone project study reveal

nurses' experiences with medication error in the clinical facility affect them personally and professionally.

All of the nurses in the study ($N = 66$) have experienced some form of medication error - ranging from an environment in which an error could occur (Category A) to an error occurring resulting in patient death (Category I). The medication errors and associated degrees of patient harm have affected them personally and professionally as evidenced by their perceptions of fear, shame, and guilt, as well as their personal error experiences recounted within the survey instrument. In order to facilitate their self-reconciliation process following a medication error, nurses in the capstone study utilize positive, adaptive coping responses more predominantly than maladaptive reactions. Additionally, the study nurses identify open, empathetic, and accessible conversations with colleagues, family, and supervisors as the optimal source of support in assisting them to reconcile their medication error event.

In summary, data analysis of the subjects' responses to the comprehensive, mixed methods, non-experimental survey instrument through descriptive and correlational statistics collectively demonstrate nurses experience emotional, psychological, and physical distress following medication errors, and require effective support interventions to assist them through the error reconciliation process. The PICO question set forth at the start of the capstone project was: in direct-care nurses working in pediatric hematology/oncology/bone marrow transplant at a metropolitan, non-profit, tertiary care hospital in the Rocky Mountain Region, will analysis of a survey assessing nurse experience with medication error types, coping responses, and preferred support intervention following medication error experience, as compared to no baseline data, provide evidence that nurses experience distress and have unmet support needs following medication error occurrences? The resounding answer is yes - the second victim phenomenon is

present in direct-care nurses working in the selected department in the clinical facility, and nursing leadership needs an effective support program to utilize for nurses experiencing medication errors.

Limitations

Limitations exist to the capstone project study. In addition to those previously mentioned, using a self-developed survey instrument compiled of established and non-established components presented a limitation to establishing content reliability. Although the NCC MERP (2001) Medication Error Index provided standardized definitions for medication error categories, the definitions without examples may have restricted participants' ability to apply personal situations to each of the specific categories. An additional limitation is the potential for participant recall bias when completing the survey instrument. The nurses were reflecting on medication errors that may have been made many years prior; the details of the event or the scale of their emotional, physical, and cognitive reactions may have been magnified or diminished through the recall process. Schelbred and Nord (2007) acknowledged nurses are reluctant to report medication errors unless there is "obvious harm" to the patient (p. 318). Although the informed consent stated potential subjects will remain anonymous and all responses will remain confidential, participants may have modified the severity of their medication error experiences due to fear of repercussions or shame at divulging their errors.

Similarly, there is an element of self-selection bias for the nurses who chose to participate in the capstone project. Sixty-six out of 82 subjects who received a survey instrument elected to share their medication error experiences with this author, thereby demonstrating both the prevalence of medication error incidences and the urge to tell their personal stories. An additional limitation to the capstone study is the use of a high acuity clinical setting, which poses

potential non-generalizability to lower acuity departments within the same clinical facility. Finally, due to the specifics of the department and clinical facility used in the capstone project, there exists a potential inability to generalize findings outside the clinical facility.

Recommendations and Implications for Change

As demonstrated by the evidence generated in the capstone project, the impact of medication error events on direct-care nurses is a significant practice-based problem warranting nursing leadership's prompt attention. Department leadership needs to enact adequate support mechanisms to provide effective care for the caregiver: to facilitate supporting and mentoring nurses, as second victims, through their personal and professional distress following medication error experiences (Edrees et al., 2011; Hall & Scott, 2012; Scott et al., 2009; Scott et al., 2010; White et al., 2008; Wolf et al., 2000). Thus, this author recommends developing a formalized support process that includes resources to increase staff awareness and understanding of the second victim phenomenon in nurses and methods nurses use to reconcile their medication error events, and guidance in communication skills for supervisors to utilize with nurses in distress.

The first component of the formalized support process will be enhancing staff awareness on the impact of medication errors on nurses within the department to order to increase understanding of the associated self-blame and guilt nurses attribute to their erring actions. By providing a foundation of understanding on the second victim phenomenon, nurses will be better prepared to support their peers when an error event occurs, as opposed to potentially isolating, making assumptions about, or passing judgment upon the erring nurse. Having baseline knowledge of error experiences among nursing staff promotes peers' ability to center their focus on the nurse in distress as opposed to the error event itself, and facilitates empathetic caring and comforting behaviors between staff. This author recommends initiating information

dissemination through department newsletters and staff meetings, and continuing the diffusion of knowledge through quarterly conversations with nursing staff.

The second component for the formalized support process will be developing education on effective communication techniques for nursing leadership and staff to use with nurses in distress. The capstone project vision was for nursing leadership to be able to provide respectful, timely, compassionate, and confidential access to emotional and psychological support for nurses involved in error events. The capstone study identified nurses seek discourse with peers, family, and supervisors as optimal sources of support and assistance in reconciling their medication error event. Accordingly, nurses crave open, empathetic, and accessible conversations with colleagues, friends and family, and their supervisors – people they know and with whom they previously have established a trusting relationship.

Conversations with their trusted sources enable nurses to openly discuss their error event, divulge their feelings, and receive validation of the error's impact on their personal or professional identity. Additionally, the erring nurses need to hear that their peers and supervisors have not lost confidence in their ability to provide safe patient care and adequately perform their job functions. Employing the caring concept of maintaining belief in the erring nurse will be one of the most effective communication techniques nursing leadership and peers can utilize to propel nurses through their error reconciliation journey. Providing education on what to say during these crucial moments of open communication will assist nursing leadership in being ready to support the nurse in distress. Edrees and colleagues (2011) identify helpful key phrases to provide emotional support while initiating a dialogue with the nurse in distress, including: asking if the nurse is okay or going to be okay, thanking the nurse for sharing, reminding the nurse these things happen to all nurses, offering a personal story of a similar event to the nurse,

and telling the nurse he or she is still a good nurse. Conversely, avoiding conversation with nurses in distress through saying nothing, or passing judgment through negative phrases, such as *what were you thinking?*, are harmful communication techniques that must be avoided as they further isolate and alienate the erring nurses (Edrees et al., 2011). Providing emotional support to colleagues following an error event, particularly one resulting in patient harm, can be a challenging task. However, having resources outlining effective communication techniques for nursing leadership and staff will aid in commencing the support and mentoring process for nurses as second victims.

This author's recommendation to implement a formalized support process for nurse second victims serves as an implication for change within the organization used as the clinical facility for the capstone project. The evidence within the literature and capstone study data implicate the organization is at risk of being a third victim of medication errors. If a process is not implemented to enhance awareness, understanding, and resources for supporting nurses experiencing distress resulting from medication error events, the organization could experience financial impacts from error events including staff turnover and additional patient harm at the hands of a nurse who has lost personal and professional confidence.

Additional studies are needed to inform the organization of their risk as a third victim of medication error events, and to identify further the overall second victim phenomenon among diverse departments within the clinical facility. This author believes there is some existing element of effective emotional and psychological support by departmental and organizational leadership prior to the capstone project since nurses indicate the use of interprofessional post-event reviews and talking with supervisors as two forms of preferential support following an error event. Therefore, a final recommendation is to conduct additional studies within the

clinical facility to examine whether there are further implications for change in the existing culture of safety present within the organization.

Conclusion

Nurses' experience with medication error is a phenomenon that poses significant personal and professional tolls and consequences for the patient, the caregiver, and the organization. By identifying nurses in distress following medication error as a significant practice-based problem, this author devised a capstone project aimed at preventing harm to direct-care nurses. The evidence generated through a descriptive, non-experimental survey instrument detailed the prevalence of the emotional, physical, and cognitive distress reactions in nurses following medication error events, identified nurses' coping responses, and outlined nurses' preferred support interventions to assist them through the error reconciliation process. Through creating understanding of the second victim phenomenon and developing effective support recommendations for departmental and organizational leadership to employ with their nurses, this author seeks to reduce the possibility of a devastating event, such as the one in Seattle in 2011, occurring at the tertiary care pediatric hospital used in this capstone project.

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Appendix A

Systematic Review of Evidence

Article Title and Journal	Author/Year	Database and Keywords	Research Design	Level of Evidence	Study Aim/ Purpose	Population Studied/ Sample Size/ Criteria/ Power	Methods/Study Appraisal/ Synthesis Methods	Primary Outcome Measures and Results	Author Conclusions/ Implications of Key Findings	Strengths/ Limitations	Funding Source	Comments
Human error theory: Relevance to nurse management *Journal of Nursing Management*, *17*(2), 193-202	Armitage, G. (2009)	CINAHL with Full Text; *human error theory, health care errors, nurse management*	Concept analysis	Level V	Describe, discuss, and critically appraise human error theory and consider its relevance for nurse managers	n/a	Integrative Review	Concept of error, complexity and causation of error, blame, defenses against error, and relevance of human error theory to nurse management for incident analysis and feedback to staff.	Managing and learning from error can be better achieved with an understanding of the roots, nature, and consequences of error. This understanding can provide a helpful framework for a range of risk management activities.	Published works reviewed were mostly published in the fields of cognitive psychology and human factors	none noted	Good background information source about concept of error, human error factors, and blame. Reason's Human Error Theory. European Incorporate human error theory into reason medication errors occur and how to address staff experiencing medication errors.

Nurses' medication errors Journal of Advanced Nursing, 19(3), 519-526	Arndt, M. (1994)	CINAHL with Full Text; medication errors, nurses	interpretive design using discourse analysis	Level VI	The meaning the experience of having made a medication error has for a nurse	Nurses in Germany, Scotland, and England

Two group discussions (Germany & Scotland), Unstructured interviews (Scotland), Written self-reports (Germany, England, & Scotland), Review of 6 cases in UK Professional Conduct Committee	Five Themes: the procedure of dealing with medication errors, the role of the medical staff, the image of the nurse and of nursing, the situation of student nurses, support in the situation of medication error; Three Key Issues: Subjection and power, guilt and shame, learning from mistakes. Describes a self-initiated comparison of one's personal ideal and the reality of making error in practice, consequence of negative effects on one's self and self-esteem.	Medication error and the personal involvement had to be assimilated and lived with ; the traumatic experience of having been involved in medication error was counteracted by colleague support; disciplinary action better focused on situation and not person responsible	Did not specify results by geographic region or which results came from which study methods	Commission of the European Council, World Health Organization, Robert Bosch Stiftung (Stuttgart, Germany)	Old qualitative study, but provides fundamentals applicable today. European/UK. Incorporate study data into background assessment/literature review.

Research in practice: How drug mistakes affect self-esteem, Nursing Times, 90(15), 27-30	Arndt, M. (1994)	CINAHL with Full Text; Medication administration, staff support, nurse attitudes	interpretive design using discourse analysis	Level VI	Meaning of medication error and how they are dealt with at individual, institutional, and professional levels.	Nurses in Germany, Scotland, and England with at least 3 years experience; 63 different situations analyzed

Two group discussions (Germany & Scotland), Unstructured interviews (Scotland), Written self-reports (Germany, England, & Scotland), Review of 6 cases in UK Professional Conduct Committee	Five Themes: the procedure of dealing with medication errors, the role of the medical staff, the image of nurse and of nursing. The situation of the student nurse, support after medication error	Identifying the five themes helps in understanding the actions and reactions that frequently follow medication error, especially the role of disciplinary procedures. Analyzing the nurse experience assisted in improving medication administration procedures in the hospitals.	Article was a recap of the author's other publication of same year, did not specify how author concluded quality improvement work in hospitals.	none noted	Modified publication of article #2. Incorporate study data into background assessment/literature review.

Management of drug errors, Nursing Times, 90(15), 30-31	Booth, B. (1994)	CINAHL with Full Text; Medication errors, drug administration, disciplinary procedures, quality assurance	Editorial	Level VII	Propose drug error classification system as means to evaluate error and required disciplinary action	n/a

Integrative Review	n/a	Drug error classification systems offer an equitable system to score medication error occurrence.	Broad overview of a means to address the disciplinary component for management	none noted	More applicable to addressing disciplinary action as opposed to supportive actions. UK; obtained this article because it was attached to the library printout of article #3. Incorporate into management's handling of nurses experiencing medication error.

Emotions and their cognitive precursors: Responses to spontaneous stressful events among hospital nurses, Journal of Health Psychology, 13(4), 537-546.	Bennett, P. & Lowe, R. (2008)	CINAHL with Full Text; Nurse, occupational stress, coping	Descriptive, qualitative survey	Level VI	Identify types of situations nurses label distressing at work, examine nurses emotional response to those situations, examine relationships between identified emotions	Sample of nurses in two British city centre teaching hospitals chosen by picking every 10th name on nursing staff lists. N=340, n=107 female participants

Descriptive questionnaire survey: brief description of the most stressful work-related incident in the previous month, emotions, and coping (emotion-focused and problem-focused).	Frustration, anger, and anxiety rated as three strongest emotions, Emotions were correlated with themes (bivariate analysis, Pearson's correlation, and multiple regressions)	Most of the stressful situations reported stemmed from social or interpersonal factors, frustration and anger were the two most reported emotions, nurses generally felt able to cope well with situations they faced.	Did not evaluate chronic, repeated, negative emotional responses to daily hassles and long-term distress.	none noted	Good descriptive, mixed-methods survey on stress-event reactions (good statistical analysis). Did not specify medication administration-associated stress. UK. Incorporate data into background assessment of population/literature review.

Antecedents of severe and nonsevere medication errors, Journal of Nursing Scholarship, 4(1), 70-78	Chang, Y. & Mark, B. (2009)	CINAHL with Full Text; Nurs*, medication, nurse experience	Longitudinal design, 6 month data	Level VI	Examine nursing unit characteristics contributing to medication error at acute-care hospitals and investigate whether medication errors of different levels of severity have different antecedents.	286 nursing units in 146 randomly selected US hospitals. RNs employed on their units for more than 3 months were eligible (N=1671)

Three questionnaires distributed at months 1, 3, 5. DV= medication errors, IV= work dynamics, RN hours, communication w MDs, nursing expertise, education level, experience, medication-related support services, patient's age, and health status.	Severe med errors: occur mean 0.61 per month, nonsevere med errors: occur mean 3.86 per month; significant nonlinear relationship between severe med error and nurses' education level ($p<0.01$).	Severe and nonsevere medication errors may have different antecedents. Error prevention and management strategies should be targeted to specific types of medication errors for best results.	Medication error data dependent on nurse reports, classification of severe or nonsevere may differ between institutions,	National Institute for Nursing Research, American Nurses Foundation, Sigma Theta Tau.	Good statistical information for causes of medication error and demographic differences. USA. Incorporate study data into background assessment/literature review.

Alleviating "second victim" syndrome: How we should handle patient harm, Journal of Nursing Care Quality, 27(1), 1-5.	Clancy, C. (2012)	CINAHL with Full Text; Second victim, safety, nurse	Concept analysis	Level V	Discuss the health care provider as a second victim following adverse events, discuss systematic reporting and disclosure of adverse events.	n/a

	Integrative Review	Work is being done to enhance patient safety systems, promote culture of safety that focuses on the role of systems and de-emphasizes blame.	Our culture is one of caring, but also of heroism, which often does not tolerate the idea of victimhood. Until we achieve a harm-free health care system, we need to acknowledge there are ways to handle harm that mitigate the damage to both the victim and the second victim.	Generalized review of Scott, et al. and Wu publishings.	none noted	Did not contribute much novel information. USA. Incorporate study data into background assessment/literature review.

Always having to say you're sorry: An ethical response to making mistakes in professional practice, Nursing Ethics, 11(6), 568-576.	Crigger, N. (2004)	CINAHL with Full Text; Errors, ethics, nursing practice, mistakes	Concept analysis	Level V	Explore the conceptualization of mistakes and ethical response to making a mistake.	n/a

Integrative Review	Making mistakes in a world where the perception of health care providers is perfection can be a devastating experience to a nurse who has erred. Belief in personal failure leads to erosion of self-esteem and moral conflict	Proper handling of a mistake in health care practice can lead to positive growth experience for individual involved as well as others through disclosing the error, apologizing, and making amends.	Good overview, did not break down specific references as a review.	none noted	Good discussion on mistakes in practice and emotional/ethical impact on nurses. USA. Incorporate study data into background assessment/literature review.

Two models of mistake-making in professional practice: Moving out of the closet, Nursing Philosophy, 6(1), 11-18.	Crigger, N. (2005)	CINAHL with Full Text; Nurse error, mistakes, coping, patient safety	Concept analysis	Level V	Evaluation of two models depicting explanations for the origin of mistake-making in nursing practice: Perfectibility Model and Faulty Systems Model.	n/a

	Integrative Review	The Perfectibility Model holds that any error or harm is caused by an individual practitioner's lack of motivation or knowledge. The Faulty Systems Model offers a broader explanation of human error by looking at both system-related and individual causes.	The Faulty Systems Model offers a more comprehensive and effective means of managing mistakes in practice. It also increases the discussions on error and facilitates helpful coping mechanisms.	"More studies of the psychological, spiritual, and moral impact that mistake-making has on nurses would help our discipline deal with nurses who suffer from the impact of making mistakes"	none noted	Good discussion on two causes of error-making, indicates coping and distress issues in nurses who make mistakes. No direct discussion on medication error. USA. Incorporate study data into background assessment/population/literature review.

Towards a theory of self-reconciliation following mistakes in nursing practice, Journal of Nursing Scholarship, 39(2), 177-183.	Crigger, N. & Meek, V. (2007).	Academic Search Premier; Mistakes, nursing errors	Grounded Theory	Level VI	To explore nurses' responses to making mistakes in hospital-based practice in the US	10 nurses described 17 personal mistakes, nurses practicing in hospitals or in other practice settings
Health care workers as second victims of medical errors, Polskie Archiwum Medycyny Wewnetrznej, 121(4), 101-107.	Edrees, H., Paine, L., Feroli, R., & Wu, A. (2011).	MEDLINE; Second victim, adverse event, error	Descriptive qualitative	Level VI	The aim of the study was to emphasize the importance of support structures for second victims in the	A convenience sample of health care workers in various professions and different institutions within Johns Hopkins Medicine attending a Patient

Theoretical sampling, semistructured interviewing w taped interviews; Investigator triangulation was used to increase credibility of data	Results coded and categorized, yielded basic core category or the social-psychological process of "self-reconciliation". Four phases: Reality Hitting, Weighing In, Acting, Resolving. The culture of denial, shame, and blame was evident in the nurses' responses.	Self-reconciliation stages can be time-oriented/sequential or discursive. Emotions identified following error incident include fear, anger toward self or others, disbelief or denial. Not all mistakes are reported or disclosed. Description of nurses' struggles to meet personal and social ideals.	Further studies needed to determine what happens once a mistake or near mistake is discovered and in the area of mistake event management. First step toward developing a robust middle-range theory.	none noted	Cognitive dissonance (Festinger, 1957). Good qualitative study. USA. Incorporate cognitive dissonance theory into reason medication errors occur and how to address staff experiencing medication errors.
A two-part cross-sectional survey: first part paper-based, second part online. Format was multiple choice and free text.	Part I aimed to assess awareness of the second victim issue and health care workers' personal experience. Part II aimed to identify supportive strategies that employees	Results reinforce the importance of health care workers as second victims of serious adverse events. Lack of general awareness of "second victim" concept. Wide	Convenience sample of meeting participants, subject response rate decreased between part I and part II of survey. Population was 46.3% RNs, 11%	none noted	Uses findings from MITSS (Medically Induced Trauma Support Services) to devise support structure at Johns Hopkins. USA. Use in planning intervention to address impact of medication errors on nursing staff.

					handling of patient adverse events and in building a culture of safety within hospitals.	Safety Summit meeting, N=350. 46% RNs.

	would like to see offered within the health system. Part II also included an existing tool: the MITSS survey to allow respondents to rate the current support structure for employees who experience an adverse event. 66% of respondents experienced problems such as anxiety, depression, or concern about ability to perform the job following an adverse event. 69% reached out for support or talk to someone about the incident.	agreement that second victims needed a sense of compassion, support, and understanding following an adverse event. Employees rarely utilized existing supportive infrastructure due to perceived cultural stigma relating to mental health that is associated with seeking institutional services.	Nurse Manager/Charge Nurse. Results are being used to establish a peer-support program for health care providers to access.			

A new perspective on blame culture: An experimental study, Journal of Evaluation in Clinical Practice, 18(3), 671-675.	Gorini, A., Miglioretti, M., & Pravettoni, G. (2012)	Academic Search Premier; Nurses, error, attitudes	Descriptive experimental	Level VI	To increase understanding on the culture of blame and fear of punishment in medicine and nursing.	249 health care workers in three public hospitals in Northern Italy (38 MDs, 11 med students, 127 nurses, 73 nursing students).

"Medical staff/Nursing staff questionnaires regarding error reporting" developed by Bussone and Belknap. The two questionnaires seek current state of error detection at work and perceptions about the possible consequences of the error by means of two scenarios and four sub-scenarios. Answers recorded on 5-point Likert scale, 24 items total.	Measures included Punishment and Blame in the various scenarios. T-test analysis showed that the fear of being blamed is significantly higher than the fear of being punished ($P<0.001$). ANOVA analysis on participant subgroups and gender: Nurses show a higher fear of being punished compared with medical students ($P<0.01$) and physicians ($P<0.001$)	Fear of being blamed is assumed to do more harm than good because it engenders feelings of inadequacy or fear of criticism and it is ultimately an important cultural barrier to incident reporting of errors. Culture of blame also causes criticism of the person who makes the error with a direct consequence of loss of professional reputation. For safety improvement and error management, it is necessary to interrupt the blame cycle and promote a reporting and learning culture.	Blame is a deep-seated culture in medicine and nurses due to perception of human infallibility. Good analytical measure and reported statistical outcomes from surveys.	none noted	Good description of blame and punishment as fears of medical and nursing staff. Italy. Incorporate into management's handling of nurses experiencing medication error.

The second victims of adverse health care events, Nursing Clinics of North America, 47(3), 383-393.	Hall, L., & Scott, S. (2012).	CINAHL with Full Text; Nurses, errors, second victims	Editorial	Level VII	Discuss the issue of nurses at risk of traumatization from situations that cause harm not healing to patients and recommendations for how health systems can help nurses at risk of harm from such events.	n/a

Integrative Review	n/a	Nurses able to move on after involvement in an error event derive meaning and personal learning that they are able to employ in the future and serves as a positive coping strategy. Conversely, blame-oriented environments make health care workers more likely to turn to denial, distancing, and discounting the impact of the error as negative coping mechanisms. Active listening and peer conversations are listed among preferred support mechanisms.	Good summarization/literature review of existing evidence on the second victim phenomenon. Further discusses nursing education, students, and implications for nursing research and policy.	none noted	Summarization with good implications/recommendations sections for future studies. USA. Incorporate study data into background assessment/population/literature review.

When the 5 rights go wrong: Medication errors from the nursing perspective. Journal of Nursing Care Quality, 25(3), 240-247.	Jones, J. ,& Treiber, L. (2010)	CINAHL with Full Text; Nurses, medication errors, perception, attitudes	Descriptive survey	Level VI	To describe nurses' perceptions about how and why medication errors occur and their personal experiences with medication errors.	Random sample of active Registered Nurses, roster obtained from Georgia Board of Nursing, 2472 surveys mailed, 202 responses total (8.2%), 158 (78%) reported experience with medication errors.

Descriptive questionnaire asking a series of open-ended survey questions about the error(s) requesting a description of incident, factors contributed to making the error, and associated feelings. Via paper or online. Qualitative responses analyzed with Benner's interpretive model, key themes were identified, reviewed, and classified.	Participants identified factors contributing to medication error include physical exhaustion, interruptions and distractions, being new/lack of experience or training, pace/staffing. Participants stated medication error occurrence led to feelings of violation of trust, fears of patient harm, culpability, shame, self-blame, loss of professional image and self-esteem.	This study describes personal experiences of nurses who have made medication errors and related feelings. This study identified nurse-reported factors to commission of medication error to assist in understanding feelings associated with the error. Qualitative responses analysis showed that nurses retain strong emotional responses to medication error events - some nurses admitted that making an error cause them to want to stop practicing nursing.	Limitations include small response rate, but represents a random sample selection representative of national nursing population in demographic dispersion. Possible reduced response rate due to sensitive nature of questions and not knowing what researchers intended to do with the information.	none noted	Good frontline nursing specific descriptive information on perceptions of medication errors. USA. Incorporate study data into background assessment/population/literature review.

When nurses become the "second" victim. Nursing Forum, 47(4), 286-291.	Jones, J., & Treiber, L. (2012)	CINAHL with Full Text; Nurses, medication errors, second victim	Concept analysis	Level V	A discussion on the concept of "second victim" within the context of medication administration errors and factors that contribute to nurses becoming second victims after making an error.	Nurses

Integrative Review	n/a	The phenomenon of victimization affects all nurses and has enormous implications for nursing practice and the nursing profession. Most mistakes occur due to systemic issues, and the culture of individual blame most be eradicated. Nurse who make mistakes need support from their nursing peers, fellow healthcare professionals, and institutions in which they work.	There is little understanding of the distress process for second victims. Few studies document the ways in which being a second victim shapes a nurse's career trajectory. Further study is needed to more fully understand the meaning of the medication error experience and to find ways to ameliorate potential harm.	none noted	Good summarization/review of the second victim phenomenon, consequences, and medication administration errors. USA. Incorporate study data into background assessment/population/literature review.

Changes in nursing practice: Associations with responses to and coping with errors, Journal of Clinical Nursing, 20(21/22), 3246-3255.	Karga, M., Kiekkas, P., Aretha, D., & Lemonidou, C. (2011).	CINAHL with Full Text; Nurses, errors, coping, distress, attitudes	Prospective, correlational	Level VI	To investigate emotional responses of nurses to errors, error-coping strategies used, perceptions of senior staff response, and how these are associated with constructive or defensive changes in nursing practice.	5 public hospitals in SW Greece in 2007. A purposive sample of nursing personnel representing various depts/units. RN/LPNs with clinical tasks were surveyed.989 surveys distributed, 561 returned (56.7% response rate). 536 indicated experience with error.

Descriptive survey in which participants were asked to describe the most serious error they felt personally responsible in their career, about its adverse (or potentially adverse) patient results, perceived causes, and error severity. Then the participants were asked to report their emotional responses, perceived senior staff responses, error-coping strategies used, and changes in their	Emotional responses: 67% felt depressed, 52.4% felt angry at self, 44% felt guilty, 21.5% felt professionally inadequate, 34.3% felt embarrassed, 36% felt fearful of patient's clinical course, 13.8% felt fearful of repercussions, 21.6% felt fearful of losing colleague's trust. Error-coping strategies most used were accepting responsibility and seeking social support.	Positive senior staff responses and appropriate supportive measures will allow nursing staff to properly cope with their initial negative emotional responses, and manage them in an adaptive way to that they can learn from their errors and prevent their recurrence. Providing support to staff after errors should be systematic, based on the activation of institutional mechanisms. Appropriate counseling could help nurses interpret their feelings of distress, thus overcoming sense of	Possibly limited by missing data, but larger investigation than previous studies of its kind. Study conducted in Greek hospitals only.	none noted	Good statistical data on emotional responses of nurses to medication errors. Greece. Incorporate study data into background assessment/population/literature review.

Moral distress, compassion fatigue, and perceptions about medication errors in certified critical care nurses. Dimensions of Critical Care Nursing, 30(6), 339-345.	Maiden, J., Georges, J., & Connelly, C. (2011).	Academic Search Premier; Nurses, medication errors, attitudes, distress	Descriptive correlational	Level VI	To examine previously untested relationships between moral distress, compassion fatigue, perceptions about medication errors, and nurse characteristics.	Out of 1000 total mailed surveys, a purposive sample of 205 critical care registered nurses who were members of Amer.Assoc. Critical-Care Nurses and involved in patient care delivery within prior 12 months returned quantitative mailed surveys. Small 5 RN subgroup selected for qualitative focus group.

practice in response to the reported error. Missing data dealt with by mean substitution method.		incompetence, and fear of humiliation or repercussions.			
Quantitative survey comprised demographics to document nurse characteristics, a Moral Distress Scale, the Professional Quality of Life Scale, and the Medication Administration Error Survey.	Medication packaging as a perceived reason for medication error occurrence was positively correlated with years in practice. Moral distress, compassion fatigue, intent to resign, and the perception of inadequate nurse staffing as the reason for medication errors were positively correlated. In Qualitative subgroup, participants related negative	The current work settings of CCRNs provide settings that isolate and often leave the nurse feeling inadequate or morally bad as the result of medication error. Findings support building a transformed work culture in which error reporting is actually commended, instead of punished.	Conducted in critical care nurses, possibly translatable to other intense work environment. Demographics did not include geographic information to know if this was a well-distributed survey.	none noted	Brings into discussion topics of moral distress, compassion fatigue in critical care nurses and relates them to causes for medication error. USA. Incorporate study data into background assessment/population/literature review.

Nurse perceptions of medication errors: What we need to know for patient safety. Journal of Nursing Care Quality, 19(3), 209-217.	Mayo, A., & Duncan, D. (2004)	CINAHL with Full Text; Nurses, medication errors, perception	Descriptive correlational	Level VI	To examine the perceptions of medication errors: what nurses believe constitutes a medication error, what is reportable, and what barrier to reporting exist.	United Nurses Association of California/Union of Health Care Professionals practicing in 16 Southern CA acute care hospitals (9000 nurses), 5000 randomly selected with final sample goal 1000 RNs. 983 responses = 20% return rate.

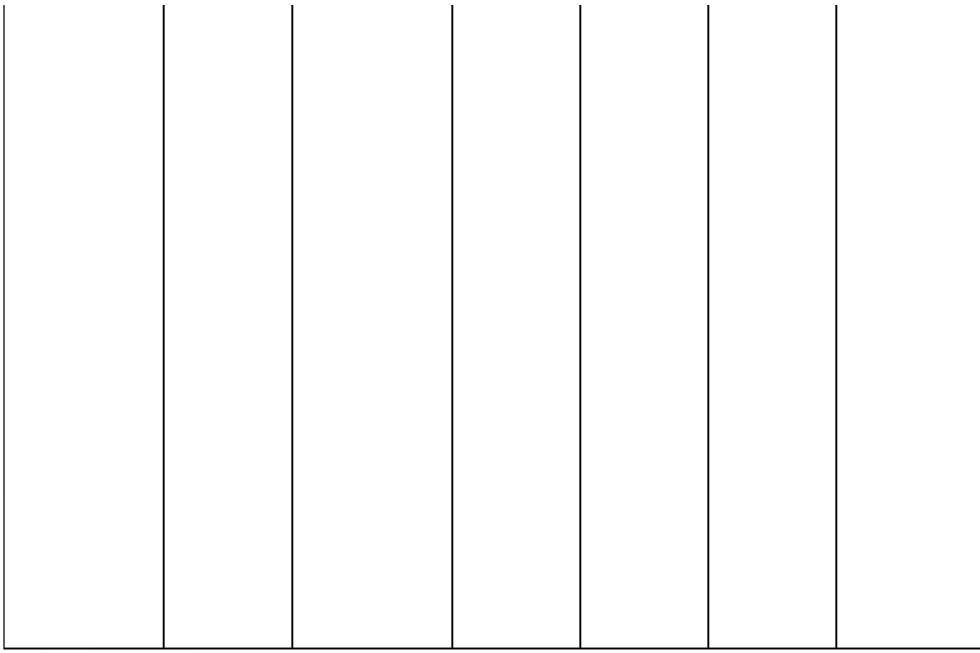
	emotions associated with medication error: devastation, fear, and feeling so badly they considered leaving nursing.				
Self-reported survey using the Modified Gladstone instrument which measured nurse perceived causes of med errors, % of drug errors reported to nurse managers, types of incidents (scenario provided) classified as (a)medication errors, (b) reportable	Top 3 causes of medication error = MD handwriting, nurse distracted, nurses tired or exhausted. Participants indicated that mean % 45.6 of all medication errors are reported to the nurse managers. Reasons for not reporting include: fear of manager reaction (76.9%), fear of coworkers' reactions (61.4%), and not thinking the error was	No single or combination of nurse demographics strongly associate with nurse perception on medication errors. Nurses need clarification of what constitutes a medication error and organizations need clear guidelines to decipher what constitutes med error.	Large sample, representing all shifts in acute care hospitals. Sample drawn from healthcare union, so may not be generalizable to non-unionized RNs. Scenarios for medication error reporting were brief, without much detail, which may change participant perception of necessary actions.	none noted	Starts with good literature review of medication errors and effects on nurses, but strongly focused on reporting and causes. USA. Incorporate study data into background assessment/population/literature review.

Learning from errors in nursing practice. Journal of Advanced Nursing, 26(1), 111-119.	Meurier, C., Vincent, C., & Parmar, D. (1997)	CINAHL with Full Text; Nurses, error, coping	Descriptive survey	Level VI	Aimed to address the causes of nursing errors, how nurses respond to their errors, and what factors predict whether nurses learn from their errors or not.	175 nurses, 75 from ward areas and 100 from nurses attending an 'examining and assessing course' in a district general hospital in the UK. 145 (83%) responded, 16 discarded when nurses didn't complete paragraph describing an error = 174 (74%) valid for analysis.

to physicians, or (c) reportable w incident report, and nurse view on reporting medication errors.	serious enough (52.9%). 80.4% of nurses did not fear disciplinary action (job loss) d/t error commission.				
22-item questionnaire modified from version by Wu et al. (1991), replacing medical items with nursing items. Participants first wrote about an error (drug errors excluded), then described their emotional responses to the error, the coping mechanism they used, whether they	64% nurses reported that their errors has some consequence for the patients. 79% reported stressful work environment as important element in cause of error. 73% of nurses felt angry at themselves, 46% felt inadequate, 37% fearful of repercussions, 66% guilty feelings. Majority felt need to discuss their errors with other, preferring colleagues	Causes of errors are multifactorial, and the perception of causes along with circumstances in which they occurred were assoc with changes in practice. When senior staff nurses were seen to be insensitive/unsupportive, and unsafe practices went unchallenged, nurses would be inclined not to report their error. In most cases, the nurse became emotionally	Relatively small sample of nurses. Conducted in one hospital in the UK. Good statistical data and analysis.	none noted	Purposively excluded medication errors. Discussed nursing errors. UK. Incorporate study data into background assessment/population/literature review.

Nurses' responses to severity dependent errors: A study of the causal attributions made by nurses following an error. Journal of Advanced Nursing, 27(2), 349-354.	Meurier, C., Vincent, C., & Parmar, D. (1998)	CINAHL with Full Text; Nurses, errors, attitudes	Descriptive survey	Level VI	To investigate the types of attributions nurses make following an error; and to examine the types of causal factors that are associated with taking responsibility for an error.	60 nurses attending the 'examining and assess' course in the UK. Split into two groups of 30.

discussed the error with others, the response of senior staff to the error, and changes in practice resulting from the error.	(66%), spouse/significant other (24%). 68% reported accepting responsibility as coping mechanism. Negative coping strategies also cited: 16% distancing, 19% refuse to talk about it.	distressed and had internal or external emotional responses.			
Sample split into two subgroups and each given a separate questionnaire: one with a scenario with serious outcome, the other with a scenario with a non-serious outcome. Nurses asked to state what they believed to	80% of nurses responding to the scenario with the serious outcome and 63% in the scenario with the non-serious outcome would have blamed themselves if they had made the error. Both groups of nurses judged the cause of the error to be internal, unstable, and uncontrollable.	Making internal causal attributions following an error has previously shown link with nurses being able to cope better, accept responsibility, and make changes in their practice. Yet, this can also lead to ignoring or discounting the role of other factors into cause of error. Tendency for nurses to attribute less	Small sample of nurses in UK, not easily generalizable, not known what types of work environment the nurses work in.	none noted	Did not discuss medication error. Looks more at causality/attribution theory. UK. Incorporate study data into background assessment/population/literature review.



be cause of specific situation error, and then code causes and internal or external whether they blamed themselves or others. Cause then evaluated with Russell (1982) causal dimensions scale.		importance to an error with a less serious outcome. Nurses and supervisors must be aware of influence of outcome knowledge on the evaluation of errors in that those errors causing harm are judged more critically than without harm results.			

Nurses' perceptions: When is it a medication error?. Journal of Nursing Administration, 29(4), 33-38.	Osborne, J., Blais, K., & Hayes, J. (1999)	CINAHL with Full Text; Nurses, medication error, perception, attitudes	Descriptive comparative	Level VI	To investigate nurses' perceptions of medication errors and appropriate reporting.	92 surveys distributed to part-time and full-time RNs on medical-surgical units in a Southern FL hospital. 57 completed surveys returned (61.9% response rate). 51.8% participants represented day shift, 48.2% represented night shift..

Survey asked participants ' perceptions of main causes of medication errors, what constitutes a medication error (5 scenarios presented), and medication error reporting. Tests of significance conducted to detect differences in perceptions related to age, years in practice, and education (no significant difference detected).	Major causes of medication errors include failure to check nameband of patient with medication record, fatigue and exhaustion, and distraction. Participants perceived that other nurses did not report medication errors because of fear of reaction from the nurse manager and coworkers; but they were not afraid of losing their jobs.	This study highlights the need to clarify existing policies, especially in what constitutes a medication error and when it should be reported. Possibly changing the term from medication error to adverse drug event can increase reporting. Tailor incident reporting system to focus on incident for analysis as opposed to punitive actions toward the health care provider who commits the error.	Small convenience sample from one community hospital. Nurses only included medical-surgical adult unit settings.	none noted	Early study on medication error incidents which later studies reference. USA. Incorporate study data into background assessment/population/literature review.

Caring for the caregiver: Moving beyond the finger pointing after an adverse event. Journal of Emergency Nursing, 37(3), 263-265.	Paparella, S. (2011)	CINAHL with Full Text; Nurses, adverse event	Editorial	Level VII	To discuss errors in health care and nurse's response to adverse events.	n/a

	Integrative Review	n/a	Responses of persons involved in harmful errors and adverse drug events are more personal: shock, anger, denial; go through stages of bargaining, guilt, and regret of their actions; fear loss of reputation, licensure, job, and criminalization of the event. Need to move beyond historical Name, Blame, Shame model of dealing with errors and instead staff must learn the best way to support providers who feel victimized by the error.	n/a	none noted	References MITSS system as resource. USA. Use in planning intervention to address impact of medication errors on nursing staff.

How to develop a second victim support program: A toolkit for health care organizations. Joint Commission Journal on Quality and Patient Safety, 38(5), 235-240.	Pratt, S., Kenney, L., Scott, S., & Wu, W. (2012).	MEDLINE; Second victim, nurses, error	Editorial	Level VII	Provide health care leaders with tools and resources for developing and implementing a second victim support system.	A consensus-based, iterative process was employed in which recognized experts in patient safety and emotional support were recruited to develop a toolkit for establishing an institutional emotional support process for clinicians.

Integrative Review	n/a	Health care organizations do not routinely offer emotional support because their leaders do not know how to develop and successfully implement a support system. The developed toolkit is modular, specific, and referenced. Consists of 10 modules, each with a series of specific action steps, references, and exemplars. MITSS toolkit available for free download, can be adopted and adapted to specific institutions.	Effectiveness not yet proven.	none noted	Useful for intervention planning. USA. Use in planning intervention to address impact of medication errors on nursing staff.

Chronology of medication errors by nurses: Accumulation of stresses and PTSD symptoms. Issues in Mental Health Nursing, 26(8), 873-886.	Rassin, M., Kanti, T., & Silner, D. (2005).	Academic Search Premier; Nurses, medication errors	Qualitative	Level VI	To examine the influence of medication errors on the mental state of the erring caregiver.	Convenience sample of 20 nurses from a major medical center in Israel who, through reports through risk management dept, were responsible for the occurrence of a medication error for the first time in their professional career. 30 had been asked to participate, but 10 declined due to not wanting to talk about it again.

Semi-structured, in-depth interview. Questions directed participants to talk about the medication error event, events preceding the error, the emotions and thoughts experienced, and the consequences of the error on their own lives. Data analyzed using content analysis. Data organized chronologically into 3 parts: day event occurred, the first weeks that followed, and the	Events preceding errors were stress and task overload on the erring nurse, as well as distraction, inattention, and lack of concentration. Upon error recognition, all participants reported stress-related physical responses. Nurses employed quick coping by focusing on the problem and prevent imminent danger to patient. Later that day participants feared repercussions, displayed anger, guilt, shame, and loss of confidence. Even months later, the medication errors had	Findings suggest that an error has severe emotional effects: fear, guilt, shame, sometimes even mental pressure lasting for months, reminiscent of PTSD symptoms. It could be said that medication errors have a potential to become a trauma, leaving many traumatized workers. Findings correspond with previous studies that show the erring experience produces disappointment and guilt for hurting the patient. Authors suggest supporting the	Semi-structured methods allows flexibility in question form and order presentation to facilitate subjective responses. Small convenience sample, based in Israel.	none noted	Good qualitative study, good exemplars from participants. Israel. Incorporate study data into background assessment/population/literature review.

Feelings of nursing professionals after the occurrence of medication errors. Acta Paulista de Enfermagem, 20(4), 483-488.	Santos, J., Silva, A., Munari, D., & Miasso, A. (2007)	CINAHL with Full Text; Medication errors, nurses, coping	Descriptive and exploratory qualitative	Level VI	To understand the feelings of nursing professional who have committed medication errors, and hot to address the situation.	Nursing professionals working at the Intensive Therapy (clinical and surgical) Medical Clinic and Emergency Room at a hospital in Goiana, Brazil. 15 professionals participated in the study. Participants were not required to disclose the institution/time/ place in which the error occurred.

months that followed.	emotional affects. Continuous emotional distress is similar to that seen in Post Traumatic Stress Disorder (PTSD) symptoms.	erring workers through support group.			
Semi-structured interviews. Data analysis done through content analysis. Two categories of results: Category I = Feelings experienced after the error, Category II = Actions and strategies to face feelings caused by errors.	Feelings following an error include panic, despair, preoccupation, guilt, shame, fear, and insecurity. Actions following an error first included finding a way to face the unpleasant feelings by looking for help or sharing the problem with someone who could help him/her. Searching for help made some professionals formally communicate	Errors negatively affect nursing professionals with ethical and moral principles to do good and never harm the client. These episodes may cause psychological and emotional traumas and may be oppressive and harmful. Health professionals are not prepared to deals with errors and the resulting unpleasant feelings. Emotions may	Small convenience sample in a single hospital in Brazil. Good exemplars from interviews.	none noted	Good exemplars. Brazil. Incorporate study data into background assessment/population/literature review.

Nurses' experiences of drug administration errors. Journal of Advanced Nursing, 60(3), 317-324.	Schelbred, A., & Nord, R. (2007)	CINAHL with Full Text; Nurses, medication errors	Explorative, descriptive	Level VI	To describe the experiences of nurses who had committed serious medication errors, the meaning these experiences carry, and what kind of help and support they received after committing their error.	Nurses in Norway in 2003 who had experienced a medication error. Nurses were recruited through a national journal. 13 nurses responded, 10 of whom had committed medication errors that resulted, or potentially resulted, in patient harm. Other 3 excluded for not being able to define the severity of their error. 7

	the error, generating feelings of tranquility. Second actions included personal learning.	also trigger physical alterations, support is needed for professionals who are experiencing this to prevent future illness.			
In-depth interviews starting with the broad question "please tell me about your experience of making the medication error". The open-ended questions elicited the following themes: immediate reactions from nurses upon realizing error, emotional response to error,	Immediate reactions include: shock, dread, disbelief, panic. Emotional response: guilt, shame, devastated, thoughts of suicide, insomnia, nightmares, lack of self-confidence, struggle to accept their fallibility. Reaction from colleagues/management: met with silence (n=8), emotional support by comforting and sharing similar stories. Professional	It was clear that committing a medication error was traumatic for the participants and the, even years after, they still struggled to handle the stress caused by the error. The incident represented both a personal and professional threat and deeply affected their self-image, regardless of whether the patients were harmed or not. Recognition must be given	Small sample, Norway, self-selected through advertisement so could have used research as forum to unburden self. Come from different work environments, though it was not specified where they worked when the error happened. Time elapse since committing error anywhere from 1 to 10 years.	none noted	Brief exemplars given, good discussion on results from interviews. Norway. Incorporate study data into background assessment/population/literature review.

						worked in hospital, 2 in community, 1 in home health.

relations with patients and family after error, colleagues' and managements' reactions to the nurses after the error, type of help/support received after the error, nurses' candor about the error, how they coped with the incident, and what impact the error had on their nursing practice. Data analysis through thematic selection and phenomenological interpretati	help organized by management (n=1), help from colleagues (n=1), all nurses wanted help and all felt they would have benefited from personal and individual attention. Coping: got better with time, talk with someone, returning to work, reduce workload/change workplace (n=2), professional psychologist (n=2). Impact: Increased their understanding and tolerance, improved their drug administration routines, devastation to personal and professional life and left nursing (n=1).	to the effects upon the nurses who make such errors and the support and help they need to deal with the incident acknowledged.			

The natural history of recovery for the healthcare provider "second victim" after adverse patient events. Quality and Safety in Health Care, 18(5), 325-330.	Scott, S., Hirschinger, L., Cox, K., McCoig, M., Brandt, J., Hall, L. (2009)	CINAHL with Full Text; Error, adverse events, second victim	Qualitative exploratory	Level VI	To describe the experiences and recovery trajectory of past second victims.	Univ. of Missouri Health Care (UMHC) sought professionals involved with patient safety event investigations btwn 2003-2007. Goal was minimum 30 multidisciplinary professionals, contacted 43, 38 agreed to participate, 31 completed (72% return rate). Time since adverse event was 3 weeks to 44 months (mean 14 months). Study conducted 2007-2008.

on.					
25 semi-structured interview guide was developed, including demographics, participant recount of adverse event circumstances, physical/psychosocial symptoms experienced, and recommendations for improving post-event support. 4-person interview team consisted of 2 safety/risk management experts, one certified holistic nurse, and one sociologist. Data	Life-altering experience that left a permanent imprint on the individual. Factors that intensified experience included relationship btwn pt and caregiver, past clinical experiences, or other perceived 'connection'. Participants relived event with certain triggers. Researchers identified 6 stages of recovery: 1)chaos and accident response 2)intrusive reflections 3)restoring personal integrity 4)enduring the inquisition 5)obtaining emotional first aid 6)moving	Regardless of sex, professional background, or years experience, all participants easily recalled the immediate and ongoing impact of their specific career jolting event. Developed a largely predictable recovery trajectory identified as the 6 stages of recovery. Based on participant responses, frontline supervisors and peers could be trained to provide immediate and targeted support especially during the early stages. For later stages, institutions	Small purposive sample, one hospital, multi-disciplinary (11 nurses, 10 MDs, 10 other).	unfunded	Not specific to medication errors. Interview guide included with article. This work is well-referenced by other later works, and references prior works herein cited. Great tabular reporting of physical and psychosocial symptoms with frequencies. USA. Incorporate study data into background assessment/population/literature review.

Caring for our own: Deploying a systemwide second victim rapid response team. Joint Commission Journal on Quality and Patient Safety, 36(5), 233-240.	Scott, S., Hirschinger, L., Cox, K., McCoig, M., Hahn-Cover, K., Epperly, K., Phillips, E., & Hall, L. (2010).	MEDLINE; Nurses, adverse events, second victim	Descriptive	Level VI	To estimate the size, scope, and requirements to deploy an effective and comprehensive support network.	Feb. 2009, a survey was sent to 5299 faculty and staff in the 6 facilities of UMHC through internal listservs, newsletters, and a mailing to the chief of staff. 898 returned = 17% response rate, 34% of whom were 3rd/4th yr med students and 23% physicians and 25% professional nurses.

analysis by themes further categorized by characteristics and stages.	on	should use resources currently trained to provide emotional support for other critical incident situations.			
10-item web-based survey designed to quantify the frequency and nature of the second victim experience, and to solicit desired characteristics of an effective institutional support response. Data analysis through simple counts and proportions for demographic items and	30% (269/898) reported experiencing personal problems within the past 12 months, such as anxiety, depression, or concerns about their ability to perform their jobs, as a result of a clinical patient safety event. 15% (40/269) reported contemplating leaving their profession, 65% (175/269) reported working out the issue(s) on their own. When support was offered,	The most frequently cited characteristic of an effective supportive program was to implement an institutionally sanctioned respite away from the care environment immediately after an even to allow the second victim to compose him/herself before resuming patient care. Respondents preferred formal support that was provided by the institution, optimally at the	Large sample population, low response rate. Multiple facilities located in one hospital system (one culture). Multidisciplinary.	none noted	Not specific to medication errors. Specific data outputs presented in article. Great model for the capstone project intervention! USA. Use in planning intervention to address impact of medication errors on nursing staff.

Consequences of fatal medication errors for health care providers: A secondary analysis study. MEDSURG Nursing, 10(4), 193-201.	Serembus, J., Wolf, Z., & Youngblood, N. (2001).	CINAHL with Full Text; Medication error, nurses, coping	Secondary analysis	Level VI	Use a case study design to describe the latent and manifest meanings in the survey accounts of 11 health care providers who made fatal medication errors.	11 cases/respondents in which patient death occurred selected from a systematic random sample of health care professionals (n=402) of nurses (n=208) pharmacists (n=112) and physicians (n=82) obtained from target

categorical variables and iterative review for narrative responses on desired support strategies.	35% received it from colleagues and peers, 29% received it from supervisory personnel.	department/unit level. Authors developed an on-demand emotional-support RRS for their second victims using internal resources and a model of support (Scott Three-Tiered Interventional Model of Second Victim Support).			
Using cases from the primary study, descriptive statistics were reviewed for themes from close-ended items. Themes were sought from the open-ended questions.	Mean years elapsed since incident = 22.7 (range 2-50). Highest ranked responses after making medication error resulting in pt death include wishing to make amends, immobilized, nervous, fearful, insomnia, denial, cried, lost confidence in ability to perform job, humiliated,	Essential themes elicited: being responsible for a patient's death, noting failure, fearing punishment, hoping to correct the wrong, denying personal culpability, feeling guilty and depressed about the death, discerning public humiliation, needing	Study findings cannot be generalized to the target population, rather they may serve to sensitize others to the consequences of fatal errors for health care providers. Very small sample for secondary analysis, localized to those who had patient	none noted	Multidisciplinary. Good description of each of the 11 cases analyzed (in a table). Early work on which others are based. USA. Incorporate study data into background assessment/population/literature review.

						population acquired from the State Boards of Medicine, Nursing, and Pharmacy in PA. Ultimate response rate of original sample is 6.36%. The 11 cases were pulled from this final population.	

	embarrassed, worried, and guilty. Highest-ranked concerns: fear for the patient, fear of license suspension, judged as incompetent by co-workers, loss of respect by co-workers, fear of rejection, held responsibly by other, and fear of disciplinary action. 2 respondents were fired, 8 experienced legal action, 1 was found guilty of criminal prosecution, and 2 others were sued. Damages were awarded in one situation.	support, coping with the error, and being fatalistic and feeling threatened about the likelihood of future errors.	death occur as a result of their medication error. Multidisciplinary.			

Don't abandon the "second victims" of medical errors. Nursing2012, 42(2), 54-58.	Smetzer, J. (2012)	CINAHL with Full Text; Nurses, second victim, errors	Editorial	Level VII	Discuss the concept of second victims, just culture, and tools for institution al change to support the second victims.	n/a

Integrative Review	n/a	Support initiatives for second victims need to be established and widely communicated so that staff are aware of available resources, are receptive to accepting help, and know how to access assistance. These include: treatment that is just, respect, understanding and compassion, supportive care, transparency and opportunity to contribute to learning. Tools for institutional change include MITSS toolkit, Institute for Safe Medication Practice (ISMP) referral, Institute for	n/a	none noted; author is VP of ISMP.	Good review of existing research. USA. Use in planning intervention to address impact of medication errors on nursing staff.

Devastatingly human: An analysis of registered nurses' medication error accounts. Qualitative Health Research, 20(10), 1327-1342.	Treiber, L., & Jones, J. (2010).	CINAHL with Full Text; Nurses, medication errors	Qualitative, exploratory	Level VI	To investigate the perceived causes for medication administration errors, and to better understand how nurses deal with them.	Random sample of registered nurses in GA. Response rate 8.2%, 158 of 202 returned surveys (78%) included medication error descriptions.

		Healthcare Improvement (IHI) white paper on "Respectful Management of Serious Clinical Adverse Events", and the Scott second victim rapid response team.			
Open-ended survey method, respondents able to complete online or by paper. Interpretive analysis using Benner's model.	Analysis revealed 6 key symbolic themes: 1)I'm to blame, but… 2)Being new 3)Devastating reactions 4)Dealing with fear 5) Frustrations with technology and regulations 6)Lessons learned.	The errors recounted were devastating for nurses' professional identifies and created long-lasting emotional memories. Nurses often wrote about dealing with fear. Several wrote about covering or not reporting errors as ways to manage fear. Blame diffusion must take place to survive making an error.	Low return rate, but the nature of the survey was to have nurses report their errors that could be perceived as negligent, illegal, criminal, or otherwise troubling. Not known total sample size chosen from GA nursing database. Subjectively designed responses. Difficult to remove researcher	Faculty Incentive Funding Award for Scholarship: Kennesaw State University.	Good exemplars, good categorization of themes. USA. Incorporate study data into background assessment/ population/ literature review.

Supporting staff after serious incidents. Clinical Risk, 12(6), 229-236.	Vincent, C. (2006).	CINAHL with Full Text; Errors, second victim	Editorial	Level VII	To discuss errors in health care, reactions and attitudes to errors, the impact of error and litigation, and strategies for coping with errors.	n/a

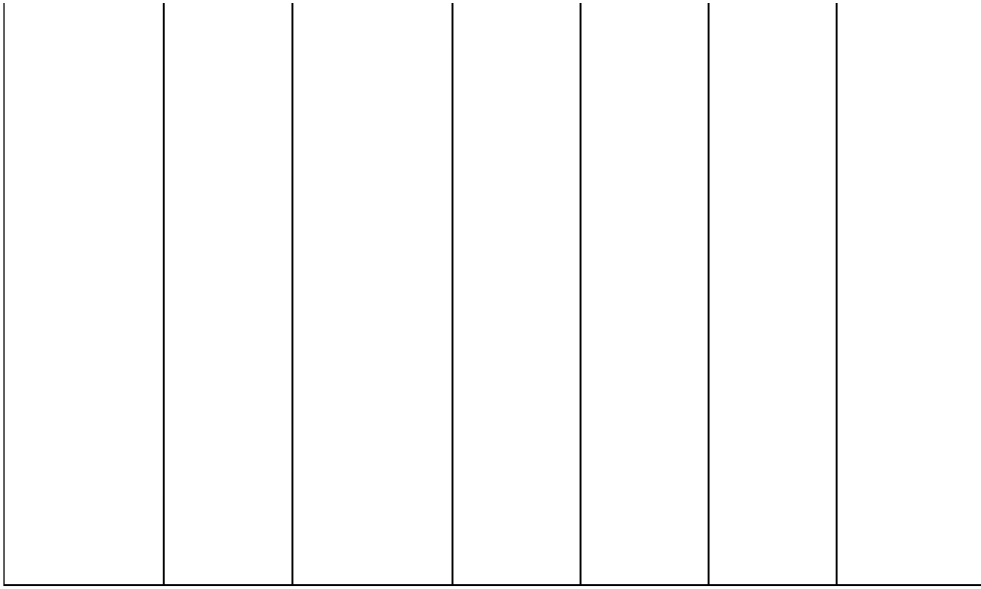
				subjectiveness in analyzing respondent subjective responses (free text).		
	Integrative Review	n/a	Understanding that mistakes will always occur, that reacting to them is ordinary, and in fact necessary for learning, is a first step in dealing with errors. Being understanding of others is a vital step towards a more open and safer culture. Many initiative aimed at assisting patients can be used for staff. Suggestions include: acknowledge the potential for error, disclosure to injured patients,	n/a	none noted	Limited to physicians/ medical errors. UK. Use in planning intervention to address impact of medication errors on nursing staff.

Supporting health care workers after medical error: Considerations for health care leaders. Journal of Clinical Outcomes Management, 15(5), 240-247.	White, A., Waterman, A., McCotter, P., Boyle, D. ,& Gallagher, T. (2008).	CINAHL with Full Text; Nurses, errors, perceptions	Literature Review	Level V	To describe how errors personally affect medical professionals, barrier to the implementation of provider support programs, and key issues for hospital leaders to consider when creating a support program.	n/a

		education about medical law and litigation, formal support and access to confidential counseling, communication skills training.			
Integrative Review	n/a	Health care workers involved in medical errors experience significant emotional turmoil. Nurses and physicians report feeling anxious, guilty, depressed, and fearful after an error. Job satisfaction and performance may decline. Providers are often reluctant to discuss these emotions with colleagues and may not seek support from others as they cope with	n/a	Agency for Healthcare Research and Quality and the Greenwall Foundation Faculty Scholars Program.	Geared towards physicians and medical errors (not medication), though does discuss nurses. Good literature review. USA. Use in planning intervention to address impact of medication errors on nursing staff.

Nurses' perceptions of harmful outcomes from medication errors. MEDSURG Nursing, 4(6), 460-467, 471.	Wolf, Z., Haakenson, D., Jablonski, R., & McGoldrick, T. (1995).	CINAHL with Full Text; Nurses, medication errors, perceptions	Descriptive qualitative	Level VI	To determine if factors associated with medication errors explained perceived harmful outcomes from such errors using the Medication Error Risk Profile (MERP).	Convenience sample: 1650 instruments distributed by hospital mail to all employed RNs and LPNs in 3 acute care hospitals, 218 questionnaires returned, only 206 complete and indicating experience with medication error (12.9% response rate).

		these emotions. Leaders at medical centers should consider providing counseling services and other means of support to health care providers involved in medical errors.			
Survey instrument: Part i contained questions on the type of medication and the physical location/time of incident, and the 4-point MERP scale indicating level of harm from the error. Part II requested the participants	82.5% of nurse respondents indicated that they were at fault for the error (n=170). Respondents notified nurse managers most frequently with resident physicians next most often. Nurses indicated that the most common intervention needed after the error was committed was extra nursing time spent monitoring the	The harmful outcomes consequent to medication errors can be minimized if systems of prevention, including risk reduction programs, are present yearly in hospitals and other agencies. Nurses should be aware of high-risk situations, and identify that perceived harmful outcomes immediately following a	Data was collected retrospectively, with nurses reporting an error that they recalled vividly. One area not included in this study was the staff mix on units where the medication errors occurred. Low response rate.	none noted	Early work on medication errors and factors. Based on pilot study in column #35.USA. Incorporate study data into background assessment/population/literature review.



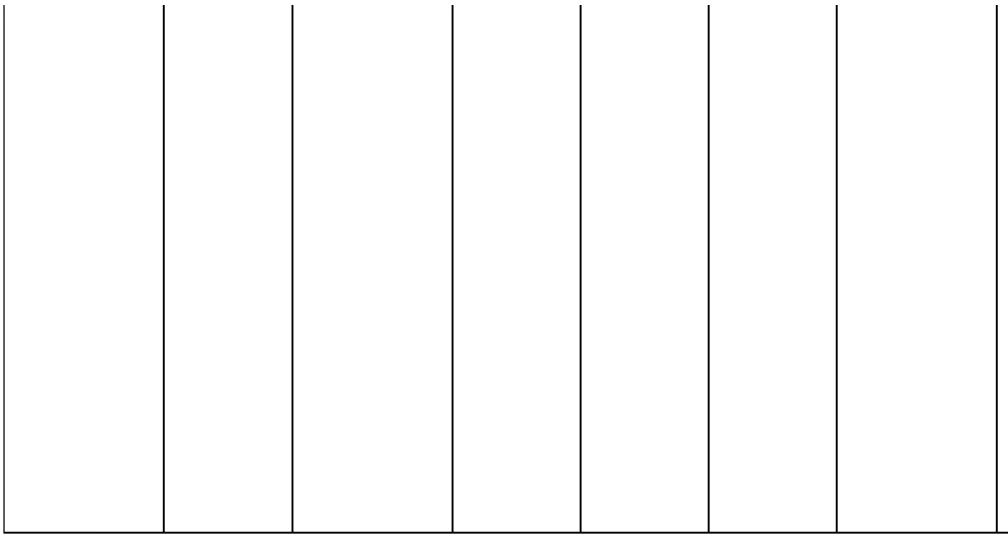
	to classify the error as commissio n or omission. Part III looked for factors contributing to the error occurrence. Part IV asked participants to describe actions following error discovery.	patient.	medication error.			

Factors associated with a perceived harmful outcome from medication errors: A pilot study. The Journal of Continuing Education in Nursing, 27(2), 65-74.	Wolf, Z., McGoldrick, T., Flynn, E., & Warwick, F. (1996).	CINAHL with Full Text; Nurses, medication errors	Descriptive qualitative	Level VI	A pilot study to 1) describe factors associated with a perceived harmful outcome following medication errors made by nurses 2) to refine the Medication Error Risk Profile (MERP).	Convenience sample of RNs and LPNs currently employed in health care agencies, names obtained through employee lists from hospitals and from an enrollment list from a university school of nursing with RN-BSN and MSN programs. 676 questionnaires mailed, 117 returned, 94 complete = 17.3% response rate.

Multiple stepwise regression analyses were used to explain the variance in the dependent variable of perceived patient harm with: 1) phases of preparation and administration 2) categories of person responsible for the error 3) interventions needed following the error and symptoms related to the error.	91 (97%) respondents reported that nurses were solely responsible for committing medication errors. The most common time of day errors happened was 10pm with the error discovery at 2am. Medication errors were made on the average 110 months after graduation from nursing programs.	Medication errors are mistakes made by working nurses. However, many individuals are responsible for medication administration. Rather than blaming specific health care personnel, it is better for staff development instructors to examine systems of medication delivery.	Decent response rate, does not indicate when error occurred prior to survey.	none noted	Early work on medication errors and factors. USA. Incorporate study data into background assessment/population/literature review.

Medication errors: Ending the blame-game. Nursing Management, 35(8), 41-48.	Wolf, Z., & Serembus, J. (2004).	CINAHL with Full Text; Nurses, medication errors	Secondary analysis	Level VI	To discover the reactions of managers and other personnel directly involved with error reporting and to uncover the experiences of personnel who have made the mistakes.	Complete list of professional nurses (N=161387), MDs (N=30111) and pharmacists (N=12582) provided by State Boards for each discipline in PA. Respondents (N=402) included nurses (n=208), pharmacists (n=112), and physicians (n=82). Response rate 6.36%.

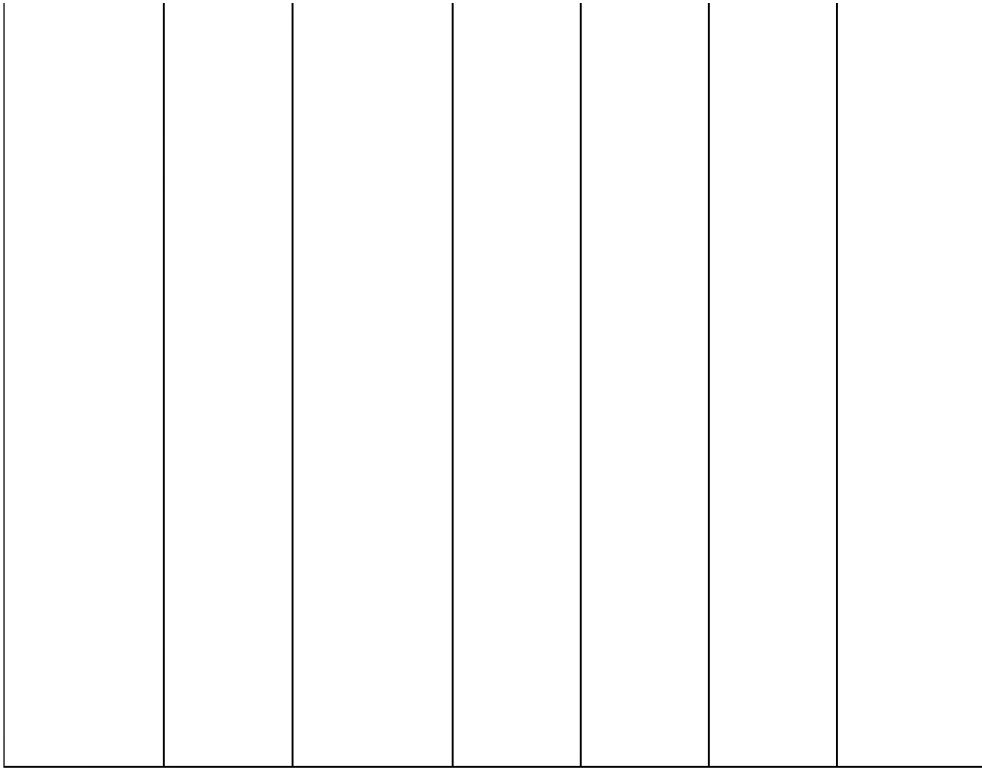
Self-report survey instrument examining serious medication error. Data analysis via statistical analysis on close-ended questions. Themes coded and clustered into patterns of supportive and nonsupportive actions from responses to open-ended questions from managers' and administrators' actions.	Highest recorded consequences from medication error included: name identified on an incident report, public or private reprimand, counseling and or referral for education, notation on personnel record. 50% of respondents reported no consequences involving administration and managers. In general, nonsupportive actions by managers toward nurses, pharmacists, and physicians were evidenced in the themes of demonstration disapproval, protecting self from implication, and blaming,	Results demonstrate that nurses, pharmacists, and physicians experience nonsupportive actions more than supportive actions following medication errors. Blame and reprimand prevail. Transforming blaming behaviors to those of support will most likely increase error reporting and systems improvement initiatives.	Multi-disciplinary, relatively small response rate, but decent sample sizes. Isolated managers' and administrators' responses from a larger prior survey.	none noted	Good statistical data on frequencies of negative outcomes associated with medication errors. USA. Incorporate study data into background assessment/population/literature review.



	humiliating, and disciplining. Supportive action identified included themes of voicing concerns, instructing and advising, empathizing, and notifying providers about the error.				

Responses and concerns of healthcare providers to medication errors. Clinical Nurse Specialist, 14(6), 278-290.	Wolf, Z., Serembus, J., Smetzer, J., Cohen, H., & Cohen, M. (2000).	CINAHL with Full Text; Nurses, medication errors	Descriptive, correlational	Level VI	Examine the responses and concerns of healthcare professionals about making medication errors and estimated patient harm from such errors.	Systematic random sample of nurses, pharmacists, and physicians obtained from State Boards for each discipline in PA. N=402 surveys returned from 9000 sent out total. Response Rate = 6.36%

Self-report survey using open-ended questions to elicit a description of the most serious drug errors made by the respondents, interventions performed as a result of the drug error, healthcare providers' responses and concerns about making the medication error. Data analysis through descriptive statistics and theme and meaning for subjective open-ended	Respondents indicated that more than 40% of errors took place on patient units. More than half of respondents reported that they feared patients were more seriously harmed than they actually were. Highest ranked responses overall of healthcare providers following error include feeling guilty, worried, nervous, and fear of punishment. Results also revealed that nurses, physicians, and pharmacists differed in regards to concerns. Nurses were more guilty, worried, and embarrassed than	Healthcare providers blame themselves for drug errors. The manner in which managers and administrators deal with errors affects whether caregivers feel safe in reporting them.	Multi-disciplinary, relatively small response rate.	none noted	Good descriptive statistics of feelings, concerns, and responses following medication error. Early work. USA. Incorporate study data into background assessment/population/literature review.



responses.	pharmacists and physicians. Nurses were also more fearful for patients, of disciplinary action, and punishment more.				

Medical error: The second victim, British Medical Journal, 320(7237), 726-727.	Wu, A. (2000)	Academic Search Premier; Error, second victim	Editorial	Level VII	Discuss medical errors and effects on physicians through introduction of term second victim.	n/a

Integrative Review	n/a	Patients are the first and obvious victims of medical mistakes, but doctors are wounded by the same errors: they are the second victims. The sympathy and support needed are rarely forthcoming. In the absence of mechanisms for coping and healing themselves, physicians find dysfunctional ways to protect themselves. In the long run some physicians are deeply wounded, lose their nerve, burnout, or seek solace in drugs or alcohol.	n/a	none noted	Seminal work introducing the term "second victim". Physician-specific. USA. Incorporate study data into background assessment/population/literature review.

Appendix B

Timeframe

	Task	Estimated start	Estimated length to completion	Sequential or parallel	Dependent on
A	Problem recognition and identification	August 2011	8 weeks	Sequential	None
B	Systematic Review of Evidence	August 2011	18 months	Parallel	None
C	Assess current organizational/department culture	January 2012	8 months	Parallel	None
D	Develop survey instrument	March 2012	2 months	Parallel	None
E	Validate survey content	May 2012	1 week	Sequential	Task D
F	IRB Approval	December 2012	4 months	Sequential	Task A, B, D, E
G	Recruit study participants	April 2013	3 weeks	Sequential	Task F
H	Distribute survey	May 2013	3 weeks	Sequential	Task G
I	Data Analysis	June 2013	4 weeks	Sequential	Task H
J	Create Recommendations	July 2013	2 weeks	Sequential	Task I
K	Disseminate Findings & Recommendations	August 2013	4 weeks	Sequential	Task J

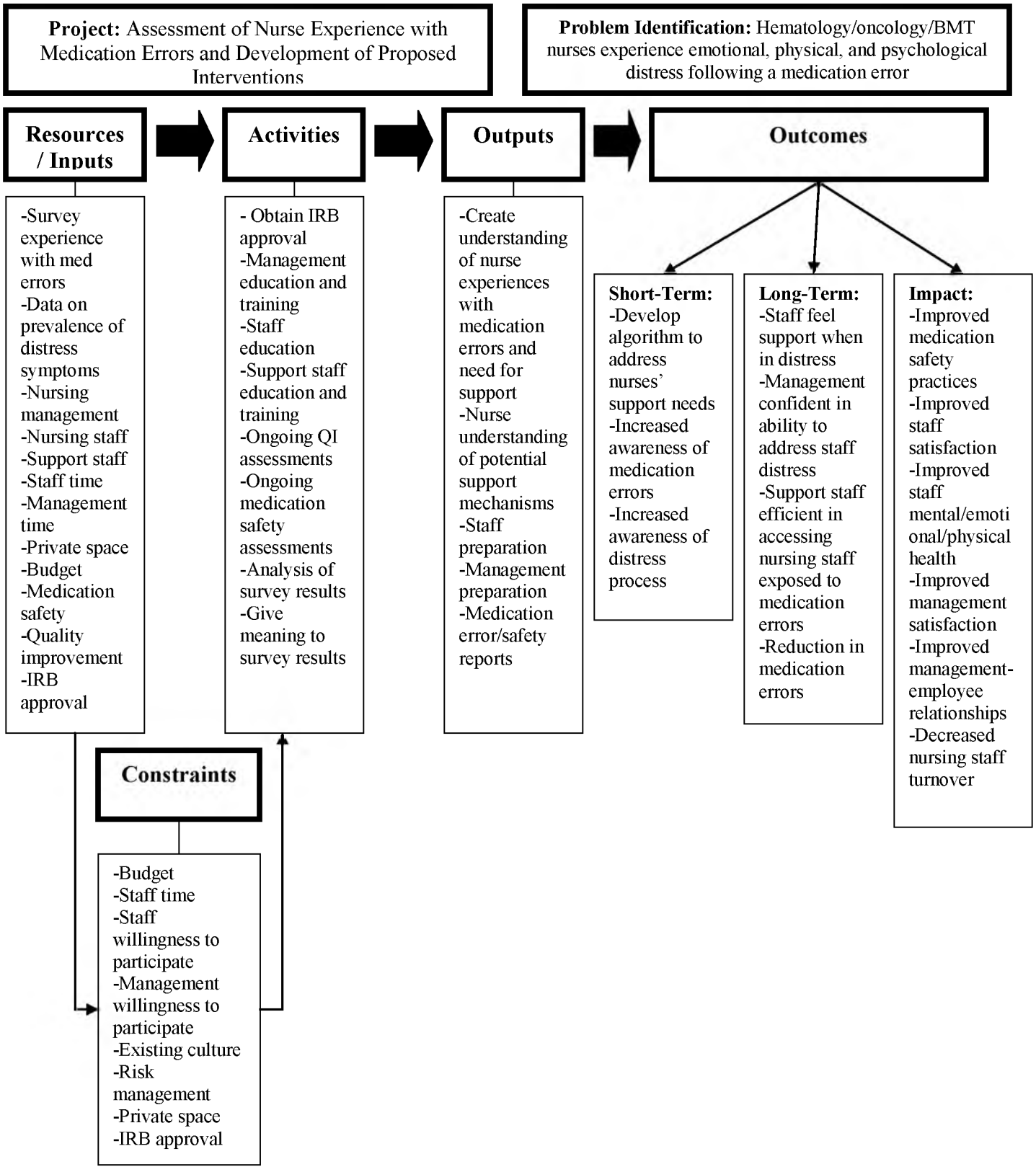
Appendix C

Budget and Resources

Project Resources	Cost	Total
Use of computers, printers, and copiers at project site	$150	$150
Survey copies	$0.05 per copy x 100 copies	$5
Supplies: Manila envelopes for survey return, copier toner, printer ink, paper, "Confidential" stamp for outside of envelope, labels for outside of envelope	$12 for a box of 100 envelopes $10 for pack of labels $6 for stamp $75 for toner, ink, paper	$103
Purchase of IBM SPSS Statistics software for data analysis	$50 for 6 month lease	$50
Consultation with statistician	$30/hour x 30 minutes	$15
Consultation with Safe Medication Practices Committee for survey content validity	$45/hour per person x 9 committee members, x1 hour total	$405
Recruitment of subjects (PI generating emails & attending staff meetings)	Maximum 3 emails: 5 minutes per email at $40/hr = $10 Attend 9 staff meetings to present study/recruit subjects: 15 minutes per staff meeting at $40/hour = $90	$100
Consultation with Clinical Mentor	20 one hour meetings at $50/hour = $1000 Meet in Clinical Mentor office at project site: $0	$1,000
Consultation with Capstone Chair	4 one hour meetings at $50/hour = $200 Meet by phone/in office at academic site: $0	$200
Travel costs to project site (Mileage rates)	$0.565/mile x 24 miles/way from PI home to project site x 50 trips	$1,356
Meet with unit managers/department director to present recommendations	1 one hour meeting at $55/hour per unit manager x 2 = $110 1 one hour meeting at $65/hour per department director x1 = $65 Meet in director office at project site: $0	$175
	Project Budget	**$3,559.00**

Appendix D

Logic Model



Appendix E

Survey Instrument

Medication Error Experience Survey

COMIRB Protocol # 13-1372

The purpose of this survey is to compile descriptive information on nurses' experience with medication error. Children's Hospital Colorado (CHCO) is committed to improving patient safety by minimizing preventable harm, and has implemented multiple measures to reduce medication errors throughout the organization. While CHCO continues making progress in preventing medication error incidence, the effects of medication error on nurses at CHCO is not well understood at this time.

Your participation in this survey is voluntary. This is an anonymous and confidential survey. Your answers will be maintained in a secure database and only used for the purpose of evaluating nurses' experience with medication error.

You will not be asked to provide any personal information. Your answers are non-punitive and cannot be linked back to you or a specific patient. It does not matter to this primary investigator whether you have reported your medication error experience in QSRS, nor will any details about the specific errors be asked of you.

If you have any questions before beginning this survey, or during the process, you may contact the Principal Investigator by email at Kristin.Belderson@childrenscolorado.org or by phone at (720)231-0994 (cell). Additionally, you may contact COMIRB at (303)724-1055 or by email at COMIRB@ucdenver.edu.

Please use the attached envelope to securely and privately return your completed survey to Kristin Belderson, MS, RN (Principal Investigator) at B495. I appreciate you taking the time to participate in this survey assessment.

Section I: Coping

The health care setting is a stressful work environment; coping is an important personal tool to assist with stress.

c1. In relation to your experience with medication error, regardless of whether the error has either occurred or resulted in patient harm, please tell me about how you would cope with this stress. Each item in the list asks something about a particular way of coping. Using a Likert scale of 1 to 4 *(1 = I would not do this at all, 4 = I would do this alot)*, please answer each item on the basis of whether it is something you would do, or have done in the past, to cope with medication error.

	Coping Item	*I would not do this at all*	*I would do this a little bit*	*I would do this a medium amount*	*I would do this a lot*
1	I would turn to work or other activities to take my mind off things.	1	2	3	4
2	I would concentrate my efforts on doing something about this situation.	1	2	3	4
3	I would say to myself "this isn't real".	1	2	3	4
4	I would use alcohol or other drugs to make myself feel better.	1	2	3	4
5	I would get emotional support from others.	1	2	3	4
6	I would give up trying to deal with it.	1	2	3	4
7	I would take action to try to make the situation better.	1	2	3	4
8	I would refuse to believe that it has happened.	1	2	3	4
9	I would say things to let my unpleasant feelings escape.	1	2	3	4
10	I would get help and advice from other people.	1	2	3	4
11	I would use alcohol or other drugs to help me get through it.	1	2	3	4
12	I would try to see it in a different light, to make it seem more positive.	1	2	3	4
13	I would criticize myself.	1	2	3	4
14	I would try to come up with a strategy about what to do.	1	2	3	4
15	I would get comfort and understanding from someone.	1	2	3	4
16	I would give up the attempt to cope.	1	2	3	4
17	I would look for something good in what is happening.	1	2	3	4
18	I would make jokes about it.	1	2	3	4
19	I would do something like shopping or sleeping to think about it less.	1	2	3	4
20	I would accept the reality of the fact that it has happened.	1	2	3	4
21	I would express my negative feelings.	1	2	3	4
22	I would try to find comfort in my religion or spiritual beliefs.	1	2	3	4
23	I would try to get advice or help from other people about what to do.	1	2	3	4
24	I would learn to live with it.	1	2	3	4
25	I would think hard about what steps to take.	1	2	3	4
26	I would blame myself for things that happened.	1	2	3	4
27	I would pray or meditate.	1	2	3	4
28	I would make fun of the situation.	1	2	3	4

Section II: Medication Errors

The National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) defines a medication error as:

"Any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labeling; packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use."

NCC MERP uses a system of nine categories (A through I) to further describe medication error and the associated degree of patient harm.

M1. Please tell me about your experience with each of the nine categories of medication errors listed below. For each category (A through I), please answer if you have experienced that particular category of medication error. Next, regardless of whether or not you have experienced the category of medication error, using a Likert scale of 1 to 10 *(1 = Never, 10 = Always)*, please rate the effect that each type of medication error has or would hold on your personal/professional self.

Category of Medication Error		Have you experienced this category of medication error?		How would you rate the effect of this category of medication error on your personal/professional self?											
Category	*Description*	*No*	*Yes*		Never										Always
A	Circumstances or events that have the capacity to cause error.	0	1	$Fear_a$	1	2	3	4	5	6	7	8	9	10
				$Shame_a$	1	2	3	4	5	6	7	8	9	10
				$Guilt_a$	1	2	3	4	5	6	7	8	9	10
B	An error occurred but the error did not reach the patient.	0	1	$Fear_b$	1	2	3	4	5	6	7	8	9	10
				$Shame_b$	1	2	3	4	5	6	7	8	9	10
				$Guilt_b$	1	2	3	4	5	6	7	8	9	10
C	An error occurred that reached the patient but did not cause patient harm.	0	1	$Fear_c$	1	2	3	4	5	6	7	8	9	10
				$Shame_c$	1	2	3	4	5	6	7	8	9	10
				$Guilt_c$	1	2	3	4	5	6	7	8	9	10
D	An error occurred that reached the patient and required monitoring to confirm that it resulted in no harm to the patient and/or required intervention to preclude harm.	0	1	$Fear_d$	1	2	3	4	5	6	7	8	9	10
				$Shame_d$	1	2	3	4	5	6	7	8	9	10
				$Guilt_d$	1	2	3	4	5	6	7	8	9	10
E	An error occurred that may have contributed to or resulted in temporary harm to the patient and required intervention.	0	1	$Fear_e$	1	2	3	4	5	6	7	8	9	10
				$Shame_e$	1	2	3	4	5	6	7	8	9	10
				$Guilt_e$	1	2	3	4	5	6	7	8	9	10
F	An error occurred that may have contributed to or resulted in temporary harm to the patient and required initial or prolonged hospitalization.	0	1	$Fear_f$	1	2	3	4	5	6	7	8	9	10
				$Shame_f$	1	2	3	4	5	6	7	8	9	10
				$Guilt_f$	1	2	3	4	5	6	7	8	9	10
G	An error occurred that may have contributed to or resulted in permanent patient harm.	0	1	$Fear_g$	1	2	3	4	5	6	7	8	9	10
				$Shame_g$	1	2	3	4	5	6	7	8	9	10
				$Guilt_g$	1	2	3	4	5	6	7	8	9	10

Category of Medication Error		Have you experienced this category of medication error?		How would you rate the effect of this category of medication error on your personal/professional self?										
Category	*Description*	*No*	*Yes*		Never									Always
H	An error occurred that required intervention necessary to sustain life.	0	1	$Fear_h$	1	2	3	4	5	6	7	8	9	10
				$Shame_h$	1	2	3	4	5	6	7	8	9	10
				$Guilt_h$	1	2	3	4	5	6	7	8	9	10
I	An error occurred that may have contributed to or resulted in the patient's death.	0	1	$Fear_i$	1	2	3	4	5	6	7	8	9	10
				$Shame_i$	1	2	3	4	5	6	7	8	9	10
				$Guilt_i$	1	2	3	4	5	6	7	8	9	10

M2. Please use the open space below to tell me in your own words how your most memorable medication error has impacted your personal/professional self.

M3. Please tell me how you would **BEST** feel supported after experiencing a medication error:

[ ] Talk about it with peers at work$_1$ [ ] Not talk about it at work at all$_2$ [ ] Talk about it with my family$_3$ [ ] Enable me to take a break$_4$ [ ] Enable me to go home$_5$

[ ] Talk about it with my supervisor$_6$ [ ] Talk with Wellness Team$_7$ [ ] Interprofessional Post-Event Review$_8$ [ ] Resilience Education Support Team (REST) emergent visit$_9$ [ ] Employee Assistance Program$_{10}$

Section III: Demographics

Please provide the following demographic information about yourself:

D1. What is the year you were **FIRST** professionally licensed?:_____

D2. What is the year you began working in your CURRENT CHCO work area/role?: _____

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Appendix F

CITI Training Certification

Completion Report

Page 1 of 1

CITI Collaborative Institutional Training Initiative

Human Research Curriculum Completion Report
Printed on 12/1/2012

Learner: Kristin Belderson (username: kristin.belderson@childrenscolorado.org)
Institution: Regis University
Contact Information Department: RH-LHSON
Email: kristin.belderson@childrenscolorado.org
Social Behavioral Research Investigators and Key Personnel:

Stage 1. Basic Course Passed on 09/27/12 (Ref # 8854125)

Required Modules	Date Completed	
introduction	05/29/12	no quiz
History and Ethical Principles - SBR	09/27/12	4/5 (80%)
The Regulations and The Social and Behavioral Sciences - SBR	09/27/12	5/5 (100%)
Assessing Risk in Social and Behavioral Sciences - SBR	09/27/12	4/5 (80%)
Informed Consent - SBR	09/27/12	5/5 (100%)
Privacy and Confidentiality - SBR	09/27/12	4/5 (80%)
Regis University	09/27/12	no quiz

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

Return

Appendix G

Institutional Review Board (IRB) Approval Letters

University of Colorado Anschutz Medical Campus

Colorado Multiple Institutional Review Board, CB F490
University of Colorado, Anschutz Medical Campus
13001 E. 17th Place, Building 500, Room N3214
Aurora, Colorado 80045

303.724.1055 [Phone]
303.724.0990 [Fax]
COMIRB Home Page [Web]
comirb@ucdenver.edu [E-Mail]
FWA00005070 [FWA]

University of Colorado Hospital
Denver Health Medical Center
Veteran's Administration Medical Center
The Children's Hospital
University of Colorado Denver
Colorado Prevention Center

Certificate of Approval

20-Jun-2013

Investigator:	Kristin Belderson
Sponsor(s):	
Subject:	COMIRB Protocol 13-1372 Initial Application
Effective Date:	14-May-2013
Expiration Date:	13-May-2014
Expedited Category:	7
Title:	Nurses' Experience with Medication Error

Description:

APP001-3

Response to Minor Mods

All COMIRB Approved Investigators must comply with the following:

- For the duration of your protocol, any change in the experimental design/consent and/or assent form must be approved by the COMIRB before implementation of the changes.
- Use only a copy of the COMIRB signed and dated Consent and/or Assent Form. The investigator bears the responsibility for obtaining from all subjects "Informed Consent" as approved by the COMIRB. The COMIRB REQUIRES that the subject be given a copy of the consent and/or assent form. Consent and/or assent forms must include the name and telephone number of the investigator.
- Provide non-English speaking subjects with a certified translation of the approved Consent and/or Assent Form in the subject's first language.
- The investigator also bears the responsibility for informing the COMIRB immediately of any Unanticipated Problems that are unexpected and related to the study in accordance with COMIRB Policy and Procedures.
- Obtain COMIRB approval for all advertisements, questionnaires and surveys before use.
- Federal regulations require a Continuing Review to renew approval of this project within a 12-month period from the last approval date unless otherwise indicated in the review cycle listed below. If you have a restricted/high risk protocol, specific details will be outlined in this letter. Non-compliance with Continuing Review will result in the termination of this study.

You will be sent a Continuing Review reminder 75 days prior to the expiration date. Any questions regarding this COMIRB action can be referred to the Coordinator at 303-724-1055 or UCHSC Box F-490.

Review Comments:

This expedited approval includes the following documents:
Application v. 04.21.2013
Attachment F

Attachment M: Full Waiver of Consent: Determined to meet criteria for full waiver of consent.
Protocol
Survey
Script

Affiliated Sites:
Children's Hospital Colorado

Please note that COMIRB will no longer be E-mailing approved documents. Stamped, approved documents can be retrieved in the eRA (InfoEd) system. Please click here to access instructions on finding these uploaded documents. Documents will be available within the next 48 hours.

Sincerely,

UCD Panel C

Please provide your feedback on IRB processes and support

REGIS UNIVERSITY

Academic Affairs
Academic Grants

3333 Regis Boulevard, H-4
Denver, Colorado 80221-1099

303-458-4206
303-964-3647 FAX
www.regis.edu

IRB – REGIS UNIVERSITY

July 15, 2013

Kristin Belderson
10561 Wagon Box Circle
Highlands Ranch, CO 80130

RE: IRB #: 13-202

Dear Ms. Belderson:

Your application to the Regis IRB for your project, "Nurses' Experience with Medication Error," was approved as an expedited study on June 13, 2013. It is approved per OHRP Category of Research #7.

If changes are made in the research plan that significantly alter the involvement of human subjects from that which was approved in the named application, the new research plan must be resubmitted to the Regis IRB for approval. Projects which continue beyond one year from their starting date require IRB continuation review. The continuation should be requested 30 days prior to the one year anniversary date of the approved project's start date. A completion report of the findings of this study should be sent to the IRB.

In addition, it is the responsibility of the principal investigator to promptly report to the IRB any injuries to human subjects and/or any unanticipated problems within the scope of the approved research which may pose risks to human subjects. Lastly, a final report should be submitted at completion of the project and it is the responsibility of the investigator to maintain signed consent documents for a period of three years after the conclusion of the research.

Sincerely,

Patsy McGuire Cullen

Patsy McGuire Cullen, PhD, CPNP
Chair, Institutional Review Board
Associate Professor and Director
Department of Accelerated Nursing
Loretto Heights School of Nursing
Rueckert-Hartman College for Health Professions
Regis University

cc: Dr. Alma Jackson