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Agency for Safety in Perinatal Nursing Practice

by

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"Be grateful for luck.

Pay the thunder no mind.

Listen to the birds.

And don't hate nobody."

~ Eubie Blake

Agency for Safety in Perinatal Nursing Practice

Audrey Lyndon

Assertive communication has been identified as key to maintaining safe operations in inpatient perinatal care. Perinatal nurses are positioned to detect and deflect evolving threats to patient safety, but evidence suggests nurses do not always take assertive action in response to clinical problems, and may be ignored when they do raise concerns. In contrast, evidence also suggests a direct effect for nursing on patient safety, but little is known specifically about how nurses keep patients safe. The purpose of this study was to articulate the direct contributions perinatal nurses make to maintaining safe care, and to identify processes affecting nurses' and other clinicians' agency for safety, or willingness to take a stand on issues of concern.

This grounded theory study was conducted in two urban academic perinatal units with a purposive sample of 12 registered nurses, 5 physicians, and 2 certified nurse-midwives, using semi-structured interviews and participant observation. Data were collected and analyzed in an iterative fashion using the constant comparative method, dimensional, and situational analysis.

Nurses maintained safety during labor and birth through *skillful anticipation* of the potential embedded in given clinical situations. They integrated medical and technical knowledge and skill with intimate knowledge of the woman and the operational context of care. Conditions and processes promoting skillful anticipation included *being prepared, knowing,* and *envisioning the whole picture*. Lack of available resources, fatigue, and environmental distractions challenged skillful anticipation and patient safety.

Agency for safety fluctuated for all types of providers depending on the specifics of the situation. Agency was strongly influenced by interpersonal relationships. While physicians and CNMs believed they valued nurses' contributions to care, the units had deeply embedded hierarchies. Nurses were structurally excluded from important sources of information exchange and from contributing to the plan of care. Pervasive, mutually reinforcing segregation of activities by discipline impeded information flow, challenging safety. Nurses' confidence in their assessments was a key driver for asserting their concerns. Confidence was undermined in novel or ambiguous situations and by poor relationships, resulting in a process of *redefining the situation as a problem of self* and potential lack of persistence regarding their concerns.

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Introduction

In the eleven years prior to entering the doctoral program, I spent three years practicing as a labor and delivery nurse and eight years practicing as a Perinatal Clinical Nurse Specialist. A question that developed over this time, and persisted in my years of Perinatal Clinical Nurse Specialist practice, related to the observation that perinatal nurses demonstrated a wide range of skill in recognizing critical patient care situations, and in their willingness to take decisive action to correct those situations. Examples of the types of clinical situations that puzzled me included:

1) Numerous examples of nonreassuring fetal heart rate tracings or uterine hyperstimulation where the nurse was concerned about fetal and/or maternal status and brought this to the attention of the physician or certified nurse-midwife (CNM), but took no further action when ordered to continue oxytocin. While some nurses would refuse to continue the oxytocin and/or request the provider make a bedside evaluation of the patient's condition, there were also consistently cases where nurses would shrug and say, "Well, I told the doctor. The doctor knew what was going on."

2) I arrived early at work one morning and was asked to go to postpartum by the Clinical Coordinator. The postpartum charge nurse met me at the door with a tale of great frustration from the night shift. A woman at approximately 26 weeks gestation had been admitted during the night with suspected pyelonephritis. The patient had a high fever and developed tachycardia. The nurses were "very worried" and had called the physician multiple times throughout the night. They had repeatedly been told that everything was fine, and the physician would be in to see the patient in the morning. The nurses were outraged that the physician didn't "see" the clinical picture and come in to evaluate the patient. When asked what time the physician had been asked to come in, the charge nurse

said, “I don’t think I ever said those words. I thought he should have known. He should have known – we kept calling him.” Many situations played out in a similar fashion; yet at the same time many other situations were dealt with quickly when nurses insisted on immediate assessment and intervention for patients showing signs of deterioration. I began to wonder what the determinants of these differences were.

At about the same time that I began thinking about these practice variations, the concept of the High Reliability Perinatal Unit was introduced in a publication by Knox, Simpson, and Garite. This piqued my interest in organizational influences on perinatal safety, and in how nurses act on and communicate their concerns to physicians and CNMs. Soon, several perinatal providers were regularly writing and talking about the importance of assertive communication in maintaining safe operations, and at least one major health system implemented a perinatal safety project founded on the aviation safety principles of crew resources management. As I attended several perinatal safety conferences, I was struck by the nurses’ reactions. Everyone was excited and saw the potential for major improvements in practice. The nurses were also skeptical: could this really change nurse-physician relationships and transform perinatal care?

It had become painfully clear that poor communication and poor teamwork were resulting in harm to mothers and babies, and that perinatal teamwork needed to improve. However, most nurses I spoke with and had worked with in my career (myself included), had been honing their indirect and often manipulative communication skills to a high art in pursuit of meeting patients’ needs through use of the “doctor-nurse game.” While a few had always been direct, most had minimal experience with making direct requests and clear statements of concern. From these conversations I began to wonder what

perinatal nurses would need to become comfortable with direct communication and assertion of concerns. It seemed clear to me from a safety perspective and from perinatal nurses' reactions to the topic that this was an important issue needing exploration, and was at least a piece of the practice variation I was observing clinically.

My initial plan for exploring this issue was to develop an instrument for measuring perinatal nurses' self-efficacy for assertion. However, I quickly discovered that the construct of "assertive behavior" as developed in the psychological literature had little correspondence to the definition of "assertive communication" in the safety literature. Literature searches revealed that the current psychological literature, "assertive behavior" is most often associated with studies of deviance and criminality, and therefore not applicable to the present problem. Investigation of the studies used to develop standard measures of "assertive behavior" revealed extremely poor methodology. In addition, positive assertion in these instruments is defined by behaviors like paying a compliment to another person (Eisler, Miller & Hersen, 1973), which does not have face validity for the safety definition of "stating concerns with persistence until there is a clear resolution" (Preston, 2003).

I then began to explore the aviation literature on the development of crew resource management, for which there has been great enthusiasm in healthcare safety circles. From this research I learned that the principles of crew resource management and the attitude measures used to assess aviation safety culture were initially developed from *talking to pilots about flying* in addition to analyzing safety incidents. This is a conversation we have yet to have with clinicians in a detailed way, and I believe that skipping this conversation presents an ongoing threat to patient safety because it means

we have neglected to account for the day-to-day realities in which nursing and medicine are practiced.

The very important shift to system-level thinking in patient safety promoted by the Institute of Medicine (Kohn, Corrigan & Donaldson, 2000) has also tended to neglect the positive role individuals and groups play in *creating safety* through active detection and deflection of potential harm (Rochlin, 1999). When safety studies focus primarily on the incidence and mechanisms of making errors, important opportunities for increasing safety through increasing individual and collective agency for creating and maintaining safety may be irretrievably lost. Finally, although attention to the nurse's role in creating patient safety is growing, the vast majority of systems improvement efforts have been directed at physicians, who have been erroneously perceived as the "front line" of patient care (Blatt, Christianson, Sutcliffe & Rosenthal, 2006; Rothschild et al., 2006).

The purpose of this study was two-fold: to identify structures and processes that facilitate and constrain both individual nurse and collective agency for safety in inpatient perinatal settings, and to describe the direct contributions perinatal nurses make to maintaining safe care during labor and birth. My underlying assumptions, based on clinical experience and review of the literature include:

1) Intervening assertively in evolving clinical situations improves outcomes for childbearing families by preventing or mitigating potential harm to patients.
2) Poor communication and lack of assertion in dynamic patient care situations are common in perinatal care environments, and contribute to preventable negative maternal and perinatal outcomes.

3) There is a fairly broad range of skill and willingness to intervene assertively among perinatal nurses in most inpatient settings.
4) Variation in these skills may be related to a number of factors or processes occurring in the care environment that have not yet been articulated.

The dissertation is organized into four papers. The first paper presents an integration of organizational accident and high reliability theory with a symbolic interactionist approach to illustrate how the combination of these theories may constitute a productive approach to the research problem. This paper has been submitted to *Journal of Advanced Nursing.* Paper two is a review of the literature related to the application of crew resource management techniques to communication and teamwork issues in patient care. This paper was published in *Journal of Obstetric, Gynecologic, and Neonatal Nursing* and is reprinted permission from Blackwell Publishing. The third paper addresses study results regarding facilitators and constraints of agency for safety among nurses, physicians, and certified nurse-midwives in the two urban academic perinatal study settings. This paper is in review at the *Journal of Obstetric, Gynecologic, and Neonatal Nursing.* The final paper presents results on the nurse only subset of study participants and describes some of the nurses' direct contributions to providing safe care during labor and birth. This paper has been submitted to *Quality and Safety in Healthcare*. The final paper is followed by a synthesis of findings and discussion of clinical implications and directions for future research.

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Paper 1

Conceptual Approaches to Perinatal Nurse Agency for Safety

Audrey Lyndon

Abstract

Aim: To delineate a conceptual framework for understanding the role of the perinatal nurse in maintaining safety during labor and birth in the acute care setting.

Background: Perinatal nurses are uniquely positioned to observe, evaluate, and act upon changes in a patient's condition. They play a central role in keeping patients safe in the complex, high-hazard domain of the modern inpatient birth setting. Adverse events in perinatal care are rare. However, the rarity of adverse events and normalcy of birth make inpatient perinatal settings particularly vulnerable to the normalization of deviance in care processes, which do have the potential for catastrophic outcomes.

Methods: Discussion of three theoretical perspectives to develop a conceptual framework for evaluating the perinatal nurse's agency for safety, or ability and willingness to take a stand on an issue of concern. A clinical scenario is presented to illustrate the contributions of the various perspectives.

Results: Communication and teamwork problems are leading causes of documented preventable adverse outcomes in perinatal care. An essential component of perinatal safety is an organizational culture in which all clinicians have individual and collective authority to question the plan of care and the agency to change the direction of a clinical situation in the patient's best interest. This collective agency for safety and commitment to support nurses in executing their advocacy role is missing in many perinatal care settings.

Conclusion: Integration of perspectives provides critical flexibility for navigating individual, group, and system levels of analysis in understanding agency for safety in perinatal care.

Patient safety and the nurse's central role in providing safe care have recently come to the forefront of national and international health care discussions (Aiken, Clarke, Sloane, Sochalski & Silber, 2002; Institute of Medicine, 2001; Kohn, Corrigan & Donaldson, 2000; Page, 2004). In 2000, the Institute of Medicine (IOM) estimated that between 44,000 and 98,000 deaths occur in the United States (U. S.) each year as a direct result of errors in care (Kohn et al., 2000). The IOM and others have acknowledged the importance of nurses' work in maintaining safety through preventing complications and errors (Aiken et al., 2002; Page, 2004). However, the exact nature of nurses' safety work has only barely begun to be concretely defined (Henneman, Blank, Gawlinski & Henneman, 2006). The purpose of this paper is to review salient theoretical underpinnings of safety research and delineate a conceptual framework for understanding the role of registered nurses in maintaining patient safety in the inpatient perinatal care environment.

Organizational accident theory (OAT) became the overarching framework for understanding medical error when it was adopted by the IOM (Kohn et al., 2000). The OAT approach has been essential to moving the analysis of health care accidents away from a sole focus on the individual provider residing at the "sharp end" of care when an accident occurs. From an OAT perspective, accidents are set in motion by the consequences of decisions made at levels far removed from the end user. Unforeseen, unintended consequences of decisions regarding allocation of resources, organizational processes and priorities, equipment maintenance and replacement cycles, and responses to regulation become latent failures that are transmitted through the organization, creating local conditions that set the stage for active failures. These latent conditions can be

conceptualized as “resident pathogens” (Reason, 1990, p. 197) lying dormant in the system until a confluence of events occurs triggering the release of their destructive potential. Complex systems have multilayered sets of defenses designed to maintain safety over time. Therefore, most latent failures are deflected by system defenses before active failures can occur. However, on occasion gaps in the layers of defenses “line up” allowing latent errors to combine with local conditions, generating active failures with catastrophic consequences (Reason, 1990, 2000, 2004).

Two principle lessons of OAT are a) errors are unavoidable side effects of normative cognitive processes, and b) analysis of error should focus on understanding the underlying conditions or system level failures promoting individual errors and violations. These have become the primary framework for the patient safety movement. Other theorists propose, however, that the lessons of individual accidents may be less useful for safety learning than was previously understood because no two accidents evolve in the same way (Rasmussen, 2003/1990; Woods & Cook, 2004). In fact, redesigning systems based on accident analysis may dangerously increase system complexity without fundamentally improving safety (Rochlin, 1999). Rochlin argues that an overly narrow focus at the systems level can undermine safety by obscuring the effects of individual and collective actions in detecting and deflecting sources of danger. These theorists suggest that research to improve safety should be focused on the acceptable boundaries of human adaptations to evolving conditions in dynamic environments, as exemplified by high reliability organizations (Rasmussen, 2003/1990; Weick & Sutcliffe, 2001; Woods & Cook, 2004).

High reliability organizations (HROs) operate without accidents for long periods of time in high-hazard domains such as aviation and nuclear operations (Knox, Simpson & Garite, 1999; Weick & Sutcliffe, 2001). The aviation industry safety program of crew resource management training, which emphasizes flattening hierarchies and promoting inquiry and assertive communication from junior team members, has been cited as a promising HRO model of safety improvement for application to healthcare environments and perinatal care (Helmreich, 2000; Leonard, Graham & Bonacum, 2004; Thomas, Sexton & Helmreich, 2004). HROs manage the contributions of latent conditions as causative agents in accidents through collective responsibility for identifying and managing continuously evolving threats. Safety is not conceptualized as the elimination of risk in an HRO, but as a social construct of collective agency for the detection and management of evolving and unpredictable threats (Rochlin, 1999).

HROs cultivate collective agency for safety by focusing on potential as well as actual failures, resisting oversimplification, and maintaining an infrastructure of respect, attentiveness, communication, and competence (Weick & Sutcliffe, 2001). Recent studies of safety climates and behaviors in health care settings demonstrate a significant gap between the current state of interpersonal relationships and the desired goal of collective agency for safety (Cook, Hoas, Guttmannova & Joyner, 2004; Maxfield, Grenny, McMillan, Patterson & Switzer, 2005; Sutcliffe, Lewton & Rosenthal, 2004). While OAT and HRO theory provide performance goals and illuminate the gap between reality and desired conditions of collective agency, they do not provide an explanation for *why* these goals have been difficult to achieve in health care settings. The conceptualization of safety as a dynamic social process of collective agency and adaptation calls for a

theoretical approach capable of incorporating consideration of individual, group, and organizational interactional processes in exploring this gap. Symbolic Interactionism is such an approach.

Symbolic Interactionism (SI) is a framework for studying human behavior. SI scholars strive to understand and provide a contextualized explanation of human agency through studying the importance of meanings for behavior, self-concept, and interactional processes for considering individual and group action within the context of societal constraints (Blumer, 1969; Musolf, 2003). Symbolic interactionists assume that humans act on the basis of the meaning things have for them and that meaning arises through the process of interaction (Blumer, 1969). Self-concept is developed through social interaction and is recognized as an important motive for behavior. Individual and group actions are influenced by attitudes and subjective definitions of the situation in the context of continual interaction with others, self, and environment (Blumer, 1969; LaRossa & Reitzes, 1993). SI provides a framework for understanding how clinicians may modify their understanding of clinical situations based on individual, group, and organizational interactions.

Although both OAT and SI provide important perspectives for considering patient safety issues, neither theory fully explains the absence of strong collective agency for safety in many health care environments. Integration of SI's focus on social interaction with concepts from OAT can provide a more directed analysis of how clinicians successfully adapt, fail to adapt, or select adaptations that fail to address threats to patient safety (Dekker, 2003; Woods & Cook, 2004).

The Perinatal Nurse's Role in Patient Safety

The IOM report and subsequent analyses consistently identified communication problems as a leading cause of system breakdown in patient care (Kohn et al., 2000; Page, 2004). This trend has been borne out in the perinatal arena as well. From cases in their sentinel event database, the Joint Commission on Accreditation of Health Care Organizations (JCAHO) identified communication problems as a primary contributing factor in 80% of preventable infant morbidity and mortality (JCAHO, 2004, 2006). Provider factors are also thought to contribute to preventable maternal morbidity and mortality (Geller et al., 2004; Kilpatrick, Crabtree, Kemp & Geller, 2002).

OAT has recently been used to integrate practical experience from HROs in the analysis of perinatal accidents (Simpson & Knox, 2003). This work highlights assertive communication as centrally important in maintaining safe operations and key for creating patient safety and effective teamwork in the perinatal environment (Knox, 2003; Leonard, Graham, & Bonacum, 2004; Simpson & Knox, 2003). Assertive communication may be considered a proxy for agency because it is a manifestation of a clear sense of action toward the assurance of safety. However, in their review of patient safety, human factors, and adverse obstetric events, Simpson and Knox identified four repetitive themes in near-misses and injuries: 1) concerns were not directly expressed; 2) problems were not clearly stated; 3) actions were proposed, but not taken; and 4) decisions were either not reached or not acted upon.

Based on these findings and aviation experience with team training techniques, training in assertive communication has become a major focus of interventions to improve safety in perinatal care (Knox, 2003; Leonard et al., 2004; Preston, 2003;

Simpson & Knox, 2003). In this context, assertion is defined as, “An individual provider asserts their opinion (through questions or statements of opinion) during critical times,” (Thomas et al., 2004) or “Individuals speak up and state their information with appropriate persistence until there is a clear resolution” (Preston). A search of PubMed and the Social Science Abstracts databases revealed a focus on assertive behavior in the context of deviance and criminality rather than on assertive communication. Examination of early psychological studies on the concept of assertion also demonstrated very limited generalizability to healthcare and patient safety due to significant methodological weaknesses. The limited studies available on assertive behavior in nurses were based on narrowly defined constructs with conflicting results (Gerry, 1989; Kilkus, 1993; Timmins & McCabe, 2005). Thus, knowledge is limited about the skills of perinatal nurses in assertively engaging clinical problems (Timmins & McCabe, 2005).

Emphasizing assertive communication is an appealingly simple strategy for improving perinatal safety. However, studies of healthcare providers have consistently demonstrated significant and longstanding problems with communication, respect, and conflict in inter-professional relationships in health care settings (Rosenstein, 2002; Sexton et al., 2006; Simpson, James & Knox, 2006; Thomas, Sexton & Helmreich, 2003). It is questionable whether the importation and application of concepts from other fields can overcome this long-standing inter-professional conflict in the absence of a baseline understanding of the contextualized experiences of health care providers in working to provide safe care (Lyndon, 2006).

The nurse is the primary gatekeeper of observations, interventions, treatments, and often the management of labor in inpatient perinatal setting (James, Simpson &

Knox, 2003; Page, 2004). The active role of identifying and assertively deflecting the slips, lapses, and organizational problems that place patients in harm's way (Gaba, 2000; Reason, 1990) and communicating these issues to the team thereby falls disproportionately to the perinatal nurse (Lyndon, 2006). Understanding nurses' perceptions of their own use of assertion and the factors that facilitate or constrain their effectiveness or their sense of agency is critical to improving communication skills, and an important aspect of building and maintaining safe patient care systems (Lyndon, 2006).

Necessary Conditions for Action

Assertive communication is needed when there is a breakdown in understanding among team members about which actions or plans are in the patient's best interest. Three conditions are fundamental to the nurse's ability to take action and communicate assertively on the patient's behalf: a) adequate knowledge and clinical preparation, b) accurate understanding of the clinical situation, and c) agency to take a stand on issues of concern (Benner, Hooper-Kyriakidis, & Stannard, 1999). All appropriately trained perinatal nurses theoretically possess adequate knowledge and clinical preparation for safe practice, thus this condition is considered a baseline requirement for nursing practice and will not be discussed here.

Accurate clinical understanding. Cognitive psychologists and nurse phenomenologists alike have described the importance of an intuitive understanding of the overall clinical situation. Benner, Tanner, and Chesla (1996) call this understanding clinical grasp, while cognitive psychologists call it situation awareness (Endsley, 1995, 2000). In either model this understanding, or "knowing what's going on" (Endsley,

1995), is fundamental to the dynamic decision making required of healthcare providers facing evolving clinical circumstances.

Situation awareness (SA) is defined as "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projecting of their status into the near future" (Endsley, 1995, p.36). SA occurs on several levels: 1) the perception of cues in the environment, 2) the combination, interpretation, storage, and retention of multiple sources of information, 3) determination of their meaning and relevance to operational goals, and 4) the ability to forecast near future situation events and dynamics from the present situation. Threats to SA may occur on any of these levels (Endsley, 1995, 2000). Typical threats in the inpatient birth setting include expectations regarding self and other team member roles and behaviors, the nature of relationships with childbearing families, communication patterns, and team hierarchy. Other common threats to SA include sleep deprivation and fatigue (Harrison & Horne, 2000), as well as fixation on particular cues (Endsley, 1995; Preston, 2003), such as perceived imminence of vaginal birth at the expense of other pertinent information such as a deteriorating fetal heart rate tracing.

Agency. Physicians, nurses, and certified nurse-midwives (CNMs) all take the role of "patient advocate" in that they are charged with acting in the interest of the patient, and their individual agency for asserting their concerns derives from this role. However, their individual and organizational authority for agency in the patient advocate role differs. Physicians and CNMs have a clear regulatory and organizational sanction to act on the patient's behalf as the formal authorities (within their respective domains of perinatal care) on treatment decisions. They assert their agency through determining

treatment plans and ordering specific types of treatment. In many U.S. settings physicians and CNMs are not employed by the hospitals where women give birth, rather they are independent attendants and viewed as highly valued customers by virtue of attracting patients to the hospital (Brown, 2005a, 2005b; Knox & Simpson, 2004).

Nurses also have regulatory and ethical authority for acting in the patient's best interest. US nurses' agency to assert their concerns "with appropriate persistence until there is a clear resolution" (Preston, 2003) flows directly from licensure and the American Nurses Association (ANA) Code of Ethics, both of which direct them to intervene when patients' safety or other interests are threatened (ANA, 2001; Knox & Simpson, 2004). The International Council of Nurses (ICN) Code of Ethics similarly directs nurses to maintain safety (ICN, 2006). However, nurses' ability to persist can be impaired by their subordination to the medical profession and their low organizational status. Nurses contributions to patient outcomes and safety have also been under-recognized and under-valued (Benner, 1984; Knox & Simpson, 2004). Nurses are placed in a difficult bind when their historical position in the medical hierarchy conflicts with their legal and ethical duty to "advocate for, and strive to protect the health, safety, and rights of the patient" (ANA, 2001, p.12; Knox & Simpson, 2004). This mandate is not coupled with the administrative support for its achievement in many settings (Schroeter, 2000, 2002). Multiple barriers to nurses' agency to assert their concerns exist in health care settings in the form of oppressive hierarchies and fears of job loss, discipline, harassment, and retribution (Grace, 2001; Hewitt, 2002; Knox & Simpson, 2004; Mallik, 1997). Nurses are likely to experience significant role conflict in executing their agency for safety because competing role expectations may simultaneously call for potentially

opposing behaviors of self-protection and patient advocacy from the same individual (Stryker, 2002/1980).

Stryker (2002/1980) has argued that any social structure consisting of partially overlapping and partially independent networks of interaction, such as the inpatient birth setting, "is fertile soil for the production of role conflict" (p. 73). He describes two primary mechanisms for managing role conflict: withdrawing from relationships, and isolating conflicting expectations through structuring or phasing interactions to separate conflicting expectations. There is minimal opportunity for the perinatal nurse to withdraw from or structure interactions in the course of clinical practice. This emphasizes the importance of Stryker's observation that social structure is profoundly important in conditioning the possibilities of response in reaction to role conflict. Stryker theorized that individuals manage role conflict through establishing interactional role bargaining to minimize the costs of conflict. This may be exhibited by perinatal nurses as "the doctor-nurse game," in which nurses use manipulative communication techniques to make suggestions without appearing to threaten the physician's position as the authoritative decision-maker (Rosenstein, 2002) or by silencing their concerns in deference to physician or CNM authority.

Both the history and appropriateness of patient advocate as a role for nursing are somewhat controversial (Grace, 2001; Hewitt, 2002; Mallik, 1997; Schroeter, 2000), and perinatal nursing encompasses a diverse array of sub-roles. Therefore, nurses may experience, both individually and collectively, challenges to their sense of agency and a lack of clarity around role expectations in asserting their concerns as patient advocates. This may be particularly true for nurses from other cultures working in U.S. settings,

where the expectation to challenge authority may be stronger than in their home country (Priest, 2005). These issues can be expected to have a negative effect on the quality of enactment of the role of patient advocate when it requires nurses to challenge their traditionally subordinate role in the medical hierarchy.

This discussion leads to the following propositions for understanding perinatal nurse behavior in dynamic patient care situations:

1) The diversity of the perinatal nurse sub-roles results in decreased commonality and clarity of expectations and increased role conflict for perinatal nurses.
2) This decreased clarity of perinatal nurse role expectations and increased role conflict creates difficulty in executing the patient advocate role through assertive communication.
3) Strongly sanctioned hierarchical roles in health care organizations decrease the agency of perinatal nurses to assert their concerns to higher status members of the health care team.
4) Increased comfort with moving between roles or modifying roles decreases the effects of role strain, thereby increasing the perinatal nurse's ease in taking the role of patient advocate and asserting concerns with appropriate persistence.

The following clinical example illustrates how nurses and other clinicians may be affected by interactional processes. The contributions of OAT, HRO, and SI to understanding threats to agency for safety in perinatal care are then discussed.

Clinical Illustration

A childbearing woman was cared for during labor in an urban US teaching hospital with a diverse array of clinical providers including perinatal nurses, obstetrics

and gynecology residents, CNMs, obstetricians, and perinatologists. The woman was being attended by a resident and a CNM. The CNM was the attending provider for “low-risk” laboring women, and was responsible for supervising the resident. A senior perinatologist was supervising more senior residents in the care of “high-risk” antepartum and laboring women.

At the change of shift, an experienced nurse came on duty in the birth center and took over the care of the woman who was in active labor with oxytocin infusing and an epidural in place. The patient complained she did not feel well. The nurse observed that the patient did not look well, had elevated maternal and fetal heart rates, and recurrent late decelerations. The nurse was concerned about these signs of potential clinical deterioration and requested a bedside evaluation by the CNM. The nurse and the CNM agreed it would be appropriate to request an evaluation by the perinatologist. The perinatologist came to the bedside and evaluated the patient, who had progressed to the second stage of labor. No management changes were proposed, and the perinatologist planned to return in one hour to check on the woman’s condition. At that time the nurse thought an hour was too long to “watch and wait,” but she trusted the perinatologist’s expertise and agreed to the plan without voicing her misgivings. The CNM also deferred to the perinatologist.

Over the subsequent hour the fetal heart rate tracing continued to deteriorate. During this time, the charge nurse was managing a full unit with several urgent patient care demands occurring simultaneously. The charge nurse periodically checked the fetal heart rate tracing on the central monitor and noted the tracing was worsening, but she also

knew the unit's most trusted clinicians were working with this family, and she was confident the situation would be handled appropriately.

Thirty minutes later the nurse and CNM agreed to call for a re-evaluation of the situation. The chief resident and the perinatologist came in and the team agreed to move to the operating room and attempt an assisted birth. As the team moved the patient to the operating room, the nurse was thinking about how much time they had to get the baby born, noting the fetal heart rate tracing's further deterioration and the increasing urgency of the situation. In the operating room the nurse noted the chief resident was consenting the patient in a non-urgent fashion, and the perinatologist was not present to supervise the birth. The nurse said to the chief resident, "We've got to *MOVE* [get the baby born now]!"

In the meantime, the charge nurse checked the central monitor and wondered why this birth was taking so long. She entered the operating room and immediately observed the chief resident ready to apply forceps, but the supervising perinatologist was not present. Someone paged the perinatologist, who came in and took over the birth. The infant was born with evidence of metabolic acidosis. In a retrospective review, both nurses identified a point on the fetal monitor tracing where the heart rate became very worrisome and called for intervention almost an hour prior to the time of the birth.

This scenario raises essential questions about communication, teamwork, and the function of the safety net in perinatal environments. During debriefing, several safety problems were identified: multiple and competing patient care demands occurred simultaneously on the unit; communication breakdowns resulted in confusion about who had been paged and when; the CNM experienced role confusion; the primary and charge

nurses failed to effectively communicate their level of concern to the attending perinatologist; and the chief resident and the perinatologist failed to grasp the urgency of the situation.

This case exemplifies some of the human elements that pose evolving threats to patient safety during the course of routine operations in dynamic, high hazard environments. Almost an hour after concern was first raised about both maternal and fetal condition; an acidotic baby was born operatively. What actions might have been taken to improve the situation, and what prevented these actions from occurring?

Analysis

A traditional systems approach to analyzing latent failures in the clinical situation might focus on improving the reliability of the paging system, policies or procedures for attending physicians to communicate their location to the nursing staff, and clarification of the CNM's role in supervising transitions to operative birth. Such activity would likely generate improvements in the organization's safety net. However, they might not prevent future adverse events because no two accidents evolve in exactly the same way, and each addition or change in system defenses has the potential to produce unanticipated consequences and increased system complexity (Rasmussen, 2003/1990; Rochlin, 1999).

An HRO approach would recognize that a failure in planning (a mistake) went unchallenged by junior team members. Corrections would likely focus on teamwork training to enhance junior members' skills in assertive communication, interdisciplinary fetal monitoring training to enhance the development of shared understanding of the meaning of fetal heart rate findings, and assessment of the unit's safety culture and attitudes (Helmreich, 2000; Knox & Simpson, 2004; Sexton, Thomas & Helmreich,

2000). These activities could also be expected to generate some improvement in the organization's safety net by improving the likelihood of effective communication among clinicians. However neither the traditional systems nor the high reliability perspective explains why the nurses and CNM were not able to communicate their concerns in a manner that convinced the physicians of the urgency of the situation.

An interactionist analysis directs focus to the social processes involved in negotiating complex clinical environments. Both nurses' (primary and charge) assessment of the clinical findings as concerning represented an opportunity for assertive communication; yet their trust that the perinatologist's expertise ensured an accurate interpretation of the situation presented a constraint, and at least temporarily altered their definitions of the situation as urgent. The charge nurse stated that her understanding of the situation was profoundly influenced by her perception of the expertise of the primary nurse and the perinatologist. The primary nurse also indicated she was strongly influenced by her perception of the perinatologist's expertise. Both nurses may also have responded to this interactional experience by doubting or actively silencing their concerns in response to previous interactions and experience with the medical hierarchy.

Role confusion was also identified by the CNM as a contributing factor in this case. As a supervising attending provider she was responsible for supervising the chief resident, yet as a CNM she was not an appropriate person to be directing the woman's care once the decision was made to attempt an operative birth. These contradictory roles produced conflict, potentially decreasing her effectiveness in taking the patient advocate role and asserting her concerns about the urgency of the situation. Likewise, the primary nurse may have experienced a lack of clarity around her own role expectations and strain

due to multiple demands and hierarchical organizational structure. Attention to these and other interactional processes at the individual and organizational level increase the depth of understanding by illuminating how situations can be re-defined as less urgent and influenced by history of previous actions, in addition to identifying latent conditions produced by organizational decisions made distant from the bedside.

Applying an Integrated Approach

Perinatal nurses play a central role in keeping patients safe during their encounters with the complex, high-risk domain of the modern inpatient birth setting. While overt adverse events are relatively rare in perinatal care, inpatient birth settings are particularly vulnerable to the normalization of deviance in care processes, which do have the potential for catastrophic outcomes (Knox et al., 1999). Communication and teamwork problems are the leading cause of documented adverse outcomes in the perinatal environment. An essential component of perinatal patient safety is an organizational culture in which all clinicians have individual and collective authority to question the plan of care and agency to "stop the line" (Knox, 2003) or change the direction of a clinical situation in the patient's best interest. This collective agency for safety and commitment to support nurses in executing their advocacy role is a distant reality in many, if not most, perinatal care settings (Knox & Simpson, 2004; Page, 2004).

The preceding discussion demonstrates that an integrated approach for analyzing interactional and systems processes is needed in order to fully elaborate how perinatal nurses contribute to patient safety. Complex sets of individual, interpersonal and systems issues potentially promote and inhibit the nurse's effective use of agency to maintain safety for childbearing families. The safety improvements garnered through developing a

culture of collective agency and improving communication and assertion skills among team members have been described in multiple high-risk settings. In other industries, however, the interpersonal relationships, even in strict hierarchies, are substantially different from the majority of healthcare settings (Tamuz & Thomas, 2006).

In many other high-hazard domains all personnel have both the authority and the responsibility to question superiors and make real-time adjustments to maintain safe operations as a top priority (Weick & Sutcliffe, 2001). In contrast, a culture of autonomous decision-making by physicians is dominant in hospital culture, and nurses' concerns are often not stated clearly or are ignored (Brown, 2005a, 2005b; Simpson & Knox, 2003). Additionally, there is often unequal status in settings when nurses are employees and physicians are revenue-generating customers (Brown, 2005a, 2005b; Knox & Simpson, 2004). An understanding of how these differences affect patient safety is a necessary step in creating an environment in which nurses can effectively enact the patient advocate role as needed to maintain safe perinatal care.

The development of such an understanding would take account of nurses' contextualized experiences of facilitators and constraints on their agency in evolving clinical situations. The necessary conditions for action described previously suggest the following factors can be expected to influence agency:

1) Personal and environmental factors such as experience level, hierarchy, perceptions of other team members, sleep deprivation, fatigue, production pressures, communication patterns, and role expectations may affect situation awareness (SA) of the nature and urgency of the patient's condition.

2) These same factors may affect the nurse's agency for safety by presenting competing personal and collective demands on attention to and prioritization of the problem.
3) The influence of culture and traditional communication patterns, including previous interactions between providers and organizational responses to speaking up, on nurse agency.

These overlapping influences are displayed in Figure 1. In addressing these areas of concern, attention must be given to individuals, groups, local and historical conditions, and exogenous factors such as race, class, gender, ethnicity, institutional power, and other oppressive conditions that may influence human interactions (LaRossa & Reitzes, 1993; Weigert & Gecas, 2003). The overlapping personal, environmental, and competing demands particularly highlight the potential for conflict and challenges to nurse agency in the areas of communication, role expectations, perceptions of other team members, and distraction, and illustrate the need for navigating between levels of observation and analysis.

(Insert Figure 1)

Engendering collective agency for safety and developing safety as a driving social construct for inpatient perinatal units are essential for maximizing safety in perinatal care. Doing so will first require identifying and removing currently underappreciated, taken-for-granted barriers, which will also require developing a fuller understanding the differences between inpatient perinatal settings and other high-hazard, high-reliability domains. Additional challenges to creating such a social construct include the fundamentally healthy and resilient nature the perinatal patient population, which tends to

obscure providers' awareness of danger and the risk for catastrophic consequences (Knox et al., 1999).

The contributions of early OAT direct attention to levels of the organizational system that may be far removed from the "action" of patient care to develop a fuller understanding of adverse events. The growth of OAT into the development of the high reliability framework for understanding how dynamic systems operate without error for long periods of time point back again to the individuals and collectives who function at the "sharp end" of patient care. This is the location for understanding how groups develop and maintain individual and collective agency for safety, and maintain this agency over time despite the continuing impingement of other organizational pressures and priorities. The synthesis of organizational accident theory, including the characteristics of high reliability organizations, with symbolic interactionism as a theoretical perspective provides a robust framework for navigating between the multiple levels of analysis necessary for understanding the complex problem of the perinatal nurse's ability to effectively express agency for safety.

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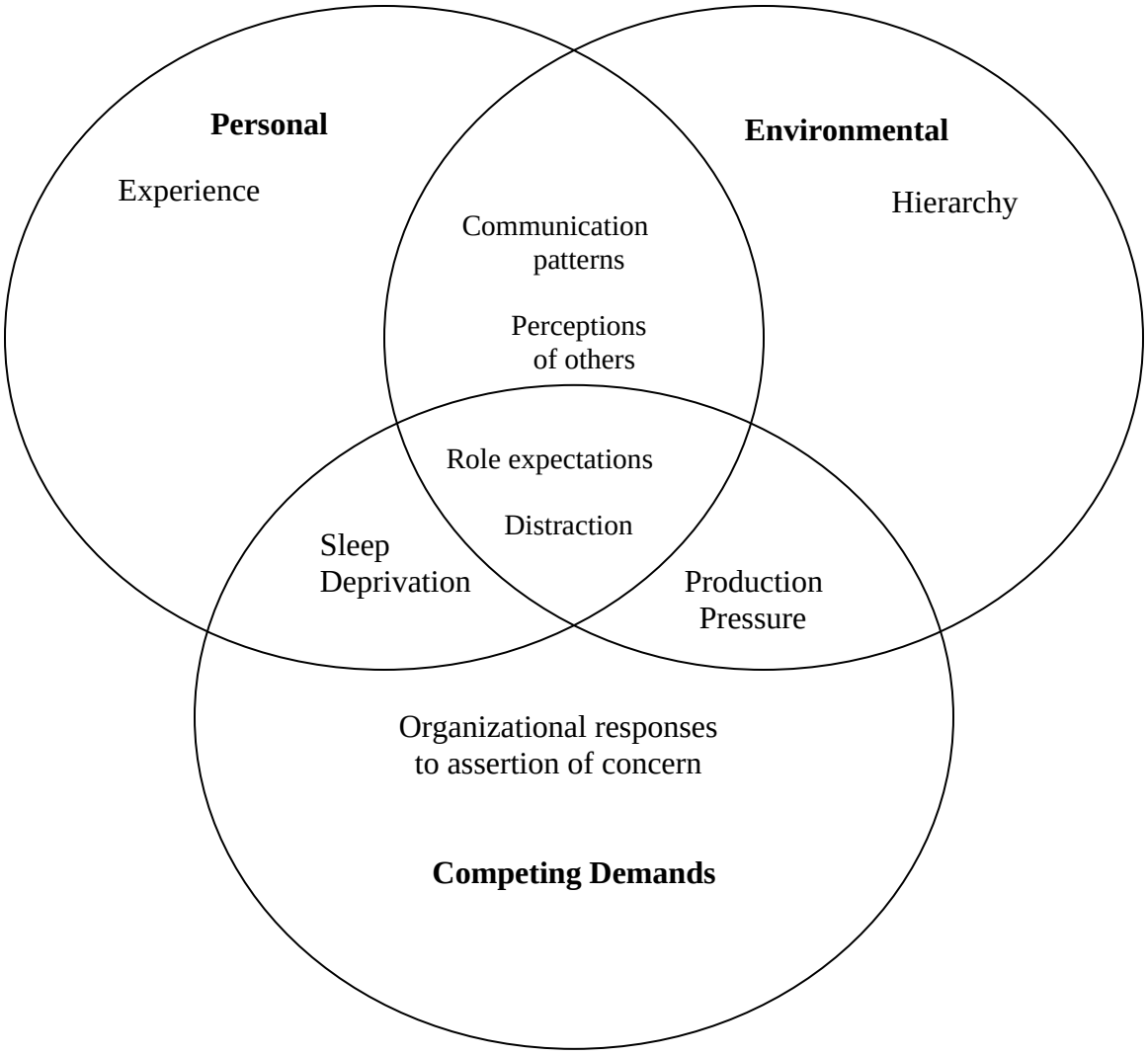
Figure 1. Factors expected to influence agency for safety.



Paper 2

Communication & Teamwork in Patient Care:

How Much Can We Learn From Aviation?

Lyndon, A. (2006). Communication and teamwork in patient care: How much can we learn from aviation? *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 35,* 538-546. Reprinted with permission from Blackwell Scientific Publishing.

Abstract

Objective: To identify evidence on the role of assertiveness and teamwork and the application of aviation industry techniques to improve patient safety for inpatient obstetric care.

Data Sources: Studies limited to research with humans in English language retrieved from CINAHL, PubMed, Social Science Abstracts, and Social Sciences Citation Index, and references from reviewed articles.

Study Selection: A total of 13 studies were reviewed, including 5 studies of teamwork, communication, and safety attitudes in aviation; 2 studies comparing these factors in aviation and health care; and 6 studies of assertive behavior and decision-making by nurses. Studies lacking methodological rigor or focusing on medication errors and deviant behavior were excluded.

Data Synthesis: Pilot attitudes regarding interpersonal interaction on the flight deck predicted effective performance and were amenable to behavior-based training to improve team performance. Nursing knowledge was inconsistently accessed in decision-making. Findings regarding nurse assertiveness were mixed.

Conclusions: Adaptation of training concepts and safety methods from other fields will have limited impact on perinatal safety without an examination of the contextual experiences of nurses and other health care providers in working to prevent patient harm.

Keywords: Assertiveness – Communication – Patient safety – Perinatal safety – Safety attitudes – Teamwork.

Callouts

Health care providers must promote safety by actively seeking potential sources of harm and deflecting them from the patient.

Nurses' knowledge was subjugated to medical knowledge, inconsistently accessed during decision-making, and legitimated through reference to policy and procedure rather than data.

Future research should document the effectiveness of team training interventions in promoting effective communication and coordination in dynamic patient care situations.

High-risk domains are those in which error and accident have potentially catastrophic consequences (Gaba, 2000; Knox, 2003; Rochlin, 1999). Healthcare organizations are high-risk domains by virtue of their increasing patient acuity, technical complexity, and fundamental dependence on human beings to execute care (Institute of Medicine [IOM], 2004). Communication problems are consistently identified as a leading cause of system breakdown in patient care (IOM, 2000, 2001, 2004; Simpson & Knox, 2003). Likewise, the July 2004 Joint Commission on Accreditation of Healthcare Organizations (JCAHO) *Sentinel Event Alert* highlighted the significant contribution of communication problems to potentially preventable perinatal morbidity and mortality (JCAHO, 2004).

In other high-risk domains (such as aviation and nuclear operations), safe operations are characterized by a collective sense of agency for maintaining safety and a mutual understanding that all team members will state their observations, opinions, and recommendations, and actively solicit and consider input from other team members (Knox, 2003; Rochlin, 1999; Simpson & Knox, 2003). In healthcare, however, fundamental and longstanding problems with interprofessional relationships have been well documented (Espin & Lingard, 2001; Iacono, 2003; Thomas, Sexton, & Helmreich, 2003; West, 2000; Zwarenstein & Bryant, 2004).

The major thrust of the patient safety movement has been toward replacing the focus on individual culpability for error ("blame and shame" culture) with a systematic search for, and elimination of, the organizational problems that allow human errors to result in patient harm (IOM, 2000, 2001, 2004; Simpson & Knox, 2003; West, 2000). However, Rochlin (1999) proposed that a singled-minded focus on neutralizing error and

risk interferes with the maintenance of safe operations by obscuring the effect and importance of individual and collective action. Safety is more appropriately conceptualized as a social construct of *collective agency* that is essential to understanding and managing evolving, and frequently unpredictable, threats. Knox (2003) and Henneman and Gawlinski (2004) conceptualized safety as a *dynamic process* in which the role of health care providers is to *create safety* by actively seeking potential sources of harm and deflecting them from the patient.

In the inpatient obstetric setting, this active role of identifying and deflecting the slips, trips, lapses, organizational problems, and latent system failures that will inevitably place the patient in harm's way (Gaba 2000, West 2000), falls disproportionately on the nurse as the primary gatekeeper of observations, interventions, treatments, and often the management of labor (IOM 2004, James, Simpson, & Knox, 2003). However, in their review of patient safety, human factors, and adverse obstetric events, Simpson and Knox (2003) identified the following repetitive themes in near-misses and injuries: "Concern was expressed, but not directly. The problem was stated, often not clearly. A proposed action didn't happen. A decision was not reached or acted upon." (p. 243) and identified assertive communication as "the key to maintaining safe operations," (p.234) in the high-risk domain of inpatient maternity care.

Several recent studies have documented what Gaba, Singer, Sinaiko, Bowen, and Ciavarelli (2003) described as "problematic" attitudes toward safety practices and teamwork in health care environments. Sexton, Thomas, and Helmreich (2000) noted that research is needed to better understand health care provider attitudes that may be amenable to intervention, as work in aviation psychology has demonstrated that attitudes

regarding stress, hierarchy, teamwork, and error are not only predictive of safe performance in high-risk conditions but also sensitive to intervention via targeted training. The purpose of this review is to identify knowledge gaps, what is known, and opportunities for research regarding the role of assertion and teamwork and the application of aviation training techniques to improving patient safety in inpatient obstetric care.

The Problem: What is Known about the Presence and Effects of Assertiveness in Teams?

Theories of organizational safety have been applied to healthcare environments (Gaba, 2000). Normal accident theory (NAT) focuses on the complexity and "tight coupling" of system components as sources of accidents. From a NAT perspective, accidents are inevitable, because the root causes of accidents can be traced to latent properties of the organizational system which, when triggered, result in a cascade of events which is not always caught by the system's technical or procedural defenses; and in fact the addition of new defenses into the system may increase risk by increasing system complexity (Gaba). Application of Human Factors Theory has demonstrated that communication patterns, team function, workload, and coping mechanisms affect both individual and group ability to identify evolving problems and make appropriate management decisions in complex decision-making situations (Carthey, de Leval, & Reason, 2001; Helmreich, Foushee, Benson, & Russini, 1986; Schaefer, Helmreich, & Scheidegger, 1995).

Highly reliable organizations manage the tendency toward accidents through collective agency for identifying and managing continuously evolving threats. That is, all operators are charged with scanning continuously for threats, and for speaking up when

they identify potential threats, regardless of their status in the hierarchy or their defined role on the work team. This collective sense of agency is generated by the intensity of operations, identification and elimination of underperformance, and disciplined practice in managing, planning, anticipation, communication, and teamwork (Gaba, 2000; Rochlin 1999; Weick, 2002).

When high reliability, normal accident, and human factors theories were applied to practical experience in aviation and other high-risk domains, assertiveness was identified as a key skill for creating patient safety and effective teamwork in the obstetric environment (Knox, 2003; Leonard, Graham, & Bonacum, 2004; Simpson & Knox, 2003). However, importing concepts and methods from other fields without understanding the experiences of nurses in the context of healthcare teams is not likely to overcome long-standing interprofessional conflict. Understanding nurses' perceptions of their own use of assertiveness and the factors that facilitate or constrain their effectiveness or their sense of agency is therefore a critical component of building and maintaining safe patient-care systems.

Assertiveness occurs when "an individual provider asserts their opinion [through questions or statements of opinion] during critical times" (Thomas, Sexton, & Helmreich, 2004), or "individuals speak up and state their information with appropriate persistence until there is a clear resolution" (Preston, 2003).

Review of the Literature

A literature search was conducted of PubMed, CINAHL, Social Science Abstracts, and the Social Sciences Citation Index. The search was limited to English language and human studies using the terms "patient safety," "medical error,"

"interprofessional relations," "physician-nurse relationships," "communication," "safety," "obstetrics," "assertion," and "adverse events," "teamwork climate," "teamwork and medicine," "medical error and team communication," "human factors," and "situation awareness." Titles and abstracts of 285 articles were screened for relevance to the research question, and additional references were identified from the reference lists of selected articles. Research articles from peer reviewed journals and book chapters were considered for inclusion. The majority of the literature on medical error was focused specifically on medication error, and these studies were excluded from the review, as were editorials and opinion pieces.

From the initial screening, 42 articles were selected for further evaluation of methodological quality and applicability to the question. No additional relevant citations were identified. Five aviation studies regarding safety attitudes, teamwork, and communication management were included in the review, as well as two studies comparing the safety attitudes of medical and aviation personnel and two studies of medical teamwork attitudes.

An additional search of PubMed using the search terms "assertive behavior" and limited to English language and human studies was done. The literature in this area was focused on deviant and/or criminal behavior and was therefore excluded from review. Finally, a search of PubMed using the medical subject headings "assertive behavior" and "nurse" retrieved 180 citations, 171 of which were opinion pieces. Three were excluded for inadequate methodology, leaving four studies of nurse assertiveness and two studies of nurse decision-making for review.

Critique of Selected Studies

Human Factors in Aviation Safety. Much of the interest in communication in health care has been generated through application of concepts from the aviation industry safety model of crew resource management (CRM) to the health care setting. The CRM movement grew out of recognition that human (rather than weather or equipment) factors were responsible for the majority of accidents and incidents in aviation (Helmreich, 2000). Aviation psychology researchers demonstrated that pilots' attitudes affected performance and were amenable to modification through specifically structured team training (Helmreich & Foushee, 1993; Helmreich et al., 1986; Stout, Salas, & Fowlkes, 1997).

In the late 1970's, the aviation industry began to recognize the need to attend to issues of leadership, command, communications, and decision making in the cockpit in order to improve safety performance (Lauber, 1993). NASA investigators developed an attitudes survey from interviews with pilots and retrospective reviews of accident and incident data and began collecting attitude data on a large group of pilots. In 1986, in a study comparing pilots' survey data with ratings of pilot flying performance conducted by check airmen, Helmreich et al. (1986) demonstrated an empirical link between pilot performance and pilot attitudes regarding the effects of fatigue, stress, and team function on their decision-making ability. Investigators performed a discriminant analysis of 18 self-reported cockpit management attitudes and found that 15 of the attitude statements were strongly predictive of pilot effectiveness.

Pilots who recognized that fatigue, stress, and poor communication were detrimental to performance in the cockpit and who valued fostering inquiry and

communication were rated more effective by the check airmen. Less effective pilots displayed attitudes described as “macho” or “right stuff,” indicating limited awareness of their personal and decision-making limitations. Although this study was small, it was the first to correlate psychometric testing of nonpersonality traits with pilot performance and was the foundational study for subsequent work in aviation and medical safety attitudes measurement. Of note, no demographic information was included in the report, and there were probably a limited number of women and minorities in the sample.

Once human factors were established as important performance variables in aviation, the industry became interested in issues of situation awareness, communication, shared mental models in decision-making, and whether training targeting these issues could improve aircrew safety profiles. Bowers, Jentsch, Salas, and Braun (1998) looked at communication styles in high- and low-performing teams and noted that high-performing teams engaged in more planning statements, asked more questions, and repeated commands more frequently than low performing teams. Likewise, Stout, Cannon-Bowers, Salas, and Milanovich (1999) found that effective teams engaged in advance planning, which was correlated with the development of shared mental models of the situation and engaged in more efficient communication in high-workload conditions. Stout et al. (1997) also examined the effect of targeted training on team performance, and they demonstrated significant positive changes in attitudes, knowledge, and coordinated performance in the flight simulator after completion of didactic training on communication, assertiveness, and situation awareness.

This group of studies provides continued support for the emphasis on questioning and assertiveness that has been central to CRM training over the past 25 years. It is

important to note, however, that these were all simulation studies, and the population from which the samples were drawn from was remarkably homogeneous male undergraduate students (Stout et al., 1999), male undergraduate aviators (Bowers et al., 1998; Stout et al., 1997), and military aviators (Bowers et al.). The generalizability of findings is also limited by self-selection bias and small sample sizes.

In a retrospective review of civilian incident report data from actual flights, Jentsch, Barnett, Bowers, and Salas (1999) found that when the captain (rather than the first officer) was flying the plane, more errors went unchallenged and individual and crew situation awareness was lost more frequently. Lack of assertiveness was a factor in 20% of cases in which the first officer was not effective in correcting the captain's errors. This study particularly highlighted the high cognitive task load carried by the captain when he or she was both flying the plane and holding overall responsibility for strategic decision-making, an observation that may translate to the performance of health care team leaders in dynamic clinical environments.

Comparing Attitudes on Teamwork in Aviation and Health Care. In two studies of teamwork attitudes in health care, the University of Texas Human Factors Group documented significant variation in perceptions of teamwork across types of care providers (Table 1). The researchers modified well-established surveys of core attitudes regarding teamwork, communication, hierarchy, error, and stress from aviation psychology studies to measure corresponding attitudes in health care providers. An operating room questionnaire was used to survey surgical and anesthetic attending physicians, nurses, and residents in four countries over a three-year period (Sexton et al., 2000). An intensive care unit questionnaire was used to survey physicians and nurses in 4

urban medical centers in the Houston area over a 2-year period (Thomas et al., 2003). Results from both cross-sectional studies indicated significant differences in attitudes about hierarchy and teamwork, with lower status providers (i.e., junior residents and nurses) more likely to report problems with communication and working relationships.

In a similar study, Gaba et al. (2003) compared safety climate indicators in medical personnel in 15 Northern California hospitals to that in naval aviators at the Naval Postgraduate School. They found a much higher rate of "problematic responses," (defined as responses indicating a lack of or antithetical to safety climate) in health care providers (nurses, physicians, and administrators) than in naval aviators. Of particular concern was that problematic response rates were even higher in the "high-hazard" hospital domains of emergency, operative, and intensive care.

All three of these studies were conducted by experts in applying human factors research to the healthcare environment. However, they also shared the limitations of having a relatively low response rate from health care providers, particularly physicians, and may have been affected by both self-selection and response bias.

Recognition of the commonalities between aviation and health care has led to numerous calls for adaptation of the CRM model to medicine (Hamman, 2004; Helmreich, 2000; IOM, 2001, 2004; Schaefer et al., 1995). However, the foundation of CRM was on understanding performance problems from the pilots' perspective (Helmreich & Foushee, 1993). While the three comparison studies documented a problem with safety and teamwork attitudes in hospitals, very few studies to date have explored the nature of teamwork or decision-making from the perspective of health care providers.

Influences on Teamwork in Health Care. Thomas, Sherwood, Mulhollem, Sexton, and Helmreich (2004) conducted a qualitative study of teamwork in the neonatal intensive-care unit. From their analysis of transcribed focus group data and field notes from a purposive sample of 36 neonatal intensive care providers, the concept of "team" was highly variable among providers. However, factors cited as influencing "working together" fell into three major categories: provider characteristics (personal attributes, reputation, and expertise), workplace factors (staffing, work organization, and work environment), and group influences (communication, relationships, and team).

Similarly, in a qualitative study of critical care nurse decision making, Bucknall (2003) identified three environmental influences on nurse decision making: patient situation, availability of resources, and interpersonal relationships (Table 2). In their ethnographic study of critical care, Manias and Street (2000, 2001) observed that nurses' knowledge was subjugated to medical knowledge, inconsistently accessed during decision making, and legitimated through reference to policy and procedure rather than experiential or scientific data.

While these studies satisfied general issues of qualitative rigor, participants may not have revealed full information in a focus group setting, and observations in the decision-making studies were fairly brief. These studies, like the attitudes and safety climate surveys, did not establish an empirical link between provider teamwork attitudes or interpersonal behaviors and patient outcomes.

Assertive Behavior in Nurses. Two studies of assertiveness in professional nurses had conflicting results. Gerry (1989) found that nurses in a small, semi-purposive sample drawn from a British hospital rated themselves more assertive outside of work than at

work and demonstrated a trend toward conflict avoidance. Tradition, training, and hierarchical structure of the work environment were barriers to assertive behavior, and knowledge, confidence, and their uniforms were facilitators. Kilkus (1993) found that nurses randomly sampled from the population of licensed nurses in Minnesota had mean scores in the moderately assertive range on the Rathus Assertiveness Scale, but nurses employed in hospitals had lower mean assertiveness scores than nurses working in outpatient settings, public health, and schools of nursing. Nurses working in administration, education, and mental health had the highest mean assertiveness scores. In a recent study, McCartan and Hargie (2004a, 2004b) found no correlation between sex-role orientation or caring skills and positive and negative assertive behaviors.

All of these studies have significant threats to validity, including self-selection bias, response bias on self-reported measures, and lack of power analysis. Some limited the construct of assertive behavior to refusal of an unreasonable request or accusation. No studies established an empirical link between assertive behavior and patient outcomes.

State of the Science & Directions for Research

When viewed together, high-reliability, normal accident, and human factors theories indicate that errors will continue to occur in the provision of medical care, and a single-minded focus on “system” level functions for preventing error may actually increase the potential for harm to occur (Knox, 2003; Rochlin, 1999; Weick, 2002), suggesting the need to improve medical teamwork and communication as a key strategy for preventing patient harm.

There is good evidence from the aviation industry that operator attitudes about teamwork, hierarchy, error, and stress affect performance in settings involving two or

more persons engaged in dynamic decision making (Bowers, et. al. 1998; Helmreich et. al., 1986). Planning and communication improve flight team performance (Bowers, et. al, 1998; Stout, et. al, 1999), and lack of assertiveness was demonstrated in 20% of cases in which captain errors went uncorrected (Jentsch et. al, 1999). Attitudes have also been shown to be amenable to targeted training interventions designed to improve the crew's ability to catch and recover from errors (Stout, et. al, 1997), but it is unclear how generalizable the results of simulation training are to actual duty performance, and these studies were conducted with highly homogeneous participant samples.

Evidence is growing that there are significant problems with safety and teamwork attitudes in healthcare environments (Gaba, et al., 2003; Sexton et. al., 2000; Thomas et al., 2003), and that nurses' contributions to decision making are undervalued and underutilized (Bucknell, 2003; Manias & Street 2000, 2001). There is conflicting evidence about the "actual" assertiveness of professional nurses. Importantly, the hypothesized links between safety attitudes, interpersonal behaviors, and patient outcomes have yet to be established.

By virtue of their continuous contact with patients and families as the primary bedside provider of care, perinatal nurses are uniquely positioned to see, evaluate, and act upon changes in the patient's condition. However, retrospective reviews of obstetric accidents demonstrate repeatedly that, at best, communication problems are a factor in the development of bad outcomes and, at worst, nurses' concerns are not stated clearly or are ignored (JCAHO, 2004; Simpson & Knox, 2003). There is substantial evidence that the relationship between nursing and medicine is troubled in many settings (IOM, 2004; Thomas et al., 2003; Zwarenstein & Bryant, 2004). If left unattended, the troubled nature

of nurse-physician relationships is likely to undermine the potential gains from team training in the medical arena.

The application of CRM principles to the healthcare environment is a promising concept, but the baseline data required for development of effective team training interventions has yet to be established (Thomas & Helmreich, 2002), and the transfer of CRM techniques across settings has been problematic even within the aviation industry (Helmreich, Merritt, & Wilhelm, 1999). There is also wide variation in providers' understanding of the meaning of "teamwork" and "collaboration" (Henneman, Lee, & Cohen, 1995; Manias & Street, 2000; Rosenstein, 2002; Thomas et al., 2003; Thomas, Sherwood, et al., 2004), and these concepts need to be clarified to enhance comparability of findings in future studies.

A challenge for health care providers in general and obstetric providers in particular is how to effectively measure patient safety. Traditionally, quality assurance has focused on using morbidity and mortality as quality indicators. Current practice is to combine morbidity and mortality data with benchmarking of certain positive indicators of quality, such as cesarean delivery rate or time to first dose of antibiotic. However, measuring patient safety is really measuring something that *doesn't* happen (errors, poor care, or bad outcome), which is much harder to conceptualize and make visible than negative outcomes (Schulman, 2002; Simpson, 2005). This is particularly true in perinatal care, where the generally healthy nature of the patient population makes mothers and their infants extremely resilient to even major physiologic insults. Focusing only on traditional quality indicators of morbidity and mortality in obstetrics results in under examination of threats to safety and quality (Simpson, 2005), and new measures

are needed. Links between provider attitudes, targeted interventions, and both old and new quality indicators have yet to be delineated.

Several areas of research require attention to enhance the patient safety profile for inpatient obstetric care. These areas include the problems that different types of providers experience in working to provide safe care and prevent patient harm, improving techniques for measuring the quality of care, and documenting the effectiveness of team training interventions in promoting effective communication and coordination in dynamic patient care situations. Only when we have examined these three issues with well-designed research will we have a secure platform for providing the safe care every childbearing family deserves.

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Table 1. *Studies of Health Care Safety Attitudes and Teamwork Climate*

Authors, Date	Sample Size	Sample Description	Measures and Analysis Approach	Results
Gaba et al. (2003)	6901 aviators, 2989 hospital personnel	Squadrons requesting CSAS and hospitals participating in patient safety consortium	Safety climate surveys: command Safety assessment & patient safety cultures in health care organizations; evaluated aggregate responses on 23 similar questions between the two populations	Average problematic responses: HC = 17.5%, NA = 5.6%; significant differences on all questions, with problematic responses up to 12 times greater among hospital workers; average problematic responses 20.9% in high-hazard areas (ED,OR, intensive-care unit)

Sexton, et al. (2000)	1033 Physicians and nurses, 30,000 pilots	Surgical and anesthesia attendings, residents, nurses in 13 hospitals	Cross-sectional surveys: operating room management attitudes questionnaire, intensive care management attitudes questionnaire, flight management attitudes questionnaire	60% of hospital staff v. 26% pilots denied effects of fatigue on performance, significant differences by discipline in ratings of teamwork quality; 1/3 of intensive-care unit respondents did not acknowledge they make errors; > 50% of medical respondents reported more team input needed in decision-making; 70% reported that errors not discussed
Thomas, et al. (2003)	320	Physicians and nurses in nonsurgical intensive care units, two teaching hospitals, four community hospitals	Descriptive cross-sectional survey: intensive care management attitudes questionnaire, factor analysis	Significant differences in RN versus MD ratings of MD-RN teamwork; RNs more likely to report difficulty speaking up, wanting more input in decision making, and that input is not well received

Thomas, et al. (2004)	36: 9 RNs 2 LVNs 2 UAP 23 MDs	Purposive sample of neonatal intensive care staff	Focus groups of both single provider type and mixed provider type groups. Field notes also taken, qualitative analysis	Three categories of influences on working together: provider characteristics - personal attributes, reputation, expertise; workplace factors - staffing, work organization, work environment; group influences - communication, relationships, team; Concept of "team" highly variable among participants
CSAS = Command Safety Assessment Survey; HC = Health care providers; NA = naval aviators; ED = emergency department; OR = operating room; LVN = licensed vocational nurses; UAP = unlicensed assistive personnel				

Table 2. *Studies of Nurse Decision Making and Assertiveness*.

Authors, Date	Sample Size	Sample Description	Measures and Analysis Approach	Results
Manias & Street (2000, 2001)	6: 2 managers, 2 CNS, 2 staff nurses	RNs from same critical care unit	Critical ethnography professional journaling, participant observation, interviews, focus groups	Differing value placed on policies & protocols: nurses used policy and protocol to legitimate their knowledge and to resist, MDs primarily relied on own knowledge and experience; nursing knowledge frequently subjugated to medical knowledge; nursing knowledge inconsistently accessed in decision-making; physician-nurse game was evident

Bucknall (2003)	18	Two critical care nurses from each category (staff nurse, CNS, associate charge nurse) in three hospitals.	Naturalistic observations and semi-structured interviews; each participant observed for 2 hr; semi-structured interview within 24 hr of observation; content analysis of transcribed text	3 categories of environmental influence: patient situation, availability of resources, interpersonal relationships; nature of problem determines type, speed, and complexity of decisions; resources directly affected autonomy, workload, and quality of care; more knowledgeable nurses expressed more comfort with collaboration; significant disharmony with junior medical staff.

McCartan & Hargie (2004a, 2004b)	94	Convenience sample of 92 nurses for psychometric; 50 randomly selected from this pool for behavioral testing	Report A: assertiveness inventory and caring assessment; Report B: self report measures of assertive behavior and sex-role orientation; behavioral measure of videotaped responses to audiotaped stimuli; correlational analyses	Report A: no correlation between positive assertion and caring skills, no significant correlation between negative assertion and caring skills, except in the component of accessible caring, negative assertion behavioral test correlated with accessible caring skills; Report B: no correlation between sex-role orientation and positive or negative assertion.

Kilkus (1993)	500	Random sample of active RN licensees in Minnesota, 64% response rate	Rathus assertiveness schedule, demographics; descriptive correlational analysis	Nurses over age 60 less assertive; no difference based on gender, entry level, or years of experience; inconsistent results for specialties.

Gerry (1989)	99: 33 nursing sisters, 33 staff nurses, 33 enrolled nurses	Semi-purposive convenience sample of British nurses; 6 nurses interviewed	34-item questionnaire with qualitative comments; six respondents willing to interview randomly selected ; 30 minute interviews were audiotaped.	Nurses reported they were assertive in wanting to know personal rights and were interested in constructive criticism, less likely to refuse unreasonable requests or ignore demands; tendency towards conflict avoidance but would be able to challenge a senior colleague in the patient's interest; less assertive at work than outside work but viewed assertion as important for communication and safety at work; facilitators uniform, confidence, knowledge; barriers tradition, training, hierarchical structure

Paper 3

Social and Environmental Conditions Creating Fluctuating Agency for Safety in Two Urban Academic Birth Centers

Audrey Lyndon

Abstract

Objective: To identify interpersonal, structural, and social processes affecting agency for safety among nurses, physicians, and certified nurse-midwives in two inpatient perinatal settings.

Design: Grounded theory.

Setting: Two urban academic perinatal units in the western United States.

Participants: Purposive sample of 12 registered nurses, 5 physicians, and 2 certified nurse-midwives (CNMs).

Findings: Agency for safety (the willingness to take a stand on an issue of concern) varied among all types of providers depending on the specific context of the clinical situation, and was strongly influenced by interpersonal relationships. While physicians and CNMs believed they valued nurses' contributions to care, the units had deeply embedded traditional hierarchies. Nurses felt they were structurally excluded from important sources of information exchange and from contributing to the plan of care. Pervasive and mutually reinforcing segregation of activities by discipline impeded information flow, challenging safety. Nurses' confidence in their clinical assessments was a key driver for asserting their concerns. Confidence could be undermined in novel or ambiguous situations and by poor interpersonal relationships, resulting in a process of *redefining the situation as a problem of self* and potential lack of persistence regarding their concerns. All disciplines engaged in conflict avoidance strategies in the service of maintaining harmonious relationships.

Conclusions: Women and their families should not be dependent on the interpersonal relationships of providers for their safety. Clinicians of all disciplines need to be aware of

the complex social pressures that can affect clinical decision-making. Continued context-specific research is needed to fully articulate facilitators and barriers to perinatal safety so that effective interventions may be designed and tested.

Background

Inpatient perinatal environments may be considered high-risk or high-hazard domains. Although adverse events are extremely rare, they can have catastrophic consequences when they occur (Gaba, 2000; Knox, 2003; Rochlin, 1999). Safety in the high-hazard domain of health care has recently been conceptualized as a dynamic state of collective agency for identifying emerging threats and deflecting them from reaching the patient (Henneman & Gawlinski, 2004; Knox, 2003; Lyndon, 2006). An organizational culture that fosters collective agency assures that all clinicians have individual and collective authority to question the plan of care and to "stop the line," (Knox) or change the direction of a clinical situation in the patient's best interest.

In most inpatient perinatal settings the responsibility for detecting and communicating these threats falls disproportionately on the nurse as the primary gatekeeper of real-time observations and management of a woman's labor (James, Simpson & Knox, 2003; Page, 2004). Assertive communication, defined as stating concerns with persistence until there is a clear resolution (Preston, 2003), has been identified as a key skill for maintaining safe operations in perinatal care, particularly among "junior" (i.e. lower status) personnel (Leonard, Graham & Bonacum, 2004; Simpson & Knox, 2003). However, evidence suggests nurses frequently recognize problems with patient management plans, but do not necessarily take assertive action to correct these problems (Cook, Hoas, Guttmannova & Joyner, 2004; Maxfield, Grenny, McMillan, Patterson & Switzer, 2005). Furthermore, when they do challenge the plan they may be ignored (Simpson & Knox).

As described in multiple high risk industries, safety improvements are garnered through developing a culture of collective agency for safety, in which all providers have responsibility for changing the direction of the plan when needed, and through improving communication and assertion skills among team members (Helmreich, 2000; Thomas & Helmreich, 2002; Weick, 2002; Weick & Sutcliffe, 2001). However, the interpersonal relationships, decision-making culture, and economic pressures and incentives influencing teamwork and decision-making are substantially different in perinatal care. In many settings nurses are employees of the hospital while the attendant physician and CNM providers are considered revenue-generating customers (Brown, 2005a, 2005b; Gaba, 2000; Knox & Simpson, 2004).

Enthusiasm has been high for the aviation model of crew resource management (CRM) as a potential avenue to improve safety through better teamwork and communication among health care providers by flattening hierarchies and improving assertiveness skills (Grogan et al., 2004; Helmreich, 2000; Leonard et al., 2004; Morey et al., 2002; Shapiro et al., 2004). However, clinical trials have not demonstrated an effect for teamwork training in perinatal units (Nielsen et al., 2007) and have had mixed results in other clinical areas (Morey et al.; Shapiro et al.). A potential explanation for the difficulty in establishing a strong empirical link between teamwork training and safety outcomes is that the CRM model was based on understanding challenges to performance *from the pilots' perspective* (Helmreich, Foushee, Benson, & Eussini, 1986). Very few studies have been published exploring health care providers' perspectives on the challenges they face in maintaining safe operations. The few studies that exist indicate a lack of consensus on the meaning of "teamwork" and "collaboration" (Thomas,

Sherwood, Mulhollem, Sexton, & Helmreich, 2004) and high levels of safety-threatening conflict avoidance (Cook et al., 2004; Maxfield et al., 2005; Smetzer & Cohen, 2005; Sutcliffe, Lewton & Rosenthal, 2004).

Evidence suggests that providers' agency for safety in health care settings is threatened by the continued influence of hierarchy, status, power, role conflict, sleep deprivation, and fatigue on provider behaviors and information flow (Cook et al., 2004; Hendey, Barth & Soliz, 2005; Landrigan et al., 2004; Maxfield et al., 2005; Rogers, Hwang, Scott, Aiken & Dinges, 2004; Smetzer & Cohen, 2005; Sutcliffe et al., 2004). Little is known about how perinatal nurses and other perinatal clinicians perceive and manage these threats in their efforts to maintain patient safety in dynamic environments. The purpose of this study was to develop a better understanding of interpersonal, structural, and social processes affecting individual and collective agency among perinatal nurses, physicians, and certified nurse-midwives in the inpatient setting.

Design/Methodology

This grounded theory study used constant comparison, dimensional analysis, and situational analysis. Data were collected between September 2005 and January 2007 using semi-structured, open-ended interviews and participant observation with a purposive sample of registered nurses (RNs), physicians (MDs), and certified nurse-midwives (CNMs) from two academic clinical settings. Individual interviews lasting 45-90 minutes were conducted with each participant in the setting of their choice. Interviews were recorded and professionally transcribed verbatim. Transcripts were cross-checked against the recordings for accuracy (Kvale, 1996). Fifty-two hours of participant observations were conducted across day, night, and weekend shifts by shadowing

participants while they conducted their usual clinical duties in both study settings. The researcher conducted observations with 10 of the 19 participants (7 RNs, 2 MDs, and one CNM). Extensive field notes were taken during observations. Field notes were transcribed as soon as possible following these sessions to maintain accuracy and detail in the transcripts (Hammersly & Atkinson, 1995; Spradley, 1979).

In accordance with grounded theory methods, participants were selected based their clinical experience and on the likelihood of being able to articulate the phenomenon of interest. Interview guides are provided in the appendix. The primary focus of the study was on registered nurses' agency for safety; however physicians and CNMs were also sampled to obtain a broader perspective on team function, interdisciplinary communication, and collective agency. Participant observation was included in the sampling plan to capture real-time data about communication patterns, work conditions, and teamwork. The extent of participant observation was guided by theoretical sampling.

Rigor was maintained through reflexivity, attention to interaction quality, and both data and analytic triangulation (Angen, 2002; Borbasi, Jackson & Wilkes, 2005; Clarke, 2005; Hall & Callery, 2001). I approached reflexivity using three techniques: journaling, memoing, and self-interview. I maintained a research journal for exploring personal and professional responses to engaging the study. I used memos to identify my experiential data as a perinatal clinician, differentiating it from and testing it against grounded field data. I had a colleague interview me using the study interview guide, to assist in understanding the influence of my own clinical experiences on data collection and analysis. I actively encouraged participants to "think out loud" during observations and to "walk me through" scenarios they presented during interviews in order to avoid

making assumptions about the meaning of events. I used mirroring and reflection to actively check interpretations and seek clarification during interviews and observations.

Data were managed with Atlas.ti 5.0-5.2 (Scientific Software Development GmbH, 2004). I maintained a detailed audit trail by dating entries and saving a new version of the file for each analytic session. I tested the integrity of the audit trail by back tracing a set of codes that had been clustered into a dimension, and was able to successfully reconstruct the decision process. I tested the quality of the conceptual development through peer assessment and member check.

Human subjects (ethics committee) review and approval was obtained from the University of California, San Francisco and participating institutions. Study procedures including measures for protection of identities and the risks, benefits, and alternatives to participation were described and discussed prior to requesting signed informed consent. Participants were reminded of their right to withdraw from the study at any time. At the end of each interview or observation, permission for possible future contact was requested. All participants agreed to potential follow-up contact for clarification of data, and 16 of the 19 agreed to potential contact for participant observation of their clinical practice. Participants were given a $15.00 gift card for each study session.

Data Analysis

Data were analyzed using the constant comparative method, dimensional, and situational analysis. Dimensional analysis (DA) was developed by Schatzman (1991) and described in further detail by Kools and colleagues (1996). Dimensionality is the process of recognizing complexity in a situation and using natural analytic processes to inquire into the parts, processes, context, and implications of the situation (Schatzman).

Schatzman described dimensional analysis as providing articulation of a systematic, structured approach to maintaining sustained engagement of both intuitive and systematic normative cognitive processes in the application of the core ideas and practices of grounded theory (Kools et al.; Schatzman).

Data were collected and analyzed in an ongoing simultaneous and iterative fashion, using the constant comparative method (Glaser & Strauss, 1967; Strauss, 1987) to develop open, focused, and theoretical codes (Charmaz, 2006). Open codes were used to describe the data as dimensions of experience without regard for how they appear as elements of Strauss' coding paradigm (structure, process, condition, or consequence) (Schatzman, 1991). Dimensions in DA are similar to categories in traditional grounded theory. Constant comparison was used to identify and sub-dimensionalize a "critical mass" of dimensions (Schatzman). Theoretical sampling was used to saturate dimensions by fully developing and differentiating their properties (Charmaz; Glaser & Strauss; Kools et al.; Schatzman; Strauss).

Once a critical mass of dimensions was identified, the explanatory power of the various dimensions for illuminating the central action, interaction, or processes was considered and the dimension with the greatest explanatory power was given the status of "perspective," or centrally important position (Kools et al., 1996). The remaining dimensions were then evaluated for their fit as context, conditions, process, or consequence, or discarded from the central framework. Situational analysis techniques (Clarke, 2005) were also used to illuminate the complexity of the situations under study.

Results

Study Settings

Participants were recruited from the birth centers of two urban teaching hospitals in the western United States. Their perinatal services ranged from 1200 –1800 annual births. Both were integrated perinatal units caring for antepartum, laboring, and postpartum women in one location with one set of staff in an academic care model. They offered a full range of perinatal services from midwifery to maternal-fetal medicine and had in-house obstetric and anesthesia services, and an intensive care nursery. Nurses were represented by unions. Both settings served medically and socially complex patient populations.

Participants

A purposive sample of nineteen providers participated in the study, including twelve RNs, two CNMs, and five MDs. Four MDs were perinatologists and one was a chief resident in obstetrics and gynecology. Volunteers were recruited via staff meetings and peer nomination. The study included 18 women and one man. Sampling was not predetermined based on gender, ethnicity, race, or other demographic characteristics. However, to increase diversity in sampling, demographic characteristics of potential participants were considered when feasible. Self-reported ethnicity was 74% Caucasian, 10% Hispanic, and 16% Asian/Pacific Islander. The age, experience, and number of years in practice in the specific setting are described in Table 1.

(Insert Table 1 here)

Key Findings

Advocacy as the source of nurses' agency for safety. The nurses in this study identified "being the patient's advocate" as the source of their agency for patient safety and central to their function as a registered nurse. They invoked the language of advocacy spontaneously in response to the question, "Tell me what keeping patients safe means to you," and they described "safety" as broadly encompassing protection of the integrity of the person entrusted to their care.

> *"You're being the patient's advocate. And you know, always…always realizing that the nurse is – your role is to be a safeguard – not just to execute their plan of care, but also to understand what's in the patient's best interest as well."- RN*

> "*I think that what I would say is that [safety] would be that a patient and her loved ones come through the hospital experience – the treatment, the procedures – as intact as possible physically, emotionally, psychologically, as much as possible." - RN*

However, the nurses also acknowledged that they were not always successful in implementing this advocate role. They presented multiple examples of situations in which they were not able to effectively challenge plans of care they considered either unsafe or inappropriate for the woman and her family. Physicians and CNMs also described situations in which they felt intimidated or decided to remain silent about clinical concerns.

Fluctuating agency for safety. The dimension with the greatest explanatory power for understanding the participant's sense of agency to maintain safety was *fluctuating agency.* Fluctuations in agency for safety were described by all types of providers. The clinicians' agency for safety, or ability to press their concerns with appropriate persistence until there was a clear resolution (Preston, 2003), varied across multiple

dimensions which facilitated and constrained efforts to maintain patient safety. The dimensions affecting agency will be discussed in relation to their roles as elements of context, conditions, process, and consequences, as presented in Figure 1.

(Insert Figure 1 here)

Context: The Situation in which the Phenomenon is Embedded

The clinical practice environment was characterized by inconsistency in availability of resources for meeting basic patient needs, strong segregation of professional activities by discipline, hierarchical social structures within and between disciplines, and a tendency for "safety" to be defined by clinicians (especially physicians and CNMs) as the absence of adverse outcomes.

Availability of resources. Working under a shortage of resources was a common participant concern.The subtle and pervasive influence of working under conditions of sub-optimal to frankly inadequate availability of resources was particularly evident during participant observations. Nurses were repeatedly interrupted from providing direct care to patients in order to hunt for basic care items that were missing from rooms and stock areas, re-set safety equipment that had not been properly prepared by previous staff, and spend time on the phone tracking down medications that had not been delivered or entered into the patient's electronic medication profile. Physicians, nurses, and midwives all had concerns about the availability and skill mix of nursing staff, and expressed frustration about continually dealing with organizations that did not seem to be responsive to the specific and unique needs of childbearing women and families.

> *"I'm tired of fighting the system. I have limited time left in my career"- MD*

> *"I feel like we're this entity that nobody really understands what happens on… So it's tough to justify our staffing needs to other units who don't understand that we may have 12 patients on the unit and that may require 8 nurses, even though we're not technically an ICU." -RN*

Segregation of professional activities. In both settings there was distinct demarcation of space, time, and action based on discipline. Nurses exchanged report at the change of shift in a group format followed by a more detailed one-to-one format. Physicians received separate "sign out" and then attended teaching rounds where patients were presented to the attending physician by residents. Plans were reviewed, updated, and validated at teaching rounds. Some attending MDs also conducted bedside antepartum rounds with residents. The level of participation and role of CNMs in teaching rounds varied by setting due to different models of midwifery care.

The spatial and time-related segregation of physicians in teaching rounds was a point of significant conflict for the nurses. The physicians and CNMs universally reported having good collegial relationships with RNs, and a belief that nurses would interrupt rounds when appropriate. In contrast, RNs reported a great deal of tension around the timing of rounds. It was their perception that the physicians were not open to being interrupted for pressing needs during rounds, and that nurses were structurally excluded from this important source of information exchange.

> *[Field note] The physicians are in the back room, presumably in rounds. I ask [the nurse] if, "on a normal day" the charge nurse would attend rounds. She says no, "At one point the MDs asked that nurses don't come in while they're having rounds. There's a huge war around that. We have rounds at 7 to 7:30, and even if we have a lot going on they are pushing us out. I think it would be good for the charge nurse to go, but when you just come on you have so many things to do: you have to pass out keys, and delegate, and go down and give report to the nursing office, so it just can't be done."*

The nursing staff particularly resented being "pushed out" of a room used by both disciplines for handoff communications, which was common in one setting, being ignored when they entered the "physicians' room" in the other setting, and not being acknowledged as a team member when they were able to attend teaching and bedside rounds or morbidity and mortality meetings.

The nurses knew important information was being exchanged in these sessions and decisions were made there, but felt they had no formal access to this information, lacked opportunities to contribute information to the decision-making process, and lacked administrative support for changing these patterns of segregation. Most importantly, they were frustrated by the lack of formal communication between disciplines regarding the plan of care.

> *"And the perfect example of that is Pitocin because docs may have this idea in their mind of why this person needs it and why they want to deliver them sooner as opposed to later and why they feel like it's warranted. But that is not communicated to the nurse caring for the patient. And we manage that medication." – RN*

The nurses also contributed to the ongoing segregation of information exchange in the sense that they normalized their inability to attend rounds in pointing to their competing duties such as checking charts, distributing keys, and reviewing medication orders at the beginning of the shift.

Hierarchy. The traditional hierarchical structure of medicine was evident in both settings. Hierarchy and distribution of power were issues of concern to all participants. Individual responses to hierarchy and strategies for coping with it varied. Some participants (physicians, nurses and CNMs) expressed concern with "breaking" the hierarchy and associated negative consequences for relationships when going over

another's head. Others simply acknowledged that traditional hierarchies continue to influence the interactions of various team members in their settings.

> *"I think that [residents] get talked to by Attendings for letting nurses have too much control. And so then I think it becomes this thing of "'Cause I said so, and I want to do it my way." And whether or not you have a good idea, if it looks like it's your idea, I've come up against that a lot more often." – RN*

> *"I think that…a nurse saying to a physician, "This isn't right" or "this is a problem-this isn't safe" is dependent on the nurse's personality, the doc's personality and the sort of hierarchical culture of the institution" - MD*

A specific property of hierarchical relations in these settings was the particular privilege given to teaching. It was clear to all that *the* major priority was the teaching opportunities available to residents, and at times this focus trumped even patient interests. For example, RNs generally did not do vaginal exams because this activity is reserved for residents. This deference to the learning needs of residents sometimes meant that women were not examined in a timely manner, or that critical pelvic examination findings were missed.

> *[She'd been pushing for a couple of hours when I came on] So when I went in and checked her, first of all my fingers hit the prominence of the sacral bone. You know, the coccyx was up like a fish hook. And then I went to the side with my fingers to 3 o'clock and 9 o'clock and I quickly encountered the spinal prominences. And then at the top the arch was extremely narrow. And of course the baby was way behind up there, -2, -1, whatever they were calling it. There was no way the baby was coming out of that contracted pelvis. And yet there'd been more than one doctor in there examining her, like the resident and the chief had examined her. I said "This is ridiculous." - RN*

Another specific element of hierarchical relations was the privilege given to outcome data and research. Demonstrating facility with the latest research findings was a proven method of enhancing status:

> *"When it becomes a more complicated medical situation where even though you might have an expertise in it, there's that, "Well, who's got one up on the literature?" And that's what flies around here. You know, who can cite the study better than this other person. And who knows the numbers" – CNM*

The privilege given to outcome data was evident in individual discussions of problematic situations that did not result in fetal compromise:

> *"So being on the miso[prostol] unmonitored may or may not have made a difference at all. But- I don't know- this is one that was like bordering on unsafe. So ultimately this patient's outcome was great. There was no harm done." - MD,* describing a situation where a high risk patient received a high risk medication without being monitored due to lack of knowledge and poor communication.

In these types of situations, physicians in particular were likely to define the process of care as still being within a margin of safety, rather than as an unsafe and unacceptable situation in which clinicians and patient were fortunate to have avoided an adverse event. This held true at the departmental level, where routines were defined as safe when there was no linked outcome data to refute their safety.

> *"And then they said, "But we don't feel there's enough data about this." And it's like, "Well, we're not even looking at the right data. We don't even collect the right data. I mean, just forget the whole thing." – MD,* describing bringing a concern about some bad outcomes to the department.

> *"Even when we look at cases that have bad outcomes..., I never thought it was a patient safety issue, that there was miscommunication or anything like that. Certainly there can be a misinterpretation of data. But I don't really feel like it was a system safety issue that led to bad outcome necessarily." – MD,* describing the safety of care.

Conditions Facilitating, Blocking, or Shaping Central Action

Confidence was a strong driver of agency for safety. This dimension was particularly salient for RNs in the study. Their confidence in themselves and in their clinical grasp of the situation was very important in their judgments about when and how

to intervene, and a key driver for asserting concerns. Confidence was not a fixed property of an individual; it was fluid and dynamic, highly variable both within and across individuals.

> *"I might have – on my time on the night shift, been able to explore the possibility of a [cesarean] section…And I just was not confident enough at that time to –with myself - to do that."* - *RN,* about a compromised baby.

> *"It's a hard thing to do, but you just have to do it. I just - so what if they're upset? It doesn't really matter if they get pulled out of rounds. If they get pulled out of rounds and he's upset and the strip looks fine, well, that makes me feel good. Good, he's comfortable with the strip." -RN,* on insisting on a bedside evaluation from the Attending.

Confidence varied based on global factors and characteristics of the person (such as years of experience, or years in the setting), and based on specifics of the clinical situation and the environment in which the situation was occurring. Having the confidence to intervene varied with the nurse's experience, the quality of relationships between involved clinicians, the clarity or ambiguity of the situation, and the responses of others to the nurse's concern.

Experience as a sub-dimension of confidence. "Experience" held strong explanatory power for the nurses as a yardstick or proxy for their ability to intervene effectively when they had a concern. Experience was perceived by RNs as central to having agency in the situation. It was described as a sub-dimension of confidence, wherein more experience contributed to having more confidence, and the inability to intervene was ascribed to "the younger nurses" or "the newer people." This discourse was very powerful and linked the dimension of confidence with another facilitator of agency, positive relationships.

Quality of relationships. Knowing the other providers was a key facilitator of effective use of agency and communication for all participants. Good relationships were considered essential for effective teamwork in emergent situations, and knowing who one was dealing with allowed a clinician to anticipate how the other person might respond to their concerns. In most cases *knowing the colleague* was described as a facilitator in the context of a good relationship and level of trust with that person, and knowing how the person would respond:

> *"I think I have a good enough relationship with the doctors. I think that I've been here long enough that they know me and they trust what I'm saying. Compared to somebody who's maybe only been here a year or two and has just learned labor. I think you have to pay your dues. They trust what I'm saying, and they'll come back and take a look at the strip." –RN*

Knowing the colleague was also important for clinicians in effectively managing difficult relationships; they were then able to brace themselves for difficult interactions or had developed specific strategies for dealing with someone they knew was hard to get along with.

> *"There's this one nurse that moves so slowly that I really thought she was doing it on purpose to irritate me. But she moves so slowly with everyone, I just want to go up and shake her and just say…but I've learned that you can't- she won't respond to anything. And usually it isn't harmful what she's doing, but I have to really kind of meditate and just say, 'That's just who she is'" – MD*

> *"I don't shut down with her anymore, that [doctor], even in the OR. I can't think of any one thing that I might've done to change my reaction to her. But it has changed, and I think maybe I'm setting myself up or preparing myself for her being on that night. I have to act more confident, not let her get to me." – RN*

While knowing the colleague often helped an RN engage a clinical concern more effectively, the nurses also described many situations in which knowing who they were working with did not help them overcome significant hurdles in expressing or getting

action on their concerns. Knowing, or having a "good" relationship could be easily trumped by contextual factors such as hierarchy:

> *"I said,"There's thick mec. We need Peds here." And [the resident] said [to Peds staff], "Well, not for a few minutes. Just go ahead and go!" and I'm like,"No, don't go!"... So Peds said "Well we'll answer this call." I said "Please come back!" They didn't listen to me - they listened to the doc. And they know me, and they didn't even know the doc who was standing there with the football hold [catching the baby], that's who they were going to listen to." – RN,* describing an imminent birth requiring pediatric attendance.

Response to concerns. The nurses described being ignored, getting shot down, and being recipients of rude behaviors as part of the nature of everyday practice. They expressed a distressing degree of certainty about not being attended to when they had clinical concerns. When asked if they had ever been in a situation where they had difficulty getting a physician or CNM to respond to a concern, RNs said, "Many, many, many times," "It happens a lot," and "It's just the course of things." Thus while physicians and CNMs universally described themselves as open to, and expecting an RN's contributions to the plan of care, nurses often described being shut out of formal information exchange and not welcomed as contributors.

> *"You get to know your Attendings and your chiefs and what their ... [pause]... how collegiate (sic) they are with nurses and how open they are to listening. Some of them are very dismissive, some of them aren't. Some really want to hear from us, and some don't." - RN*

> *"Its way better than it was 30 years ago... But some of it's still there. You know?...They just think they're the kings and queens of the world and we nurses are just their servants and not worth interrupting them." – RN*

*Parallel Worlds.*The nurses' sense of being shut out and not attended to was exacerbated by the pervasive and mutually reinforcing segregation of professional activities in both settings. RNs described the outcome of this segregation as "being on

separate planets," and "living in a parallel world," in which they either did not know or did not agree with the MDs' specific plans for patients. They described multiple situations of "cross-counseling" patients, wherein nurses and physicians gave patients conflicting information regarding medications such as oxytocin, magnesium sulfate, and depo-provera. While this kind of disconnection presented problems for relationships by creating tension between physicians and nurses, another more serious consequence was the tendency for patients to get trapped in the resulting "chasm" between the two disciplines.

> *So [titrating the oxytocin] becomes this constant tug of war of "Turn it up" "No, it's fine" "Turn it up" "No, I don't want to. That's not the protocol" "Do this, do that" whatever. And I think if we had a conversation about it, I'm not saying that we would necessarily push it that much harder, but maybe we could all be on the same page…. And I don't think that happens enough. – RN*

Clarity v. Ambiguity. Clarity of the clinical situation was a powerful contributor to clinicians' confidence and sense of agency in the situation. Two factors influencing clarity were the degree to which nurses were able to bridge the "chasm" between disciplines and determine whether there was a clear plan for the patient, and the new perspective clinicians brought to situation awareness when they came in as a provider with a different take on the evolution of a situation. When the situation was very clear to the nurse, physician, or CNM, there was no hesitation in questioning the plan:

> *"Look" I said "You better get into that room…she's got a contracted pelvis. She's never going to deliver that baby. You need to call it." – RN*

> *"I went to the monitors at the front desk and I could hardly sit still. This was a fetal monitor strip with lates and no variability…And the fellow, who's new, wants to walk the patient back to the LDR…and I said, "No, she's going straight into the operating room." …I'm going to go in and take her to the OR." – MD*

However, when the situation was ambiguous or less straightforward, it was sometimes more difficult, particularly for the RN, to have the confidence to challenge the provider's plan of care with persistence. Novel situations created uncertainty, even in experienced nurses, and could temper the RN's forcefulness in expressing concern.

> *"I felt so frustrated about that [difference in patient counseling], so I talked to the chief resident, and I said you know, "Why the difference in this?" and she said, "Well they just really don't- they couldn't handle the baby, they wouldn't want it." And I said, "Well that seems kind of personal." [The chief said,] "Blah blah blah bye." Just, "I'm not going there with you [participant's name]" kind of thing. "Oh, okay." So just do my job..." – RN*

Processes: Actions Set in Motion by Conditions

The context and conditions described above resulted in several processes that are problematic for the development and maintenance of collective and individual agency for safety in the perinatal setting. These processes included *avoiding conflict* and its sub-dimension *working the hierarchy,* and *redefining the situation.*

Avoiding conflict. The high perceived importance of interpersonal relationships for effective team function under emergent conditions created an environment in which many participants described multiple ways in which they actively avoided conflict with colleagues in order to preserve relationships. This conflict avoidance was safety-threatening when it resulted in decreasing interactions with other providers, deciding not to mention problems to other providers, and withholding reporting of incidents for fear of damaging relationships.

> *"I felt like my rapport with the nurse was much more important to- to keep than writing an incident report on her*." *– CNM*

> *"Now, if I called [the nurse manager] on top of the charge nurse who really wasn't responding …that would have ramifications on the rest of my career here in terms of someone holding a grudge against me." – MD*

Physicians and CNMs were almost unanimous in their expressed desire to hear concerns from RNs or other clinicians presented in a clear and direct manner. Many RNs described routinely communicating in this way. However, nurses, physicians, and midwives also described various strategies they used when necessary for *working the hierarchy* in order to get what they believed was needed for safe patient care, without creating a conflict with a colleague. These included the use of suggestion, "sweet talk" and taking direct action without informing the other provider, as this RN related in response to a resident sending the pediatric team away right before a birth with thick meconium stained fluid:

> *"So [Peds] left, you know I did my thing, and looked at her [the resident], and I went over to the wall phone - boop boop boop - she didn't know who I was calling - and they came back in. So as far as she knew, they just came in on their own."*

Such strategies represent a threat to safety because they obscure the difference of opinion and reinforce the status quo. In this case the nurse effectively maintained safety for the patient, but because the resident was not privy to why the team showed up when they did, the resident "got away" with the behavior. The resident's "right" to decide which team members were needed for this birth and the RN's powerlessness in the situation were thereby normalized.

Redefining the Situation

Nurses were often able to take these difficulties in stride by simply ignoring power behaviors, waiting patiently for physicians or CNMs to acknowledge them, requesting their attention for an important conversation, or insisting on getting the rationale from the provider and having a discussion about the plan. However, novel

situations and the responses of others to concerns threatened RN agency by undermining confidence in their assessment of the situation, sometimes causing them to question their own judgment. Thus the RNs sometimes began *redefining the problematic clinical situation* as a *problem of self* rather than a problem of not being attended to appropriately.

First time situations: "I just didn't know…" In some cases the nurse's discomfort with a novel evolving clinical experience was redefined from being an inherent problem with what was happening to the patient into a problem of the RN's inexperience with the situation. This type of redefinition occurred when the nurse experienced "the brush-off" or lack of response from the physician or CNM regarding her concern. Two RNs were particularly insightful in illustrating how their years of experience were not powerful enough to help them resolve very difficult ethical dilemmas that arose in unfamiliar "first time" situations.

> *"I honestly thought - I didn't talk to anyone else about it - I just had talked to [the chief] and I kind of thought that it was my issue, because it was a termination. And I'm pro-choice and whatever. Abortion, and everything. But I thought, "Wow you know you really - that's a hard one." You know [pause] I just though this is how it was done." – RN*

> *"It was the most horrific thing I've ever seen…in my life [lets out air]. But I just didn't know that- I didn't know that I could say to the woman, if you tell them to stop, they have to stop.'" – RN*

Transforming "the brush-off" to "something I missed." In response to being brushed-off, nurses also sometimes doubted their own knowledge or judgment, or convinced themselves they must have missed some key piece of information that would change the clinical picture. This seemed especially likely to occur when physicians or midwives were particularly abrupt or rude.

> *"Well, I think its how they totally can shut you down…I mean, it was just so- the way that she spoke to us was just so rude and so abrupt. And I was*

> *pretty much shocked. I'm like, "Oh-" then you kind of start self-doubting. "Well, I don't know. Maybe they did treat her in the OR. They gave her some antibiotic" and, you know, then you start doubting yourself. "Oh, well, maybe there's something I missed." – RN*

Consequences

The use of assertive communication strategies and the persistence with which RNs and other clinicians pursued their concerns in this study were variable. The specifics of clinical situations (such as the clarity of the clinical problem, the quality of interpersonal relationships between clinicians and the responses of others to an expression of concern) often resulted in assertive communication of problems leading to a clear resolution. However, dimensions also came together in unpredictable ways, resulting in the interactional processes of redefining the situation, avoiding conflict, and working the hierarchy. Self-doubt also occurred when RN concerns were considered by a physician or CNM but the course of patient care did not change. Using the chain of command could be particularly problematic for nurses when their concerns were not validated by a change in the plan:

> *"I think if you go up the chain of command and the decision changes in your favor, then you feel like it's warranted. But if …it stays the same... then you don't feel validated in your choice to have gone up the chain of command. And you feel like you've ruined this relationship maybe with this doc…, you know, that you have friction now with this person because you went over their head." – RN*

These processes resulted in fluctuating agency or variation in the degree to which clinicians challenged problematic situations. Avoiding conflict and working the hierarchy undermined collective agency for safety by maintaining the status quo of the parallel universe and reinforcing segregation of professional activities. Patients were sometimes trapped in the resulting chasm between the

disciplines. These processes also tended to suppress reporting of safety issues or incidents, and resulted in missed opportunities for building relationships and trust through constructive conflict management.

Discussion

The differences between the physicians and CNMs and the nurses regarding perceptions of openness to RN input into the plan of care in this study are consistent with reported differences in perception of teamwork climate between types of clinicians in labor and delivery and other settings (Sexton et al., 2006; Thomas, Sexton, & Helmreich, 2003). Physicians in those studies had higher perceptions of the level of teamwork and RN participation in decision-making than did nurses. The findings of fluctuating agency for safety are also supported by Blatt, Christianson, Sutcliffe, and Rosenthal's (2006) findings that situational dynamics, including confidence and specific interpersonal relationships, influenced whether residents voiced or silenced their clinical concerns about patient care, and that speaking up and remaining silent are not single-point mutually exclusive choices but part of an ongoing dynamic relational process.

Assertive communication and collective agency for safety have been described as key to safe operations in the inpatient perinatal environment (Knox & Simpson, 2004; Lyndon, 2006; Simpson & Knox, 2003). While few data are available specifically related to the existence of collective agency for safety in perinatal care, evidence increasingly suggests that an environment of collective agency does not generally exist in healthcare settings (Cook et al., 2004; Gaba, Singer, Sinaiko, Bowen & Ciavarelli, 2003; Maxfield et al., 2005; Smetzer & Cohen, 2005; Sutcliffe et al., 2004). These findings identify some of the complex social and environmental processes that both facilitate and inhibit

individual and collective agency for safety in academic perinatal settings, which is an important step toward identifying strategies for increasing collective agency. Findings also illustrate that nurses, physicians, and CNMs are often quite successful in asserting their concerns in ways that result in strong advocacy for patient safety. However, the context, conditions, and processes contributing to fluctuating agency also fundamentally undermine reliability in providing safe care.

Clinical Implications. Women and their families should not be dependent on the relationships between providers for their safety. This study and Blatt, et al (2006) both highlight interpersonal relationships as driving safety and quality to a degree that has previously been under-recognized, especially when situations are ambiguous. This may be due to increasing pressure towards conformity of social relations in uncertain situations (Henricksen & Dayton, 2006). Clinicians of all disciplines should be aware of this pressure and concerned with developing reliable strategies for decreasing the influence of providers' interpersonal relationships on the processes and outcomes of providing care during labor and birth. Research is needed to further delineate facilitators and challenges to agency for safety at the individual, group, and organizational level, and to develop and test strategies under varied conditions.

The findings discussed here are local and specific to two urban academic hospitals with characteristics making them dissimilar to most U.S. settings providing perinatal care. However, many of the dimensions of the context and conditions described here (resource problems, hierarchy, segregation, variability in responses and relationships, etc.) can be expected to be present in other settings as well. Although the multiple layers of hierarchy in academic settings are not present in the community settings where most

perinatal nurses practice, all physicians are trained in the academic model of care. This can be expected to influence how they later interact with nurses in community settings. Nurses, physicians, certified nurse-midwives, and administrators would do well to examine their services closely for barriers and facilitators of collective agency for safety. Multiple studies have demonstrated that perspectives on safety and teamwork are quite different across disciplines. Therefore effective efforts to improve agency for safety will require engaging all participating disciplines in all phases of assessment, problem-solving, implementation, and evaluation.

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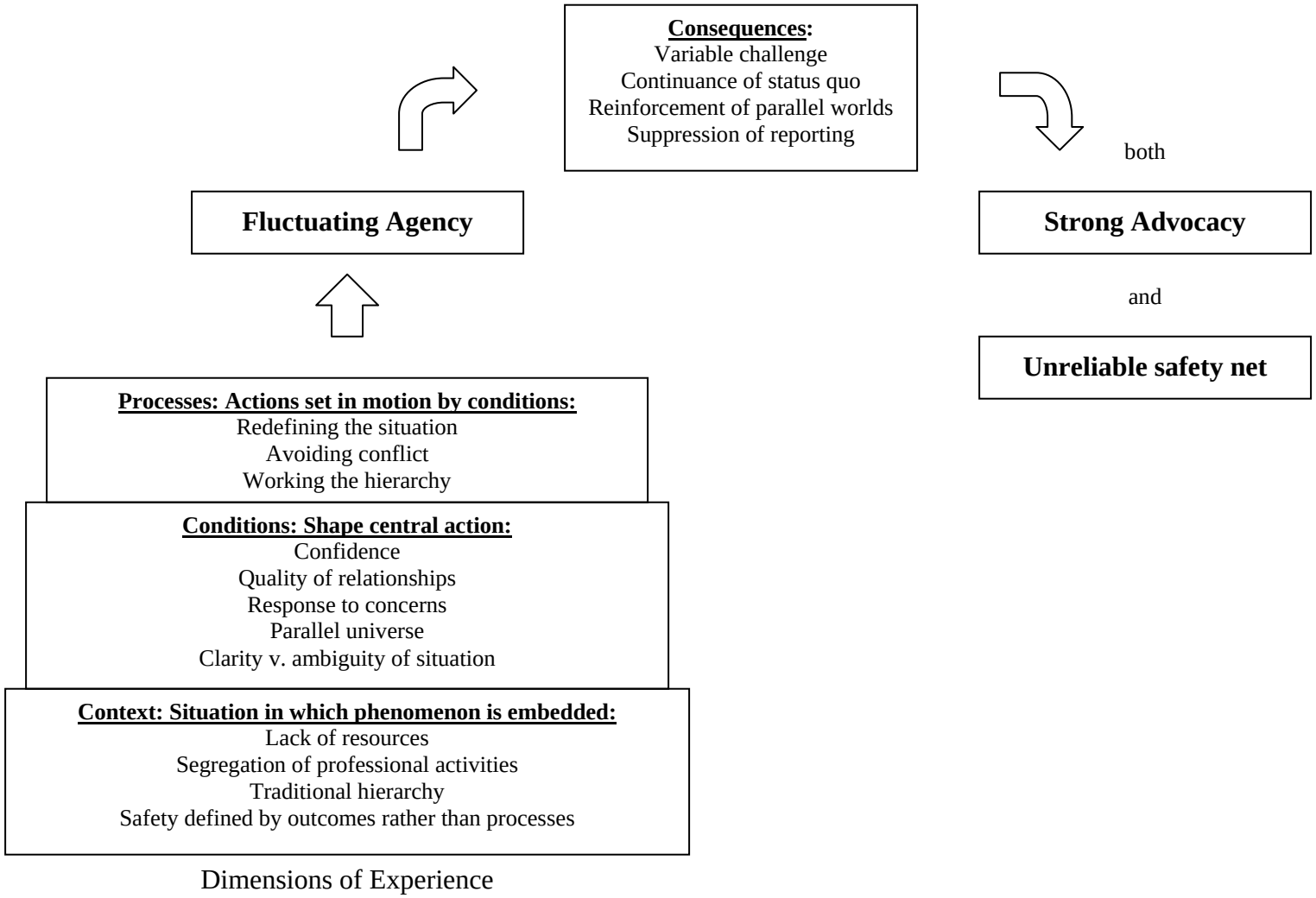
Table 1. Mean and range of age and experience level of participants by provider group.

Provider Type	Age	Years in OB	Years in Setting
RN (12)	42 (29 – 61)	10 (0.5 – 41)	10 (2 -20)
CNM (2)	55 (53 – 57)	25 (20 – 30)	2 (1.5 – 3)
MD (5)	49 (32 – 70)	21 (4 – 45)	13 (4 – 33)
All (19)	46 (29 – 70)	14 (0.5 – 45)	10 (1.5 – 33)

Figure 1. Perspective of fluctuating agency



Paper 4

Skillful Anticipation: Perinatal Nurses' Direct

Contributions to Providing Safe Care during Labor and Birth

Audrey Lyndon

Abstract

Objective: To describe the specific contributions of perinatal nurses to providing safe care during labor and birth in the inpatient setting.

Design: Grounded Theory

Setting: Two urban academic perinatal units in the western United States.

Participants: Purposive sample of 12 registered nurses working in the perinatal units at the time of data collection.

Findings: Nurses conceptualized safety broadly as protecting the physical, psychological, and emotional wellbeing of the woman and her family. Nurses maintained safety during labor and birth through *skillful anticipation* of the potential embedded in given clinical situations. This required integration of medical and technical knowledge and skill with intimate knowledge of the woman and the operational context of care to achieve accurate situation awareness and appropriate future planning. Conditions and processes promoting skillful anticipation included *being prepared*, *knowing*, and *envisioning the whole picture*. Lack of available resources, fatigue, and environmental distractions presented challenges to skillful anticipation, and thereby threaten patient safety.

Conclusions: Seemingly routine nursing tasks encompassed critical medical and technical knowledge work that nurses performed under highly stressful and distracting conditions. Perinatal nurses maintained safety by preparing themselves and the environment, anticipating problems before they occurred, and trapping errors before they reached the patient. Conditions and processes described in these settings may be common in perinatal care. Nurses need time and administrative support to successfully keep

patients safe. Further research is needed to expand knowledge of barriers to safety in perinatal care and to further describe the direct contributions nurses make to maintaining safe care.

Evidence is growing in support of the direct role of the nurse in maintaining patient safety. From a theoretical perspective, there are at least two key avenues for nurses to directly affect safety, including error trapping or error recovery, and surveillance. Nurses are in a particularly important position for trapping or recovering errors, meaning they are in an advantageous position for detecting and correcting error before it reaches the patient (Henneman & Gawlinski, 2004; Lyndon, 2006; Page, 2004; Rothschild et al., 2006). Surveillance, the ongoing monitoring and interpretation of a patient's condition, is also believed to explain nurses' direct role in maintaining safety by allowing for the early detection of clinical issues requiring intervention (Clarke & Aiken, 2003; Page, 2004). However, while evidence supports an effect for nursing on patient safety, little is known specifically about how this effect occurs, and more data are needed on how the nurse's direct role in maintaining safety is executed in various clinical environments. The purpose of this study was to specifically examine the direct contributions of perinatal nurses to maintaining safety in hospital birth settings.

Review of the Literature

Investigators have demonstrated associations between nurse staffing, nurse education, and patient outcomes in hospitals in the US and UK (Aiken, Clarke & Cheung, 2003; Aiken, Clarke, Sloane, Sochalski & Silber, 2002; Rafferty et al., 2007), and between long nurse work hours and increased incidence of error (Rogers, Hwang & Scott, 2004; Rogers, Hwang, Scott, Aiken & Dinges, 2004; Scott, Rogers & Hwang, 2006). In a recent meta-analysis of relationships between nurse staffing and patient outcomes, Kane and colleagues (2007) found evidence for an association between higher nurse staffing and decreased patient mortality, failure to rescue, and other adverse

outcomes, but also emphasized that no causal relationships have been demonstrated by this body of work. While a number of studies have incidentally noted nurses' contributions to preventing and correcting patient harm, only two published studies were identified with specific aims of investigating how nurses make care safer. No published studies were identified addressing this in the perinatal environment.

Henneman, Blank, Gawlinksi and Henneman (2006) investigated the mechanisms used by emergency department (ED) nurses to recover errors in a descriptive study using qualitative content analysis of focus group data with 20 nurses from an academic ED. The nurses in this study described their safety role as that of "firewall," "buffer," and "protector," and the investigators identified 15 strategies used by ED nurses for identifying, interrupting, and correcting errors. Nurses described interrupting errors committed by providers at all levels, including students, residents, physicians' assistants, attending physicians, other nurses and themselves. Rothschild et al. (2006) conducted a prospective observational study to assess the incidence and types of errors recovered by critical care nurses in a 10-bed academic coronary care unit. In 150 hours of direct observation of seven RNs during patient care, the investigators identified 142 recovered errors. Seventy-three percent of recovered errors involved medication administration, and 51% were potentially severe or life-threatening. The investigators estimated more than two potentially harmful errors are recovered per patient per day by critical care nurses.

These two studies provide beginning documentation of the nurse's active role in maintaining safety at the bedside, but despite the increasing international interest in patient safety and the identification of the nurse's central role in maintaining safe care, there are minimal data on the nurse's contributions to safety generally or to the safety of

perinatal care specifically. This grounded theory study was designed to illuminate the daily contributions of perinatal nurses to maintaining safe care during labor and birth in the hospital setting.

Design & Methods

Data were collected between September 2005 and November 2006 using open-ended semi-structured interviews and participant observation with a purposive sample of 12 perinatal registered nurses. The sample and results reported here are a subset of a larger study on collective agency for safety in perinatal care (Lyndon, 2007). Individual interviews lasted 60-90 minutes and were conducted with each participant. Interviews were recorded, professionally transcribed verbatim, and checked against the recordings for accuracy (Kvale, 1996). Forty-four hours of participant observation consisted of shadowing both staff and charge nurses in the course of their regular employment. A clinical nurse specialist was also observed. Observations were conducted across all shifts with 7 participants in two clinical settings. Field notes were taken during observations, and complete notes transcribed as soon as possible to maintain accuracy and detail in transcripts (Hammersly & Atkinson, 1995; Spradley, 1979).

Participants were selected based on their clinical experience and likelihood of being able to articulate the phenomenon of interest (Strauss, 1987). Nurses were recruited through presentations at staff meetings and by peer nomination. Participant observation was initially included in the design to capture real-time data about the nurses' work and provide a complement to the retrospective nature of interview data. Observations were subsequently guided by theoretical sampling. Rigor was maintained through reflexivity,

attention to interaction quality, data and analytic triangulation, and use of a detailed audit trail as previously described (Lyndon, 2007).

Ethics committee review and approval was obtained from participating institutions and the University of California, San Francisco. Study procedures, protection of participant identity, and the risks, benefits, and alternatives to participation were described and discussed with each participant prior to requesting signed informed consent at the initial interview. At the end of each interview or observation permission was requested for possible future contact. All participants agreed to potential follow-up contact for clarification of data. Ten of the twelve agreed to potential contact for participant observation of their clinical practice.

Data Analysis

Data were collected and analyzed in an ongoing simultaneous and iterative fashion using the constant comparative method as well as dimensional and situational analysis. Dimensional analysis is a specific approach to the core ideas and practices of grounded theory described by Schatzman (1991) and elaborated by Kools and colleagues (1996). As described previously (Lyndon, 2007), the constant comparative method (Glaser & Strauss, 1967; Strauss, 1987) was used to develop open, focused, and theoretical codes (Charmaz, 2006) to identify and sub-dimensionalize a "critical mass" of dimensions (Schatzman) which were saturated through theoretical sampling to develop and differentiate their properties (Charmaz; Glaser & Strauss; Kools et al.; Schatzman; Strauss).

The dimension with the greatest power to explain how perinatal nurses contribute to safety during labor and birth was then given the status of "perspective," or central

position in the explanatory matrix (a framework for illuminating central action), and the remaining dimensions evaluated for their fit as context, conditions, process, or consequences (Kools et al., 1996). Context is the set of dimensions representing the situation or environment in which the phenomenon is embedded. Conditions are dimensions that facilitate, block, or otherwise shape the central actions, interactions, or processes. Processes are the actions (intended or unintended) created or set in motion by the salient conditions, and consequences are the outcomes of these processes (Kools et al., 1996; Schatzman, 1991). Situational analysis techniques (Clarke, 2005) were also used. Data were managed with Atlas.ti 5.0-5.2 (Scientific Software Development GmbH, 2004).

Results

Study Settings

Nurses were recruited from the perinatal units of two urban teaching hospitals in the western United States. These two settings were relatively unique in size, organization of services, complexity of patient populations, professional union representation of staff, and number and type of providers on the care team. Both perinatal services were small, with 1200-1800 annual births. Services were integrated, with staff caring for medically and socially complex populations of antepartum, laboring, and postpartum women in one unit. Both settings offered a full range of services from midwifery to maternal-fetal medicine, and had in-house obstetric and anesthesia services, and an intensive care nursery.

Participants

A purposive sample of twelve registered nurses working in the units at the time of data collection participated in the study. Sampling was not predetermined based on demographic characteristics. However, demographic characteristics of potential participants were considered when feasible and non-white participants were preferentially recruited when possible to increase the diversity of the sample. All RN participants were women. The mean age was 42.7 years (range 29 – 61). Self-reported ethnicity was 75% Caucasian, 17% Hispanic, and 8% Asian-Pacific Islander. The nurses had worked in labor and delivery for a mean of 9.5 years (range 0.5 – 41), and in their current job for a mean of 7.1 years (range 2 – 15).

Findings

All of the nurses were asked to respond to the question, "What does 'keeping patients safe' mean to you?" and responses indicated a broad conceptualization of safety. The nurses quickly established *preventing harm* as a primary dimension of keeping patients safe. This concept was larger than just preventing errors. The nurses described preventing harm holistically as protecting the woman and her family in a physical, emotional, and psychological sense. A woman was kept safe when she experienced *coming through the birth process intact.* This did not necessarily mean that the woman's birth met all her expectations. It did mean that she had the information and time she needed to make her own decisions, her physical and emotional needs were met, and she and her family members were treated with respect and consideration. The dimension *skillful anticipation* had the greatest power to explain the work perinatal nurses engaged in to prevent harm and promote coming through the experience intact.

Skillful Anticipation

Skillful anticipation was the active and accurate consideration of the potentialities embedded in the clinical situation. It was a manifestation of accurate situation awareness and appropriate future planning. Skillful anticipation therefore required integration of experience, medical and technical know-how, and intimate knowledge of both the individual woman and the operational context of her care. Participants used *being prepared, knowing,* and *envisioning the whole picture,* as illustrated in Figure 1 to develop a projected future state for women that allowed them to anticipate needs and predict outcomes of care in a sophisticated way.

(Insert Figure 1 here)

Skillful anticipation involved grasping the current situation as well as active consideration of the questions, what can or will happen or evolve in the future under this particular set of clinical conditions? What is necessary to prepare for the potentialities of the situation, and to support the desired physiologic, psychologic, and emotional outcomes for this family's birth process?

> *[Field note] [The RN] reiterates her concerns to me: the patient is dry, and may also be complete but [the nurse] does not want to rush the birth - rather she wants to prepare for the birth by allowing enough time to get the second dose of antibiotics on board [to prevent a neonatal infection] and to correct the woman's hydration status. In this RN's experience, dehydration is a significant risk factor for uterine atony and postpartum hemorrhage.*

Skillful anticipation was important because it allowed the nurse to make independent preparations for the patient's safety. Nurses often did this before other providers recognized the urgency of the situation.

> *"And I had her on [the fetal heart monitor] for maybe a minute, a minute and a half when I saw that ["flat" tracing with late decelerations*

> *in a preterm but viable fetus with no fetal movement in days]. And I alerted the doctors, who kind of pooh-poohed me and didn't come in there as fast as I wanted them to… and I just threw in an IV and then drew the bloods and got her ready…and did everything that I knew that I needed to be preliminary before we could even get into the OR [for a cesarean birth]."*

The dimensions contributing to skillful anticipation are presented in Table 1 in the context of the explanatory matrix in which *skillful anticipation* has the status of "perspective," the dimension which best illuminates the central action, interaction, or processes (Kools et al., 1996). The dimensions will be discussed in relation to how they facilitate or challenge skillful anticipation.

(Insert Table 1 here)

Conditions and Processes Promoting Skillful Anticipation: Being Prepared, Knowing, and Envisioning the Whole Picture

Being prepared. The birth process is very dynamic. The nurses described two key types of preparations necessary for optimum performance and safety: *preparing self* and *preparing the environment.* Both types of preparation were required to maintain a state of readiness for birth:

> *"The clock is ticking in labor & delivery more than anywhere else…You never know what's going to change…So it can change just like that. You almost have to be in readiness mode most of the time when you're on shift, even though it might not appear to be like that.*"

> *"Just being prepared, being sharp, getting a good night's sleep the night before – just being all that you can be when you're at work – being ready to be everything that you can be for the patient."*

Birth is a natural process, and most births occur without need for specific intervention to maintain safety for the mother and her baby. However, the birth process also has great potential for things to go wrong. For example, a mother without risk factors

may hemorrhage rapidly after birth, or a baby may not breathe spontaneously. Due to the speed with which intervention may be necessary when things go awry, advance preparations always need to be made. There is not enough time to look for things or collect supplies when an emergency cesarean birth is needed or a baby is born requiring respiratory support.

The nurses spent significant time, energy, and thought *preparing the environment,* and considered this an essential activity for maintaining safety. Preparing the environment entailed arranging the room to their satisfaction and organizing the many supplies needed for birth. Arranging the room meant ensuring that the bed could quickly be removed to transport the woman to the operating room: untangling lines (monitor cables, IV lines, and phone cords) so the bed could be easily moved without dislodging an IV; moving furniture to maintain a clear path to the door; and assessing the position of family members in a manner that promoted their participation but also allowed the nurse a sense that the environment was controlled or controllable.

> *"When I walk into the room when I first take care of a patient, one of the first things I do is I untangle all my lines because inevitably I come in and the toco, IFM, all that stuff is tangled up with the blood pressure cuff and the phone line and all that. I untangle all of that and I make sure there's always a clear direct route to the door so if I have to get out of there I don't have all this stuff tangled up around each other. I'm looking around, making sure – I know that my emergency equipment is set up and ready to go there. I look to see where people kind of have situated themselves in the room too, so I know if I need to get out…if I've got people in the way, I kind of know where they are."*

The nurses also demonstrated how important it was to organize supplies by sorting and positioning them so they would be ready for immediate use with enough, but not too many supplies at hand. The nurses checked all of the emergency equipment in detail to

make sure it was functioning correctly. Observations recorded in the following field note were typical of all the nurses I observed caring for laboring women.

> *[Field note] She checks the Jackson-reese ambubag set up [for the mother] and shows me how the holes on the valve are set too far open for a fast inflation. She adjusts the bag the way she likes it so it will fill quickly and "you're not wondering what's going on and fiddling with it when you need to use it." She checks the suction regulator, and sets the continuous suction to 100 mm Hg as described in her interview so it will be ready if she needs it for suctioning meconium from the baby's airway. She takes a look at the delivery table, which is already set up. She begins a check of the baby warmer...She rearranges the supplies in the drawer, showing me how she arranges the ET tubes by the size most often used to the front. She removes extraneous supplies [She only wants 2 of each item - more is too much and confuses things when you're in a hurry.] She checks the laryngoscope blades for functionality. The short blade works fine. The long blade doesn't work, and upon inspection she sees that there is no bulb in the blade. She replaces the blade with one from the delivery cart, places the defective blade in a bag and marks it "No bulb," places it on the delivery cart for later return to materiel services. She checks the function of the suction and the baby's ambubag, taking the mask off the bag and setting the valves so that the bag inflates quickly and has a cpap setting of 5…She checks that the O2 tanks have oxygen. [Important in case of 02 failure - warmer is connected to wall 02 outlet, but would need to run off the tanks if the 02 system failed.] She moves over to the sink and checks the emergency medication supply.*

This level of attention to baseline preparation was important in a number of ways. First, it required integration of technical knowledge of the equipment with medical knowledge of the physiology, pathophysiology, and trajectory of birth and its potential complications to understand the purpose of the equipment, how it specifically was to be used, why it was potentially life-saving, and what could happen if it was set up incorrectly.

> *[Field note] [The nurse] goes over to check the baby warmer…The ambubag pop-off valve is not set correctly. [She] makes the adjustments to get the valve working properly… [She says] "You can't just plug it in. It goes up to 40 [mm Hg] and you'll blow the kids lungs out!"*

Second, these seemingly routine tasks resulted in error trapping on every observation session I attended. Each of the five times I observed nurses checking the baby warmer, there was a mistake in some part of the set-up, most typically with the ambubag. Likewise, the maternal ambubag set-up was faulty on two observations. The nurses expressed their frustration with this problem, and felt they had to always check the equipment themselves, lest they count on a colleague having done it and be proven wrong:

> *"Because time is of the essence when you're doing an emergency resuscitation for baby or for mother or anything, and there's nothing worse than trying to put some equipment together and it not being there ready for you. And the seconds seem like minutes, you know. Which you don't have, and I suppose one of the worst things is going into a situation fast and not having enough time to- to make sure those things are in place. Hopefully the person before you did it and the fact is that they didn't do it properly and an emergency occurred, respiratory arrest, and you're grabbing for the bag and it's not hooked up."*

This feeling of isolation in the responsibility for conducting the checks became particularly stressful when things were evolving rapidly and the nurse felt she did not have enough time to complete the full set of equipment checks, as might occur when a woman was admitted close to birth and they "just had to make the best of it."

Knowing

The completion of detailed checks took on particular urgency at the beginning of the shift. This preparation was an important condition for allowing skillful anticipation to occur, and the nurses reported a variety of ways they integrated preparation activites into the time they spent getting acquainted with a woman and her family. Integration of getting aquatinted with preparation was important because time was limited and *knowing the patient* increased the nurse's ability to make an insightful assessment of the

situational potential embedded in a specific set of clinical circumstances (i.e., what might happen and how the people involved in the situation might react). Knowing the patient was a function of information (knowledge of the patient's history and plan), temporality (time spent with the patient to obtain knowledge of her responses), and assessing family dynamics. In order to know the patient well, the nurse needed to get a good hand-off report, have time to review the history and the chart, and spend time at the bedside with the woman and her family. Knowing the patient meant understanding the whole of the plan, not just executing the plan:

> *"Making sure I'm aware of who's seeing her [each patient], what orders are being written about her, what's being asked of me, what everything means as far as orders and plans, and keeping communication open."*

Knowing the patient and spending time at the bedside contributed to skillful anticipation by allowing the nurse to become very familiar with the woman's immediate situation and develop a comprehensive plan for meeting her needs. This allowed the nurse to project potential difficulties or complications with labor, birth, postpartum, breastfeeding, and family issues and thereby lay the groundwork for addressing potential problems. Time at the bedside promoted successful rescue from complications. For example, when nurses were able to remain at the bedside more continuously, they were able to provide better surveillance, identify subtle changes in a woman's condition, and mobilize the team to respond to issues such as an epidural block that was higher than desired, progress or lack of progress in labor, and unusual behavior in reaction to medication.

Knowing the colleague. Knowing the colleague gave nurses the ability to project how others might decide to manage specific situations, thereby providing insight about

what to expect. This entailed understanding variations in practice styles, particularly of physicians and certified nurse-midwives (CNMs), and having a sense of how other clinicians were likely to respond emergent situations.

> *"There are certain people that I know if they're there with me in an emergency situation, things will just flow, that I don't even have to worry. Everybody just kind of knows what each other- each person is thinking about and we just work really well together."*

Knowing the colleague also meant understanding colleague's personality and level of experience. For example, nurses varied their communications with residents and their level of acceptance of specific plans based on both the collegiality of person they were dealing with, and the person's progression through training. Thus nurses were more directive with interns than with more experienced residents, especially at the time of birth and during potential emergency situations:

> *[Field note] The intern comes back at around 1100 to recheck the patient. She is unsure on exam whether she feels cervix or [umbilical] cord and asks the nurse to get the chief. [The nurse] reminds the intern to keep her hand in the vagina and put pressure on the fetal head. She then calls out on the intercom, and requests that both the chief and the attending come down to the room. She then immediately checks the bed for tangles and lines [thinking about getting the patient out of the room in a hurry].*

Envisioning the whole picture. The key process that enabled skillful anticipation to occur was *envisioning the whole picture.* As one nurse remarked, *"It's like, switching gears from just doing what's in front of your nose and seeing that what's in front of your nose has wings. And you have to anticipate, prepare, and follow through on a bigger-bigger thing going on."* This occurred more easily when the nurse had the resources and time to prepare the environment appropriately and get to know the patient. A collegial relationship with the physician or midwife was also important because it enhanced the

open flow of information, thereby promoting the nurse's knowledge of the plan for the patient and providing a sense of the direction(s) in which the scenario might evolve.

The nurse's ability to envision the whole picture was not always dependent on knowing the patient or the situation, *"I could tell by just looking on the floor, even though I didn't have the full picture of what was going on. This was an excessive amount of blood that she'd lost."* However, this ability was greatly enhanced when time and adequate information were available to her. Envisioning the whole picture was also facilitated by the nurse's awareness of the operational context of care. This encompassed her understanding of the whole of what was happening on the unit at that moment in time, especially there were multiple competing demands and staffing was limited.

> *"So I said, "The person will be admitted, but she cannot have Miso or Pitocin." And the provider was shocked. The provider was shocked that I was saying no to Miso because to the provider- the provider's just throwing some Miso in. And I'm thinking, "No, there has to be a nurse that's going to watch that strip and make sure that baby is handling whatever's going on in response to mama receiving the Miso, plus mama." You know? And that would be me. And that is not safe. It's not safe to have me at the desk as charge, in triage, and watching somebody who just got Miso. So no, we're not doing it."*

All of the participants demonstrated a similarly keen understanding of the operational context in which care was provided. The nurses were very sophisticated in their knowledge of whom they might rely on, where they could obtain the necessary resources and expertise to address specific problems, and creative in their ability to get cooperation from other departments when needed. However they were also quite clear that at times keeping patients safe meant not initiating new activities on a full unit because there were no more resources to be found.

Conditions and Context Presenting Challenges to Skillful Anticipation

Despite the nurses' technical know-how, sophisticated knowledge of the needs of the women and families they cared for, and attunement to the operational context of care, their ability to envision the whole picture and engage in skillful anticipation was frequently threatened on multiple levels. There were many challenges to maintaining the conditions of mental readiness and preparation necessary for skillful anticipation. Fatigue and environment were particularly problematic. Participants found both mental and physical fatigue challenging. They were physically tired from working long shifts, rotating shifts, and night shift. They were mentally exhausted from what some described as the overwhelming level of stimulation in the environment, especially on the day shift.

> *"On days, I find that I hope I don't have an emergency between 4 and 7[PM]. Because by 9 or 10 hours into a [12-hr shift] you have to focus so much that its tiring for your brain to have to be focused and 'on' for 12 hours. So I'm sure that I'm not as sharp in an emergency at 5 as I would be at 8 in the morning."*

The participants were concerned about how this mental exhaustion might affect their responses, and also described the effects of fatigue as becoming even more difficult to manage as they got older.

> *"I'm finding that the torquing, the breaking down the beds, the leaning over to help breastfeed, um, the physical work, it's making me more exhausted. But even more than that, the absence of a protected period to clear my head, and the combination of the two is deadly…And I think that more than the physical part, I think it's the- it's a neurological barrage on the day shift… It's just, you can't- you don't even have a cubic foot of your own to work in. I think a lot of people could handle that better in their 20s or their early 30s, you know? And I just- it's starting to drive me crazy."*

In addition to these sources of physical and mental fatigue, both human and non-human resources were often limited in the nurses' work environments. Participants in

both settings described how they spent considerable time and energy gathering the material resources they needed to execute basic job functions and keep the systems of patient care running.

> *"As the infrastructure of the hospital is increasingly eroded, there are more errands to send people on, like going to the pharmacy, picking up the discharge meds from downstairs, but then going to the inpatient pharmacy to pick up the thing you've been waiting for hours and you're not waiting [can't wait] for it anymore. You need somebody to go get it. The blood gas machine breaking in the nursery and then you're running somebody down to the ER stat lab....Something got muddled in the census and dietary didn't have the right diet orders and now people don't have lunches. And so you're sending somebody down to get meals."*

In interviews and observations the nurses described being worn down by constantly hunting for supplies. They walked the length of the unit repeatedly, or even left the unit several times during the shift, to acquire items they needed for basic care of women and families. The degree to which the nurses were called upon to keep dysfunctional systems from failing entirely was painfully clear during participant observations.

> *[Field note] Another nurse is on the phone at the main desk saying "We are in surgery and the bandage scissors are missing. The patient is in the OR, on the table, and we can't cut the uterus without the bandage scissors! I need you to run some up right now." She hangs up and says, "I'm going to give him 5 minutes, then I'm calling back." There is discussion at the desk about how this has been going on for two weeks with the bandage scissors.*

> *[Field note] When we return to the room [the nurse] starts taking vital signs, then she notices there is no BP cable in the drawer. She checks the monitor drawer on the adjacent bed - none there either. She comments that the BP cables and the pulse ox cables have been missing a lot lately. We hunt down a portable BP machine and bring it to the room. As [she] takes the blood pressure I notice the machine has a red tag on it [meaning it should have been pulled from service], saying "Not staying on."*

The physical fatigue and distraction inherent in these environments were a constant for participants. This affected their mental preparation of self and physical preparation of the environment. They were frequently interrupted from bedside care to go find things that were not where they were supposed to be or had not arrived on time. Another effect was numbness to the degree of dysfunction they were so busy managing, and a resulting 'culture of low expectations' where the nurses no longer expected to find what they needed when they needed it. Several nurses described ways staff worked around the system to get medications to patients on time (or at all). One nurse described the medication dispensing station as, "the omni-hell, the unsure-med," and another commented, "Shit is *always* broken." Finally, at times the attention required to prepare equipment and supplies, combined with the erratic availability of needed items, produced a level of interruption and distraction that detracted from the nurse's ability to provide appropriate surveillance and engage in skillful anticipation.

An example of how interruption and distraction threaten safety by disrupting surveillance and skillful anticipation occurred during a participant observation. The nurse was caring for two laboring women, and spent the first few hours of the shift interspersing her equipment checks and supply runs with patient assessments and bedside care. The field note excerpted below occurred about two hours into the shift. By this time the nurse had already had to leave the bedside to retrieve charts and forms that were not in the right place, and gather multiple medications, syringes, line tape, IV labels, monitor transducers and other miscellaneous supplies. She also made calls to report an overflowing toilet, a broken patient bed, and a missing breakfast tray. She corrected the set-up for an infant ambubag that was put together incorrectly, as she was also doing the

routine supply and equipment safety checks in two patient rooms. As she tried to get a woman prepared for an epidural, the nurse found still more things missing from the room:

> *[Field note] [The nurse] states she needs the IFM cable and would like to do an assessment before the patient gets her epidural, so we go on an IFM hunt. She looks at the different LDRs as we pass them on the way back toward Ms. B's room, also tries to remember which room she took the other one out of. Rooms 1 & 2 both have patients now, and she took the cable out of room 4. We go into room 6, but it does not have a cable. She says, "I don't like to take them out of patient rooms, and I don't like to take them out of the OR, but usually if they need one they come to the OR with it, so we'll get one from OR2. We need more of these, obviously." There is a cable in OR2, which [she] takes with her as we head back to Ms B's room. When [the nurse] goes to put the IFM in the monitor drawer, she notices the paper is running out and there is no more paper in the drawer. She goes to get monitor paper off the delivery cart, and there is none there. (The cart should have paper on it - most supplies should be restocked from the cart.) We go back out to the utility room to get paper from the supply machine. [She] says, "It's the most frustrating thing about this job. My goal is to be done by 9:00 with this stuff."*

Not only was the nurse stressed, frustrated, and tired from the many trips she had taken to locate what she needed for basic care, she discovered shortly thereafter that she had forgotten to check for laboratory results on both of her patients. Epidural placement had already started on a woman at risk for preeclampsia before the nurse recognized this slip. The team missed the planned pre-epidural assessment of the woman's platelet level, the purpose of which was to avoid placing her at risk for an epidural hematoma.

Discussion

Perinatal nurses provide most of the bedside care and management of labor in many settings (James, Simpson & Knox, 2003), and therefore are theoretically expected to play a pivotal role in maintaining safe perinatal patient care. These results describe how perinatal nurses specifically contribute to keeping women and their babies safe during labor and birth in modern inpatient settings.

Perinatal nurses in these two teaching hospitals promoted safe birth by preparing the environment, anticipating potential problems, and trapping errors before they reached the patient. They had a sophisticated awareness of both the individual women in their care and the operational context of care that allowed them to skillfully anticipate the physical, psychological, and emotional safety needs of women and their families. Even the seemingly simple task of "checking equipment" encompassed critical medical and technical knowledge work, which nurses performed under conditions of distraction, interruption, and seriously inadequate resources. The problems in the work environment impaired the nurses' ability to create safety when they interfered with maintaining appropriate surveillance and engaging in skillful anticipation. While the conditions described are setting specific, they can be presumed to be present in at least some other inpatient settings given the prevalence of economic pressures to make do with less. Time pressure and understaffing have also been identified as barriers to safety in other clinical settings (Henneman et al., 2006; Jirapaet, Jirapaet & Sopajaree, 2006).

In the example of the epidural placement discussed above, the distractions imposed by the continuous interruption to look for items contributed to the nurse's mental slip, directly threatening patient safety. If the nurse had not been distracted and stressed by the supply situation she likely would have checked the laboratory results and verbally confirmed them with the anesthesia residents when she called for the epidural placement. The anesthesia team also committed a lapse in this situation, as they did not engage in any cross-checking. Neither the nurse, nor the anesthesia resident, nor the supervising anesthesia attending asked for results before going forward with the procedure. This is an example of both latent conditions in the environment (status of the

supply chain) and active failure of defense-in-depth (policy, procedural rules, and overlapping responsibility for checking results) contributing to a potentially hazardous patient care situation.

These results support Rothschild et al.'s (2006) contention that nursing makes an as-yet under recognized contribution to the safety of patient care, and more research attention is needed to fully elucidate the patient safety activities embedded in everyday nursing practice. The results also emphasize the importance of observing systems of care and obtaining clinicians' perspectives on challenges they face in striving to maintain safety, since these conditions represent direct threats to the safety of childbearing families. Perinatal nurses are responsible for the majority of maternal-fetal assessment and monitoring during labor, management of oxytocin infusions, and management of second stage labor in most inpatient birth settings (Simpson, 2005). Thus the nurse's role in maintaining safety may be even larger in community settings where physician and certified nurse-midwife providers may not be on-site for most of a woman's hospital admission (Simpson, 2005). Further research is needed in varied settings to confirm and expand the description of how nurses specifically contribute to the safety of women and newborns in inpatient birth settings.

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Figure 1. Coming through the experience intact

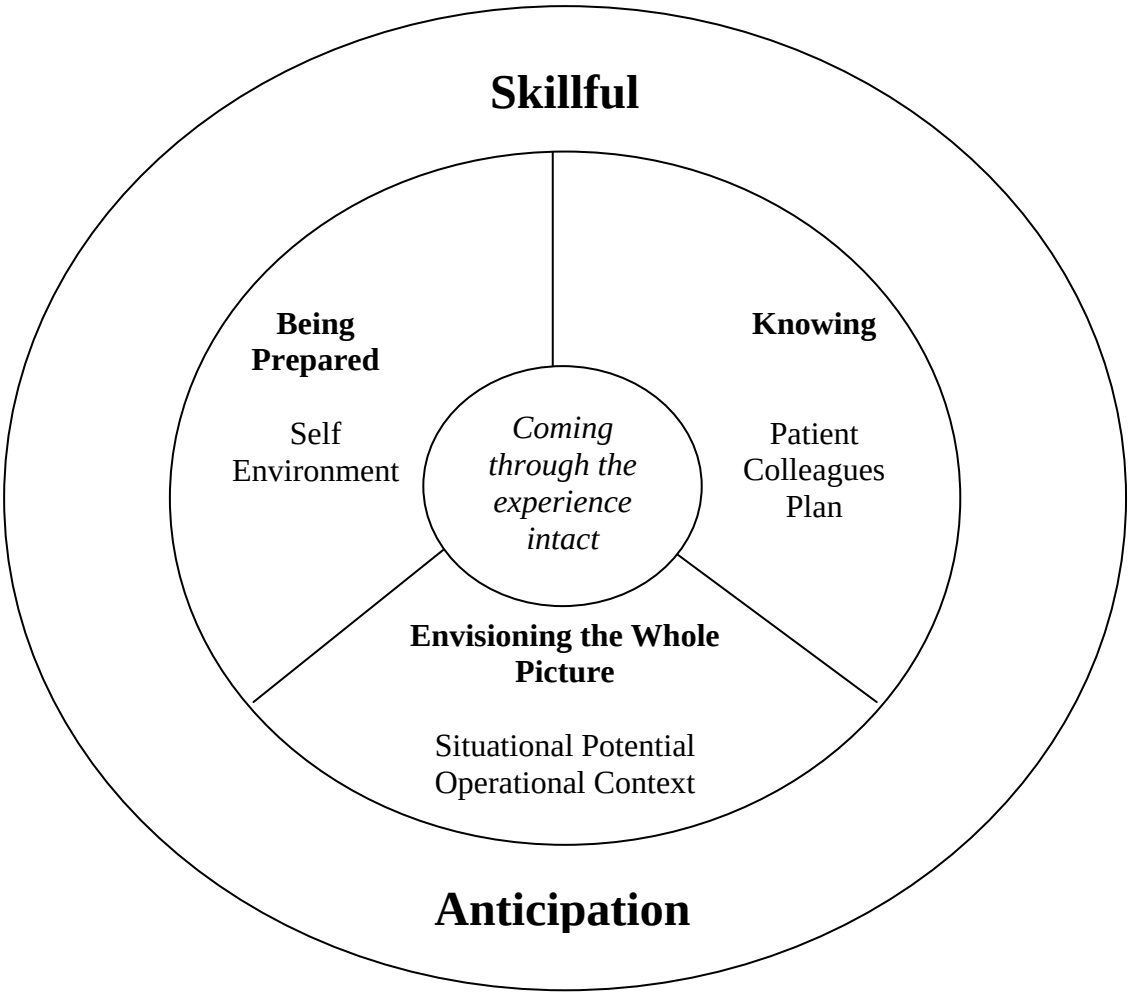

Table 1. Explanatory matrix where Skillful Anticipation has the status of "perspective."

Perspective: Skillful Anticipation			
Dimensions of Experience			
Consequences	**Conditions shaping central action**	**Processes set in motion by conditions**	**Context in which the phenomenon is embedded**
Coming through the experience intact	Being Prepared Knowing Fatigue Environment	Envisioning the whole picture	Availability of resources

Synthesis

This research stemmed from curiosity about variations I observed in clinical practice regarding perinatal nurses' willingness and ability to assert their concerns with persistence in problematic clinical situations. Four papers were presented: a conceptual approach, a review of selected literature, and two papers reporting study results. This chapter will synthesize the key observations from the four papers, clinical implications, and directions for future research.

The first paper presented a conceptual approach to the problem of the nurse's role in patient safety and factors that might influence execution of that role. The conceptual approach integrated organizational accident theory (OAT), high reliability organization theory, and symbolic interactionism to achieve a broad perspective on challenges to perinatal reliability in the context of modern inpatient birth settings. This integration provides new breadth in the analysis of perinatal safety and accidents by allowing analytic flexibility for navigating across levels of individual, group, and system.

As discussed in the first paper, OAT emphasizes the way system level function creates latent failures through the unseen and unintended consequences of decisions made distant from direct care of patients. Most of the time patients are protected from latent system failures by complex sets of defenses. However, these failures can be thought of as seeded "resident pathogens" remaining dormant in the operating environment. Occasionally, their potential energy is released by a combination of latent and active errors, their destructive potential is realized, and catastrophic harm reaches patients (Reason, 1990, 2000). This framework for understanding organizational contributions to accidents has been essential in beginning to move health care away from a focus on the individual clinician's role in adverse patient outcomes and reducing the traditional

"blame and shame" approach to accident analysis in health care (Kohn, Corrigan & Donaldson, 2000).

High reliability organization (HRO) theory encompasses both a system and a group level of analysis in considering the safety of organizations. HROs recognize the importance of system effects and latent conditions on safety. In recognition of both the human and the system propensity for error, HROs consistently prioritize safety over production pressure. The tendency toward error is managed through an emphasis on communication and competence, essentially compensating for human cognitive processes that can produce lapses and mistakes by creating an environment of collective vigilance (Rochlin, 1999; Weick & Sutcliffe, 2001). The aviation industry adopted an HRO approach many years ago and achieved dramatic safety improvements. Many of these improvements are attributed to the crew resource management (CRM) training model, which emphasizes flattening of hierarchy, use of inquiry and assertion to question superior officer decision making when needed, collective responsibility for safety, and awareness of the influence of stress and fatigue on human performance (Helmreich, 2000; Weick & Sutcliffe, 2001).

Review of selected studies from the aviation literature in the second paper demonstrated that pilot attitudes regarding stress, fatigue, communication, and teamwork were highly predictive of observed flight performance (Helmreich, Foushee, Benson, & Eussini, 1986), and that high functioning teams engaged in more advance planning and used more communication behaviors than low-performing flight teams (Bowers, Jentsch, Salas & Braun, 1998; Stout, Canon-Bowers, Salas & Milanovich, 1999). These behaviors are believed to contribute to the formation of shared mental models of the situation and

thereby enhance safety through attainment of situation awareness by the entire crew (Stout et al., 1999). Crew situation awareness was lost more frequently when the pilot flying was the captain rather than the first officer, and lack of assertion was a factor in uncorrected captain errors (Jentsch, Barnett, Bowers & Sales, 1999). Targeted team training resulted in significant improvement in attitudes, knowledge, and performance in simulation exercises (Stout, Salas & Fowlkes, 1997).

Studies of safety attitudes in health care providers revealed a concerning incidence of problematic attitudes relative to those demonstrated by pilots (Gaba, Singer, Sinaiko, Bowen & Ciavarelli, 2003; Sexton, Thomas & Helmreich, 2000). Health care providers were much less aware of the effects of stress and fatigue on their own performance, and higher status providers (such as surgeons) had significantly more positive perceptions of teamwork than did lower status providers (such as nurses) (Sexton et al., 2000; Thomas, Sexton & Helmreich, 2003). The incidence of problematic attitudes was also higher in more high risk domains of the hospital, such as intensive care units, emergency rooms, and operating rooms (Gaba et al.).

Observations of the parallels between aviation and medicine relative to hierarchy and high-stakes decision making have generated calls for adoption of the CRM training model in hospitals generally and in perinatal environments specifically (Helmreich, 2000; Leonard, Graham & Bonacum, 2004). Theoretically, adoption of the CRM model would improve safety by improving safety attitudes. However, the empirical links between safety attitudes and patient outcomes have yet to be firmly established in health care settings (Lyndon, 2006), and results for trials of team training interventions have been mixed (Grogan et al., 2004; Morey et al., 2002; Nielsen et al., 2007; Shapiro et al., 2004).

I have proposed that one possible reason for these mixed results is that baseline data are missing about health care provider perspectives on the challenges they face in maintaining collective agency for safety. This is important because CRM programs were developed from a combined approach of incident analysis and talking to pilots about flying (Helmreich & Foushee, 1993), and because in the cockpit there is only one profession – pilots (Tamuz & Thomas, 2006). Health care teams, on the other hand, are interprofessional and have historically been characterized by very strong power gradients between disciplines. If the transferability of CRM has been problematic across settings even within the aviation industry (Helmreich, Merrit & Wilhelm, 1999), then it can be expected to be more so in organizations with a greater complexity of personnel and power differentials.

Specifically, assertive communication has been identified as the key skill for maintaining safe operations in perinatal care and nurses are uniquely positioned to use assertive communication in the interest of maintaining safety. However, little is known about nurses' assertive communication skills or the challenges they face in asserting their concerns, and no instruments currently exist to measure assertive communication skills as defined in the context of patient safety.

What is known from safety attitude surveys is that nurses find it more difficult than physicians to express concerns and believe they should have more input in decision making (Sexton et al., 2000; Thomas et al., 2003). Newly published surveys have confirmed these findings and done so specifically in labor and delivery (Sexton et al., 2006). Similarly, in a nurse-focused ethnography reflecting the imbalance in power between nursing and medicine, critical care nurses' knowledge was given less weight

than physician knowledge, inconsistently accessed during decision making, and legitimated by reference to policy rather than experiential or scientific data (Manias & Street, 2000, 2001). Nurses are the "front line" for patient safety as the primary providers responsible for ongoing surveillance of the patient's condition and directly administering the majority of treatment (Clarke & Aiken, 2003; James, Simpson & Knox, 2003; Page, 2004). Despite this, nurses' contributions to the plan of care are under-valued and nurses' clinical judgment is often under-utilized or even ignored (Bucknall & Thomas, 1997; Cook, Hoas, Guttmannova & Joyner, 2004; Manias & Street, 2000, 2001; Page, 2004; Simpson & Knox, 2003).

Additional evidence is mounting that the collective agency for safety which is emblematic of high reliability organizations is largely absent in current health care environments. Studies have demonstrated that many health care providers often do not speak up about issues of concern because they do not believe anything will change, or may suppress their concerns due to fear of retaliation or other adverse interpersonal consequences (Blatt, Christianson, Sutcliffe & Rosenthal, 2006; Cook et al., 2004; Maxfield, Grenny, McMillan, Patterson & Switzer, 2005). Nurses, residents, physicians, and pharmacists also report regularly receiving incomplete, inadequate communications regarding important patient care issues and, as in this study, being recipients of intimidating behaviors from colleagues (Smetzer & Cohen, 2005; Sutcliffe, Lewton & Rosenthal, 2004). Labor and delivery nurses and physicians have also reported actively minimizing communication events regarding patient care issues (Simpson, James & Knox, 2006).

Summary of Findings and Implications

The purpose of the study reported here was to a) directly articulate the perinatal nurses role in maintaining safe birth and b) begin to close the gap in knowledge about health care providers' perspectives generally and perinatal nurses experiences specifically with working to prevent harm to patients. I hoped to gain a more focused understanding of facilitators and constraints to individual and collective agency for safety in perinatal care, and to more fully articulate how perinatal nurses directly contribute to maintaining safe care during labor and birth.

As discussed in the third and fourth papers, nurses in this study conceptualized safety broadly. Safety went beyond preventing errors to encompass protecting the physical, psychological, and emotional wellbeing of the woman and her family. Nurses maintained safety during labor and birth through *skillful anticipation* of the potentialities of given clinical situations. This required integration of medical and technical knowledge and skill with intimate knowledge of the woman and the operational context of care to achieve accurate situation awareness and appropriate future planning. Conditions and processes promoting skillful anticipation included *being prepared*, *knowing*, and *envisioning the whole picture*. Seemingly routine nursing tasks encompassed critical medical and technical knowledge work which nurses performed under highly stressful and distracting conditions.

The practice of skillful anticipation was one manifestation of perinatal nurses' agency for safety. This was a taken-for-granted aspect of clinical practice by nurse participants, but it had not been previously articulated in the literature. Perinatal nurses maintained safety by preparing themselves and the environment, anticipating problems

before they occurred, and trapping errors before they reached the patient. Lack of available resources, fatigue, and environmental distractions presented challenges to skillful anticipation, and thereby patient safety. The hidden contribution *being prepared* makes to patient safety is consistent with findings by Rothschild et al (2006) and Henneman et al (2006) documenting nurses' direct role in trapping and recovering errors in academic critical care units and emergency departments.

The most important finding was presented in the third paper: agency for safety varied among all types of providers in this study depending on the specific context of the clinical situation, and agency was greatly influenced by interpersonal relationships. While physicians and certified nurse-midwives believed they valued nurses' contributions to care, the units had deeply embedded traditional hierarchies. Nurses felt they were structurally excluded from important sources of information exchange and from contributing to the plan of care. Pervasive and mutually reinforcing segregation of activities by discipline impeded information flow, challenging safety. Nurses' confidence in their clinical assessments was a key driver for asserting their concerns. Confidence could be undermined in novel or ambiguous situations and by poor interpersonal relationships, resulting in a process of *redefining the situation as a problem of self* and potential lack of persistence regarding their concerns. All three disciplines engaged in conflict avoidance strategies in the service of maintaining harmonious relationships.

Transferability of Findings

These findings are specific to the units in which they were obtained, and these units are relatively unique in many ways. Academic settings have more layers of hierarchy for nurses to negotiate than community settings do, and most inpatient perinatal

care is provided in community settings following nurse-managed labor models (Simpson, 2005a). Study settings also had a degree of medical and social complexity that may place them outside the mainstream of inpatient birth settings in the United States. However, several points are salient regarding transferability of findings. At least some of the conditions which presented significant challenges to safety in these two settings are likely to exist elsewhere, given the massive cost-cutting measures of the 1990s and continued economic pressures faced by health care organizations today (Page, 2004). Secondly, the historical hierarchical structure of medicine and subordination of nursing in hospitals was deeply ingrained, and work processes were affected by this embedded hierarchy in ways that were especially difficult for physicians to recognize. While academic environments are not the norm for the majority of practicing perinatal nurses, all physicians are trained in academic settings. If other academic settings share characteristics of ingrained hierarchy, then physicians can be expected to emerge from training primed to relegate nursing knowledge and practice to a subordinate role. While there were only two certified nurse-midwives in the study, they also both expressed frustration with the hierarchy yet fully participated in it at times.

The expression of hierarchy in the segregation of work processes by discipline was detrimental to patient safety. The resulting chasm between the parallel worlds of nursing and medicine fundamentally impeded information flow, which decreased ability to generate shared mental models of the situation. It also meant that although advance planning was occurring, nurses were infrequently included in planning discussions. As discussed previously, aviation researchers have found that these are the types of situations in which leader errors are more likely to go unchallenged. The transfer of CRM

principles and safety culture between organizations has been problematic even within aviation (Helmreich et al., 1999). It is unlikely that team training will generate sustained changes in safety attitudes without addressing how deeply medical hierarchy is embedded in the everyday processes of providing perinatal care, and without understanding how this is uniquely expressed in specific organizations.

Findings regarding the high degree of perceived importance of interpersonal relationship have some surprising implications for considering safety culture. The accepted wisdom regarding promoting safety in organizations is that punitive cultures suppress reporting of accidents and near-misses, and development of a more open and non-punitive culture will promote or at least remove barriers to reporting (Page, 2004). In this study it was not necessarily a punitive organizational culture that suppressed reporting, but the sometimes overriding interest of maintaining harmonious relationships with colleagues. Participants, including physicians and CNMs, valued maintaining "good" relationships, and discussed how they would sometimes avoid reporting problems in the interest of maintaining those relationships. This suggests interactional processes between colleagues and coworkers may influence the reliability of perinatal units to a previously unrecognized degree, and these processes need to be attended to in clinical practice and in research.

Directions for Research

Women and their families should not be dependent on the relationships between providers for their safety, but interaction was a key factor in the dynamic nature of agency for safety. The clinical scenario presented in the first paper illustrated how clinicians' definition of the situation could change through interaction, resulting in a

temporary redefinition of the situation as less urgent. The scope of situational redefinition identified in this study extended beyond the urgency of the situation to include redefinition of the entire *nature* of the problematic clinical situation. This is a concerning finding because such redefinition was unpredictable and situation-specific, making it difficult to identify, plan for, or intervene to correct. Further research is needed to explicate this process more fully, understand how its expression may vary in varied contexts, and understand how to mitigate it to promote agency for safety.

Some specific lines of inquiry which could prove fruitful include further investigation of the determinants of "confidence," and exploration of how interactional processes are similar or different in community settings and other academic settings. Fuller examination of the perspectives of certified-nurse midwives and physicians is also important, as is pursuit of the perspectives team members not included in this study, such as anesthesia providers and pediatricians.

The development and testing of intervention strategies is complicated by the already challenging problem of measuring safety effectively in perinatal care. The generally healthy nature of women and babies make this population particularly resilient to errors and poor quality care. Traditional quality indicators do not accurately reflect the safety of care because adverse outcomes are so rare in this population (Simpson, 2005b). Measuring safety is measuring the invisible, something that does not happen, rather than documenting adverse events (Schulman, 2002). This may be an additional reason for the difficulty in establishing an empirical link between team training and improved patient outcomes using traditional measures, particularly in perinatal care, and needs to be considered in designing intervention research.

Simpson (2005b) has proposed the concept of “failure to rescue” be adapted to a process measure for application to perinatal care. This would entail looking for evidence of safety in the processes rather than the outcomes of care. Examples include chart review for the incidence of and clinical response to uterine hyperstimulation during induction and augmentation of labor, and assessments of the clinical response to nonreassuring fetal heart rate patterns. While much more labor intensive to evaluate than traditional outcome measures, these processes may be more sensitive to changes due to patient safety interventions such as team training, and could prove a fruitful measurement mechanism. Development of instruments for measuring self-efficacy for assertive communication and assessment of actual use of assertive communication in the patient safety context will also be important for assessing future interventions.

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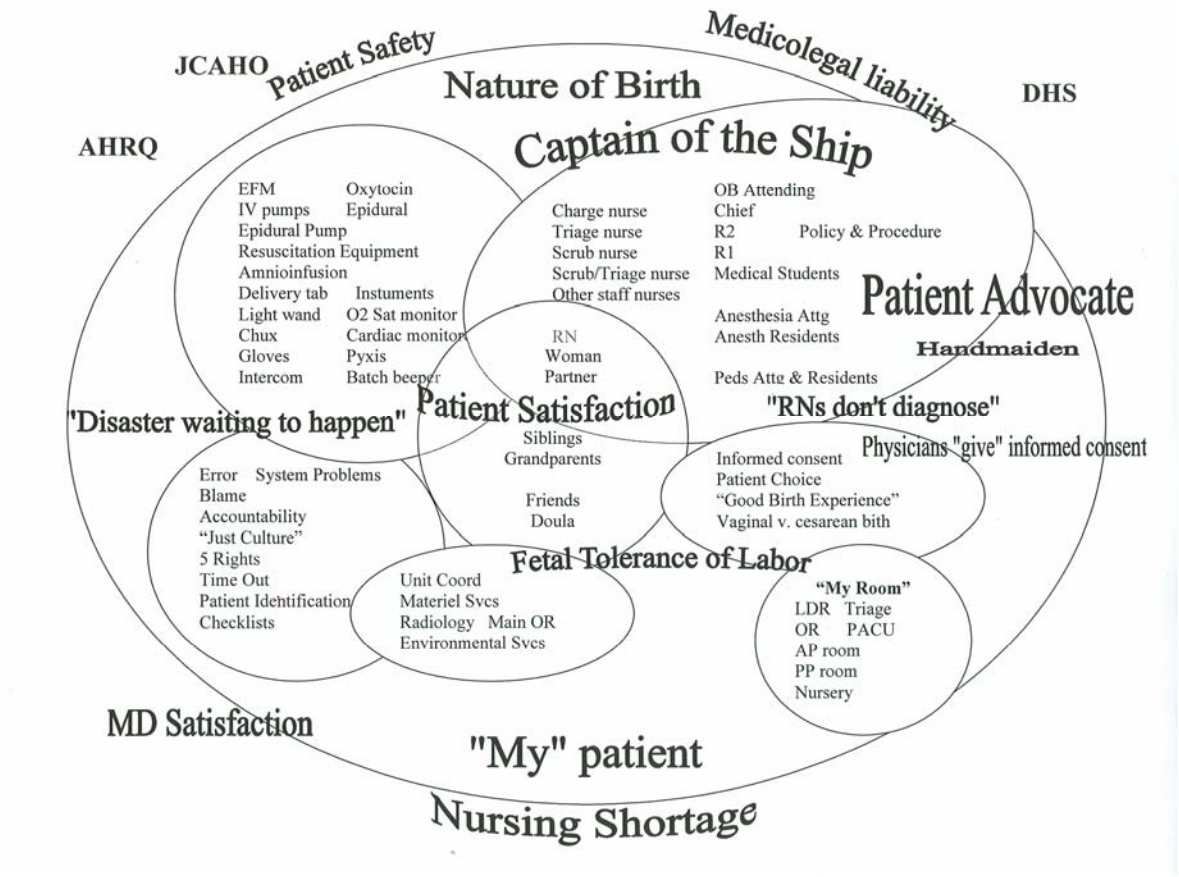
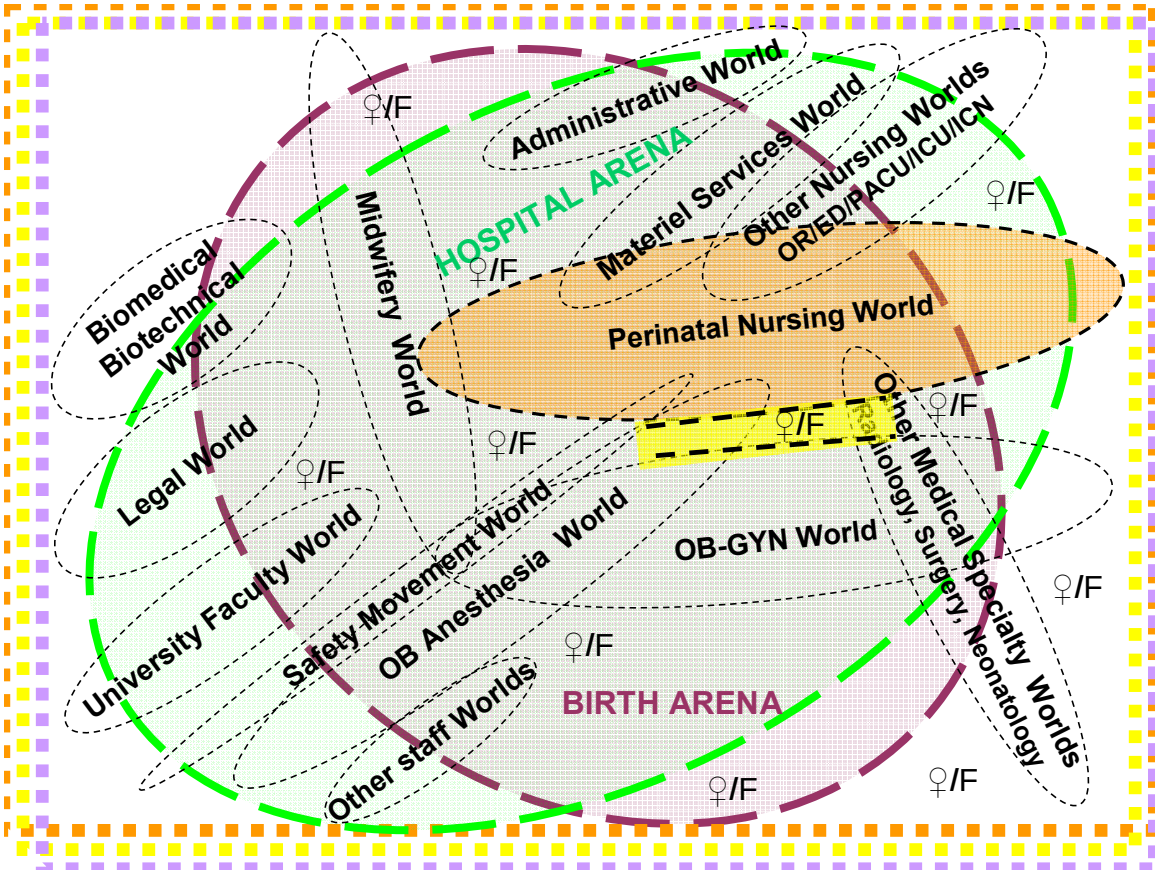
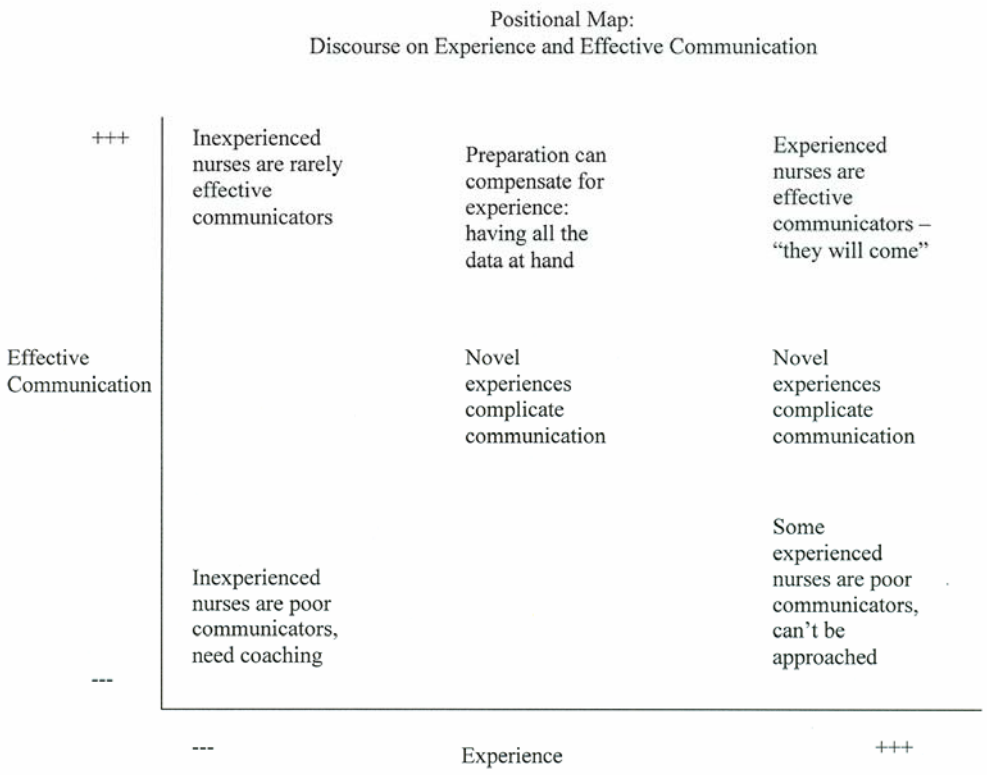
Situational Map

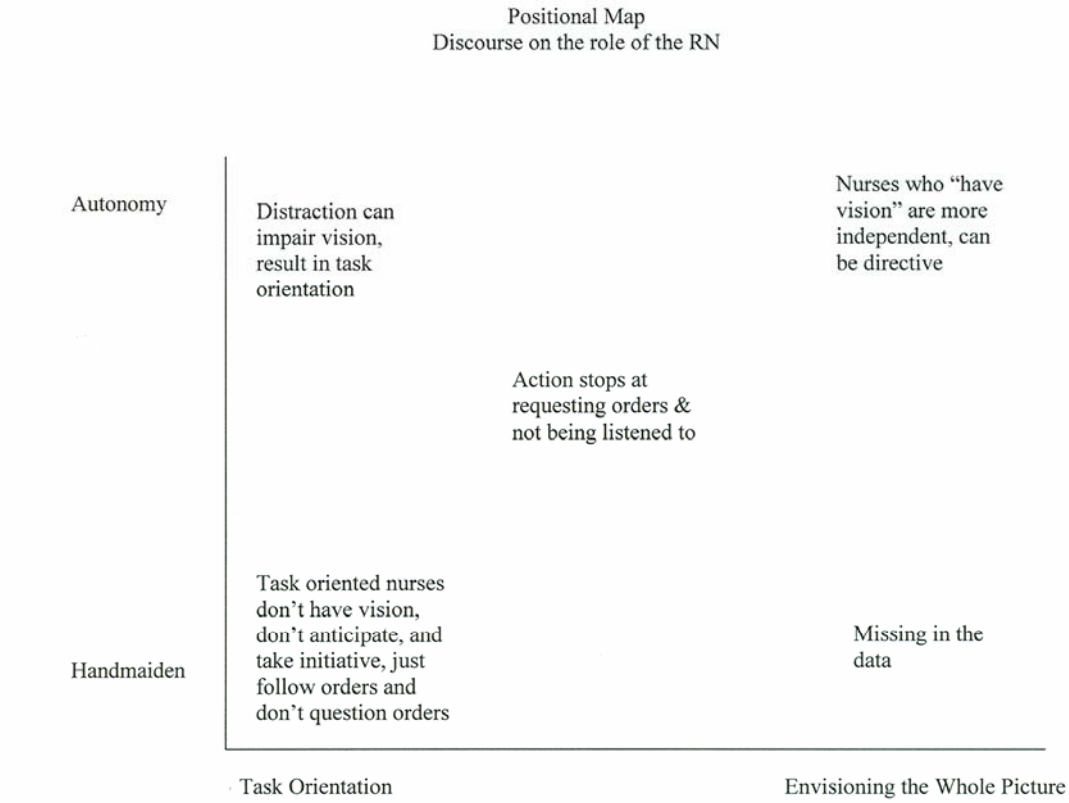


Social Worlds/Arenas Map




Positional Map:
Discourse on Experience and Effective Communication
+++
Effective Communication

Inexperienced nurses are rarely effective communicators
Preparation can compensate for experience: having all the data at hand
Experienced nurses are effective communicators – "they will come"
Novel experiences complicate communication
Novel experiences complicate communication
Inexperienced nurses are poor communicators, need coaching
Some experienced nurses are poor communicators, can't be approached
---
Experience
+++


Positional Map
Discourse on the role of the RN
Autonomy
Handmaiden
Distraction can impair vision, result in task orientation
Nurses who "have vision" are more independent, can be directive
Action stops at requesting orders & not being listened to
Task oriented nurses don't have vision, don't anticipate, and take initiative, just follow orders and don't question orders
Missing in the data
Task Orientation
Envisioning the Whole Picture
Discourse on the role of the RN

Committee on Human Research

Project Summary Sheet

CHR: H7350-27331-02

Study Title

Exploring the Nurse's Role in Perinatal Patient Safety

Principal Investigator

Kathryn Lee Title: Professor

Department: Family Health Care Nursing

Phone: 476-4442 Fax: E-Mail: kathy.lee@nursing.ucsf.edu

Address: Box 0606

Contacts

Name	Position	Box	Phone	E-Mail
Lee, Kathryn	PI	0606	476-4442	kathy.lee@nursing.ucsf.edu
Kools, Susan	Former PI	0606	476-4040	susan.kools@nursing.ucsf.edu
Lyndon, Audrey	Co-PI	0606	510.531.1847	audrey.lyndon@sbcglobal.net

Human Subjects Training

The PI and Co-PI must complete the UCSF online training course: Protecting Human Research Subjects

Name	Last Completed
Lee, Kathryn	11/22/02
Lyndon, Audrey	3/24/05

Review Details

Approval Number	Status	Received	Reviewed	Approved	Expires
H7350-27331-02	Approved	6/14/2006 12	6/29/2006 12:	6/29/2006 12	6/29/2007
H7350-27331-01	Approved	6/24/2005 12	8/10/2005 12:	8/10/2005 12	8/10/2006

Attachments: UCSF Consent Form, Dated 6/12/06

[redacted] Consent Form, Dated 9/15/05

Focus Group Information Sheet, Dated 6/12/06

Consent Form, dated 6/24/05

Special Study Information

Site: [redacted]

Populations:

- How many subjects will be enrolled here: 15

Will subjects be paid: Yes

Drugs and Devices

Name	IND/IDE No.

Funding

Agency / Sponsor Name	Award No.	Type	Funded
			Pending

FederalWide Assurances

The CHR is the Institutional Review Board (IRB) for UCSF and its affiliates. The institutional FederalWide Assurance (FWA) numbers are listed below. Not all of the following FWA numbers apply to this study.

Institution	FWA #
UCSF	00000068
Ernst Gallo Clinical and Research Center (EGCRC)	00000304
J. David Gladstone Foundation	00000087
Northern California Institute for Research and Education (NCIRE)	00000256
San Francisco department of Public Health (SFDPH)	00000162
San Francisco General Hospital (SFGH)	00000315
Veterans Affairs Medical Center (VAMC)	00000280

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO
CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Study Title: Exploring the Nurse's Role in Perinatal Patient Safety

This is a research study about nurses' and other health care providers' experiences of the personal, organizational, and social factors that promote or inhibit effective communication, teamwork, and clinical decision-making in perinatal care settings. The study researcher, Audrey Lyndon, RNC, MS, CNS, from the Department of Family Health Care Nursing, will explain this study to you. Ms. Lyndon's research is being supervised by Dr Kathryn Lee from the Department of Family Health Care Nursing.

Research studies include only people who choose to take part. Please take your time to make your decision about participating, and discuss your decision with your family or friends if you wish. If you have any questions, you may ask the researcher or her supervisor, Dr. Kathryn Lee.

You are being asked to take part in this study because you are a perinatal nurse, physician, or midwife who has volunteered, or because a colleague has nominated you for the study based on your clinical skills.

Why is this study being done?

The purpose of this study is to learn more about how and when nurses decide to intervene to maintain safe patient care, and to learn more about the barriers to preventing patient harm that are experienced by nurses and other providers working in OB settings.

Who pays for this study?

The study is being paid for by a grant from the Association of Women's Health, Obstetric, and Neonatal Nurses, and by the researcher's personal funds. The researcher does not have any financial interests in the study outcomes.

How many people will take part in this study?

About 40 people will take part in this study. Nurses, physicians, and midwives from the OB units at [redacted] will participate in the study.

What will happen if I take part in this research study?

If you agree, the following procedures will occur:

- The researcher will interview you for 60-90 minutes in a private setting. The researcher will ask you to describe your experiences with the management of rapidly evolving clinical scenarios, and situations were things have not gone well for a patient. You will be asked to talk about communication and teamwork in your work setting, and your working relationships with other health care providers. You will be asked to talk about the major influences on your clinical decision-making.

- You may be asked to participate in one or two follow-up individual interviews or focus group interviews on the same subjects in order to further explore themes that come up in your interview.

    - Some participants may be asked for a second or third individual interview. If you are asked and agree to participate in follow-up interviews, the interview will be used to clarify or expand on information covered in your previous interview(s).

    - Some participants will be asked if they are willing to participate in a focus group to talk about the ideas the researcher is developing from the study. If you are asked and agree to participate in a focus group, it is possible the group may contain people you know or work with. Identities of focus group participants will not be recorded for study purposes, and the researcher will ask you and the other people in the group to use only first names during the group session. They will also ask you not to tell anyone outside the group what any particular person said in the group. However, the researchers cannot guarantee that everyone will keep the discussions private.

- The researcher will make a sound recording of your conversation(s). After the interview or focus group, someone will make a word-for-word transcription of what is on the tape, and will remove any mention of names or work location. The researcher will review the transcription for accuracy. The sound recordings will be destroyed when the study is completed.

- The researcher may ask you if you are willing to be observed giving direct care to patients and otherwise conducting your work in your work setting.

- Study location: The interviews will be done in a private location you agree to. The interviews may be done at your home or office, or in a private room on the UCSF campus. Work observations will take place in your Labor & Delivery setting.

How long will I be in the study?

Participation in the study will take a total of about 1 to 4.5 hours, depending upon how many times you are asked and agree to be interviewed. Observation of clinical practice will take place during regular work hours and will not require additional time on your part.

Can I stop being in the study?

Yes. You can decide to stop at any time. Just tell the study researcher right away if you wish to stop being in the study.

Also, the study researcher may stop you from taking part in this study at any time if she believes it is in your best interest.

What side effects or risks can I expect from being in the study?

- Some of the discussions may be about patient care situations that resulted in poor outcomes. These discussions could make you uncomfortable or otherwise upset or disturb you. You are

free to decline to answer any questions you do not wish to answer, or to stop the discussion at any time.

- Disclosure of confidential information about poor patient outcomes outside of the research could place you at risk for malpractice claims or threaten your professional reputation. However, in order to protect both your anonymity and the patients' confidentiality, no identifying information will be collected about any of the patients whose care may be discussed in the course of this study.
- For more information about risks, ask the researcher.

Are there benefits to taking part in the study?

There will be no direct benefit to you from participating in this study. However, the information that you provide may help health professionals to learn more about preventing adverse perinatal outcomes, and promoting optimal team performance in perinatal care.

What other choices do I have if I do not take part in this study?

You are free to choose not to participate in the study. If you decide not to take part in this study, there will be no penalty to you.

Will information about me be kept private?

We will do our best to make sure that the personal information gathered for this study is kept private. However, we cannot guarantee total privacy. Your personal information may be given out if required by law. If information from this study is published or presented at scientific meetings, your name and other personal information will not be used.

Organizations that may look at and/or copy your research records for research, quality assurance, and data analysis include:

- UCSF Committee on Human Research[redacted]r Institutional Review Board[redacted] Institutional review Board.
- The UCSF School of Nursing Faculty who are supervising the conduct of this study.

What are the costs of taking part in this study?

You will not be charged for any of the study procedures.

Will I be paid for taking part in this study?

You will receive a gift certificate valued at $15.00 for each interview and each shadow observation, in recognition of your valuable time taken to participate in the study.

What are my rights if I take part in this study?

Taking part in this study is your choice. You may choose either to take part or not to take part in the study. If you decide to take part in this study, you may leave the study at any time. No matter what decision you make, there will be no penalty to you in any way.

Who can answer my questions about the study?

You can talk to the researcher(s) about any questions or concerns you have about this study. Contact the researcher Audrey Lyndon, RNC, MS, CNS at 510-847-1480, or her supervisor, Dr. Kathryn Lee, at 415-476-4442.

If you have any questions, comments, or concerns about taking part in this study, first talk to the researcher (above). If for any reason you do not wish to do this, or you still have concerns after doing so, you may contact the office of the **Committee on Human Research**, UCSF's Institutional Review Board (a group of people who review the research to protect your rights).

You can reach the CHR office at **415-476-1814**, 8 am to 5 pm, Monday through Friday. Or you may write to: Committee on Human Research, Box 0962, University of California, San Francisco (UCSF), San Francisco, CA 94143.

****

CONSENT

You have been given a copy of this consent form to keep.

PARTICIPATION IN RESEARCH IS VOLUNTARY. You have the right to decline to be in this study, or to withdraw from it at any point without penalty or loss of benefits to which you are otherwise entitled.

If you wish to participate in this study, you should sign below.

_____	_____
Date	Participant's Signature for Consent
_____	_____
Date	Person Obtaining Consent

Exploring The Nurse's Role in Perinatal Patient Safety

PtSafetyStudy **Form A-2**
Volunteer or Nomination Form

Clinicians' Stories Needed for Research

Your clinical experience is needed for research about nursing practice, decision-making, and teamwork in perinatal care.

Audrey Lyndon, an OB nurse and UCSF graduate student, is doing a study looking at perinatal nurses and other OB providers' experiences with managing complicated patients, rapidly evolving clinical situations, and keeping patients safe. She would like to talk with:

- OB nurses who are especially good at managing complicated patients or rapidly evolving clinical situations.
- OB nurses who have had experiences when they have had to work really hard to get someone to listen to their opinion about a patient.
- Obstetricians and Certified Nurse Midwives who have a story to share about being "saved" by a nurse.

Does this describe you, or someone you know? Please consider volunteering and/or nominating a colleague for this study. Your expertise, and the expertise of clinicians like you, is vital to enhancing collaboration and teamwork in perinatal care.

Ms. Lyndon is asking for about one hour of your time for an interview about your experiences. The interview will be kept strictly confidential, and no patient-identifying information will be collected. The information from the interview will be used for research purposes only. You may be asked to participate in more than one interview, but that is completely up to you. Participation is voluntary, and you have the right not to participate in the study.

If you'd like to participate, you may contact Ms. Lyndon directly by phone (510-847-1480) or email (audrey.lyndon@ucsf.edu), or fill out this form and return it by mail in the stamped, self-addressed envelope provided.

Yes, I am interested in participating:

Name:_____ Phone:_____

Email:_____ Best time to call:_____

Prefer to be contacted by ☐ phone ☐ email

I'd Like to Nominate a Nurse for the Study:

Nominee's Name:_____ Work Location:_____

My name:_____ I am a: ☐ Nurse Colleague ☐ MD ☐ CNM

I am nominating this nurse because:

_____

_____

Thank you so much for your valuable time!

PtSafetyFormA-2: 6-12-06

Exploring The Nurse's Role in Perinatal Patient Safety

PtSafetyStudy **Form A-3**
Nomination Letter

Clinicians' Stories Needed for Research

Your clinical experience is needed for research about nursing practice, decision-making, and teamwork in perinatal care.

Audrey Lyndon, an OB nurse and UCSF graduate student, is doing a study looking at perinatal nurses and other OB providers' experiences with managing complicated patients, rapidly evolving clinical situations, and keeping patients safe. She would like to talk with:

- OB nurses who are especially good at managing complicated patients or rapidly evolving clinical situations,
- OB nurses who have had experiences when they have had to work really hard to get someone to listen to their opinion about a patient,
- Obstetricians and Certified Nurse Midwives who have a story to share about being "saved" by a nurse.

A colleague who thinks you have experience that will be important for helping us understand the skills that work in these types of situations has nominated you for the study. Please consider volunteering for this study: your expertise, and the expertise of clinicians like you, is vital to enhancing collaboration and teamwork in perinatal care.

Ms. Lyndon is asking for about one hour of your time for an interview about your experiences. The interview will be kept strictly confidential, and no patient-identifying information will be collected. The information from the interview will be used for research purposes only. You may be asked to participate in more than one interview, or to allow Ms. Lyndon to observe you at work, but that is completely up to you. Participation is voluntary, and you have the right not to participate in the study.

If you'd like to participate, you may contact Ms. Lyndon directly by phone (510-847-1480) email (audrey.lyndon@ucsf.edu), **or returning this form in the stamped self-addressed envelope;** or you may wait for Ms. Lyndon to contact you in about a month.

If you **do not** wish to participate, please return this form to Ms. Lyndon within the next three weeks and she will remove your name from her study list.

Yes, I am interested in participating:

Name:_____

Phone:_____

Email:_____

Best time to call:_____

Prefer to be contacted by
☐ phone ☐ email

No thank you - I am not interested in participating in the study *Exploring the Nurse's Role in Perinatal Patient Safety.*

Name:_____
(Please print clearly. Thank You!)

Hospital:_____

Please return this form in the stamped self addressed envelope to:
Audrey Lyndon, RNC, MS, CNS, **3255 Monterey Blvd, Oakland, CA 94602.**

Thank you so much for your valuable time!

PtSateyNominationLetterFormA-3: 6-12-06

RN Participant #_____

Exploring the Nurse's Role in Perinatal Patient Safety
RN Interview Guide

PI: Kathryn A. Lee, PhD, RN
Co-PI: Audrey Lyndon, RNC, MS, CNS

Introduction: As you know, I am interested in your experiences taking care of complicated patients or patients in rapidly evolving situations, and how you work to prevent harm to patients. I am interested in learning about how you make decisions about patient care, and how you work together with other team members. I believe I can learn a lot from listening to your stories about patient care, and I want to thank you for sharing them with me. Please include anything that stands out in your mind – no story is "too small" to include in your answers.

Before we get into the main part of the interview, I'd like to ask you for some background information:

How long have you been an OB nurse?_____

How long have you worked in your present setting?_____

Did you work as a nurse somewhere else before that?_____

Working ☐ FT ☐ PT? What shift(s)?_____ ☐ 8 hr ☐ 12 hr

How old are you?_____ How would you describe your race/ethnicity?_____

1. Please describe your unit for me.

2. Could you tell me about what "keeping patients safe" means to you?

3. Tell me about a time when you felt care was unsafe.
    - Probe: How has this experience impacted or changed your practice?

4. Tell me about a time when something was going wrong for a patient and you needed to do something about it.
    - Probe: Many nurses have stories about recognizing what we might call "pre-emergencies," or situations where a patient might easily get into serious trouble without intervention. I'm wondering if you might have a story like that you could share with me.

5. What kinds of things do you do or say when you find yourself in situations like you've just described?
    - Probe: Can you think of a time when you were particularly effective at communicating your concern to the team? Tell me about that.

6. Tell me about the last time you had a difference of opinion with a patient's physician or midwife.
    - Probe: Could you describe the situation for me in detail?
    - Probe: Tell me about what was concerning you in that situation.
    - Probe: How did you handle that?

7. Have you been in a situation or situations where you knew something was wrong but were hesitant or afraid to speak up or do something about it? Tell me about that.
    - Probe: Have you been in situations where you were not able to get a physician or midwife to listen to your concerns about a patient? Tell me about that.
    - Probe: How has this experience impacted or changed your practice?

8. What do you think makes a nurse really good at managing complicated patients or rapidly changing patient status?

9. What do you think makes a nurse really good at getting their message across to the team?

10. What do you think makes complicated situations easier or harder to manage?
    - Probe: What do you think is most influential on your clinical decision-making?
    - Probe: What effect do you think the shift a person works on has? How so?
    - Probe: What effects do you think fatigue and shift rotation have on decision-making? Can you give an example?
    - Probe: What effect do you think the staff (nursing, CNM, and medical) who are on have on your clinical performance or decision-making?

11. What else would you like to share with me about this topic?

12. If I have further questions may I contact you in the future for clarification and/or further interviews? ☐ Y ☐ N

13. Would you be willing to have me come and shadow you at work to get some direct experience with how team members interact in your setting? ☐ Y ☐ N

14. Would you be willing to participate in a focus group with other study participants in the future? ☐ Y ☐ N

15. Are there any nurses that you think it would be good for me to talk with, and you would like to nominate for this study? ☐ Y ☐ N

Thank you so much for sharing your time and your expertise with me. I really appreciate it. Do you have any questions for me?

Exploring the Nurse's Role in Perinatal Patient Safety
CNM/MD Interview Guide

PI: Kathryn A. Lee, RN, PhD, FAAN
Co-PI: Audrey Lyndon, RNC, MS, CNS

Introduction: As you know, I am interested in your experiences working with nurses to take care of complicated patients or patients in rapidly evolving situations, and how nurses work with you to prevent harm to patients. I am intersted in learning about how physicians, nurses, and midwives make decisions about patient care, and how you work together with other team members. I believe I can learn a lot from listening to your stories about patient care, and I want to thank you for sharing them with me. Please include anything that stands out in your mind – no story is "too small" to include in your answers.

Before we get into the main part of the interview, I'd like to ask you for some background information:

How long have you been practicing as an OB or CNM?_____

How long have you worked in your present setting?_____

Have you practiced anywhere else?_____

What is your typical work and call schedule?_____

How old are you?_____ How would you describe your race/ethnicity?_____

1. Please describe the birth center unit for me.

2. Tell me about the situation that prompted you to volunteer for the study or nominate [nurse's name] for this study.

3. Could you tell me about what "keeping patients safe" means to you?

4. Tell me about a time when you felt care was unsafe.
    a. Probe: How has this experience impacted or changed your practice?

5. Has a nurse ever "saved" or "rescued' you from a bad clinical situation?
    - Probe: What did the nurse do that helped you see the situation differently?
    - Probe: Can you remember anything specific the nurse said or did to help you see what she saw?
    - Probe: What did the nurse do or say that caught your attention or convinced you?

6. Are there any situations you can think of where you didn't attend to what a nurse wanted from you, and you later regretted it?
    - Probe: What was different about that situation?
    - Probe: How has that experience influenced your practice?

7. Has a nurse ever challenged your plan for a patient? Tell me about that.

8. How hard or easy do you think it is for a nurse to disagree with you about a patient's condition or your plan for a patient?
    - Probe: How important do you think it is for a nurse to speak up about his or her concerns?

9. What do you think makes a nurse really good at getting their message across to the team?

10. What do you think makes a nurse really good at managing complicated patients or rapidly changing patient status?

11. What do you think makes rapidly changing situations easier or harder to manage?
    - Probe: What do you think is most influential on your clinical decision-making?
    - Probe: What effect do you think your call status or how tired you are has on your decision-making? Can you give an example?
    - Probe: What effects do you think the work group or the shift have your clinical performance or decision-making? How so?

12. What else would you like to share with me about this topic?

13. If I have further questions may I contact you in the future for clarification and/or further interviews? ☐ Y ☐ N

14. Would you be willing to have me come and shadow you at work to get some direct experience with how team members interact in your setting? ☐ Y ☐ N

15. Would you be willing to participate in a focus group with other study participants in the future? ☐ Y ☐ N

16. Are there any other clinicians that you think it would be good for me to talk with, and you would like to nominate for this study? ☐ Y ☐ N

Thank you so much for sharing your time and your expertise with me. I really appreciate it. Do you have any questions for me?

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Thank you in advance for your time and consideration of this request.

Audrey Lyndon

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