# PEDIATRIC NURSES' JOURNEYS TO RELIEVE CHILDREN'S POST-OPERATIVE PAIN

by

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ABSTRACT

PEDIATRIC NURSES' JOURNEYS OF CARING TO RELIEVE CHILDREN'S POST-OPERATIVE PAIN

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This study sought to bridge the gap of nurses' knowledge of pain management and translation into clinical practice by describing pediatric nurses' negotiation of the bureaucracy of caring. The purpose of this study was to describe factors that influenced pediatric nurses' actions to relieve children's acute post-operative pain on a pediatric post-surgical care unit. The bureaucracy of caring provided the theoretical framework. A qualitative descriptive study of human factors engineering and ethnography was used to quantify the impact of influential variables on time from assessment to intervention.

Few knowledge deficits were identified; but nurses' general knowledge and attitudes regarding pain management were not barriers to controlling pediatric patients' post-surgical pains. Patients had good pain control. Results were consistent with the pain management goals of the organization and the nurses' goals that their patients be as comfortable as possible. Unlike previous studies that focused on the amount of analgesics administered to conclude that children were untreated or undertreated for pain, outcome conclusions of this study were drawn from observation of what nurses do in caring for children in pain. Nurses empowered with PRN

analgesic orders gave analgesics on a scheduled basis to prevent and treat children's post-surgical pain. Parents influenced pediatric post-operative pain assessment and management.

The few patients who had challenging pain experienced pains beyond the patients' and nurses' expectations. These patients had previous experiences with pain from hospitalization and surgery or analgesic side effects. Patients cried, parents' requested analgesics, and/or the patients' pain scores remained of moderate intensity on reassessment despite interventions. Movement and anxiety, as well as, poor communication among the medical staff were contributing factors. These results suggest that individual patients' experiences rather than the organizational culture may influence suboptimal pain management. Yet, nurses waited to notify prescribers of patients' continued pain until prescriber's made patient care rounds. This may reflect the organizational culture, the political dimension, and nurses' failure to effectively negotiate this bureaucracy of caring. To understand factors that contribute to suboptimal pediatric pain management, failure to escalate concerns to prescribers and the hierarchal roles of the political dimension of caring requires further investigation.

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# INTRODUCTION

Nurses are pivotal to the optimal management of pain in hospitalized children and much of the research on efficacy of postoperative pain management has focused on nurses' knowledge and attitudes related to pain and nurses' perceived barriers to achieving effective pain relief (Ely, 2001; Manworren, 2000; Rieman & Gordon, 2007; Vincent, 2005; Vincent & Denyes, 2004). While trends indicate improvements in care as knowledge, awareness, accountability, and regulatory requirements motivate healthcare providers and systems to relieve pain, children hospitalized after surgery continue to experience moderate to severe pain (Broome & Huth, 2003; Crandall, Kools, Miaskowski, & Savedra, 2002 & 2007; Griffin, Polit, Byrne, 2007, 2008; Joint Commission on Accreditation of Healthcare Organizations, 2001; Kleiber, Suwanraj, Dolan, Berg, & Kleese, 2007; Pop, Manworren, & Guzetta, 2007; Slaughter, Pasero, & Manworren, 2002; Vincent; Vincent & Denyes).

Pain management continues to be sub-optimal (American Academy of Pediatrics [AAP] & American Pain Society [APS, 2001]; Cheng, Foster & Hester, 2003; Hamers, Abu-Saad, van den Hout, & Halfens, 1998; Kleiber et al., 2007; Twycross, 2007a&b; Vincent, 2005; Vincent & Denyes, 2004) and suggests that inquiry needs to be expanded to factors beyond nurses' knowledge and attitudes (Vincent; Vincent & Denyes). To understand factors that contribute to the continued suboptimal management of pain in children requires a shift in focus from what nurses know (knowledge and beliefs) to what nurses do in the course of caring for a child in pain. What structures and processes do nurses negotiate in their efforts to assess and manage children's pain (Twycross, 2007a&b)? What influence does the bureaucracy and culture of the care environment have on nurses' effectiveness in negotiating optimal pain management? By identifying variables that encourage and hinder or deter nurses from effectively managing children's postoperative pain in clinical practice, further efforts to improve pediatric postoperative pain management can focus on enhancing or controlling these identified variables (Vincent; Vincent & Denyes).

## 1.1 Background and Significance

Pain is common in healthcare and the most frequently used nursing diagnosis (AAP & APS, 2001; Cheng et al., 2003). "Pain is a warning. It alerts us to injury and illness. Once a family has heeded this warning by seeking healthcare services for their child in pain, it is our obligation as healthcare providers to relieve and prevent further pain" (Manworren, 2002).

Aggregate data from 22 children's hospitals indicate that over 24,000 children per month have surgery at these facilities (Children's Healthcare Corporation of America [CHCA], 2004). One third of these children require hospitalization for the procedures. Over 3.1 million children under 18 years of age were hospitalized in 2001 (National Center for Health Statistics, 2003). Estimates indicate that up to 93% of children experience pain during their hospitalization (Huth & Moore, 1998); and up to 81% report moderate to severe pain after surgery (Huth, Broome, Mussatto, & Morgan, 2003; Polkki, Pietila, Vehvilainen-Julkunen, 2003).

Regulatory agencies now require pain assessment and management for all patients to preserve the individual's right to optimal pain relief (Joint Commission on Accreditation of Healthcare Organizations, 2001). Yet, pediatric nurses do not consistently assess children with developmentally appropriate, valid and reliable pain intensity scales (Broome & Huth, 2003). Documentation of pain assessments is infrequent and inconsistent (Ellis et al., 2007; Jordan-Marsh et al., 2004). Patient, family, nurse and physician communication regarding pain may be incomplete and ineffective (Griffie, 2003; Van Niekerk & Martin, 2003). Physicians tend to order pain medications to be given on an as-needed basis (Hamers et al., 1998; Vincent, 2005; Vincent & Denyes, 2004). Nurses empowered with analgesic prescriptions ordered as–needed, tend to undermedicate by administering dosages less often than prescribed (Hamers, et al.; Broome & Huth, 2003; Vincent, 2001; Vincent, 2005; Vincent & Denyes, 2004; Wiroonpanich, & Strickland, 2004). Nurses may be choosing ineffective, untested and unproven non-pharmacologic methods instead of pain medications rather than in addition to analgesics for treating children's pain (McCaffery, 2002).

Assessments of nurses' knowledge, attitudes and beliefs have failed to completely explain forces that promote or deter nurses from intervening to relieve children's acute pain. Research reveals inconsistencies between nurses' knowledge and attitudes regarding pain management and actual clinical practice (Dihle, Bjolseth & Helseth, 2006; Ellis et al., 2007; Watt-Watson, Stevens, & Garfinkel, Streiner & Gallop, 2001; Vincent, 2005; Vincent & Denyes, 2004). Several factors such as education level, age, years of experience, personal experience with opioids, and the nurses' ability to overcome barriers have been investigated as influencing pain management decisions. (Ely, 2001; Manworren, 2000; Pud, 2004; Reiman & Gordon, 2007). However, pediatric nurses' clinical practice may also reflect the political and cultural climate and structure of individual healthcare institutions (Berry & Dahl, 2000; Jordan-Marsh et al., 2004; Pasero, Gordon, McCaffery & Ferrell, 1999). Therefore, pain management errors may also be a reflection of nurses' failure to effectively negotiate the bureaucracy of caring. Few studies have explored the complexity of interacting variables that promote or deter nurses from advocating and negotiating the bureaucracy of caring to achieve optimal pain management for hospitalized children experiencing acute pain (Christenson, 2000; Jordan-Marsh et al., 2004; Twycross, 2007a&b; Vincent, 2005; Vincent & Denyes, 2004).

## 1.2 Theoretical Perspective

To examine the bureaucratic structures, processes and cultural/environmental variables that nurses negotiate in managing pain among children, Ray's Theory of Bureaucratic Caring is used to provide the theoretical perspective (Figure 1.1) for this study.


Figure 1.1: Ray's Theory of Bureaucratic Caring

Ray (1989) explains the work of nurses in clinical practice and factors that effect performance outcomes in The Theory of Bureaucratic Caring. The focus is the goal of caring. Caring is centered in the diagram, emphasizing the convergent focus on the provision of care in nursing. The differential aspects of care are illustrated by the concentric depiction of equally spaced care dimensions. Bureaucratic caring is defined in terms of seven structural caring dimensions of organizations. These dimensions can be classified into two domains, the bureaucratic and the humanistic dimensions.

The bureaucratic dimensions are political, technologic/physiological, economic, and legal. Political aspects of care includes role stratification and division of labor, power, decision making, communication patterns, regulatory and payor influences, competition and distribution of resources within an organization (Ray, 1989). Technologic/physiological aspects of care are identified as the knowledge and skill to operate and use equipment to maintain the physiological functions of the patient. Economic aspects of care involve the allocation of resources to provide care while maintaining the viability of the system. Legal aspects of care include responsibility, accountability, liability, rights, rules and guiding principles of behavior.

The humanistic dimensions are spiritual/religious, social/cultural and educational. Spiritual/religious aspects of care include acts of faith, empowerment, creativity, choice, hope, and brotherly love. Social aspects of care include communication, compassion, concern, involvement, intimacy, love and empathy in caring. Respect and trust in providing care involves adhering to culturally defined standards of moral behavior. Educational aspects of care consist of educational programs, information and teaching.

The interplay dynamics of the care dimensions is represented by the arrows towards or away from care. The Theory of Bureaucratic Caring illustrates the interplay of organizational forces and barriers and their effect on nursing's ability to facilitate choice and achieve caring. Research that focuses on clinical problems and clinical practices may provide further support and definition for the dimensions of caring described in this theory.

The Hegelian dialectic provides a process for examining the provision of acute pediatric pain management within the framework of the Theory of Bureaucratic Caring (Ray, 1989). For example, even with increased availability of pediatric pain management information - *thesis*, person's seeking knowledge obtain tacit knowledge immersed in a matrix of presuppositories of professional and general culture - *antithesis*, operationalizing this information into practice regulated by a bureaucracy of caring - *synthesis* (Ray, 1999).

In an effort to understand factors nurses negotiate in their work of assessing and managing pediatric postsurgical pain, Ray's model of Bureaucratic Caring was adapted (Figure 1.2). Ray's constructs are defined based on the literature review and a pilot study to identify potential variables for exploring pediatric nurses' postsurgical pain management practices. But the emphasis of this study is to identify variables and perhaps verify these variables, so this adapted model will be incomplete until study results are reported.

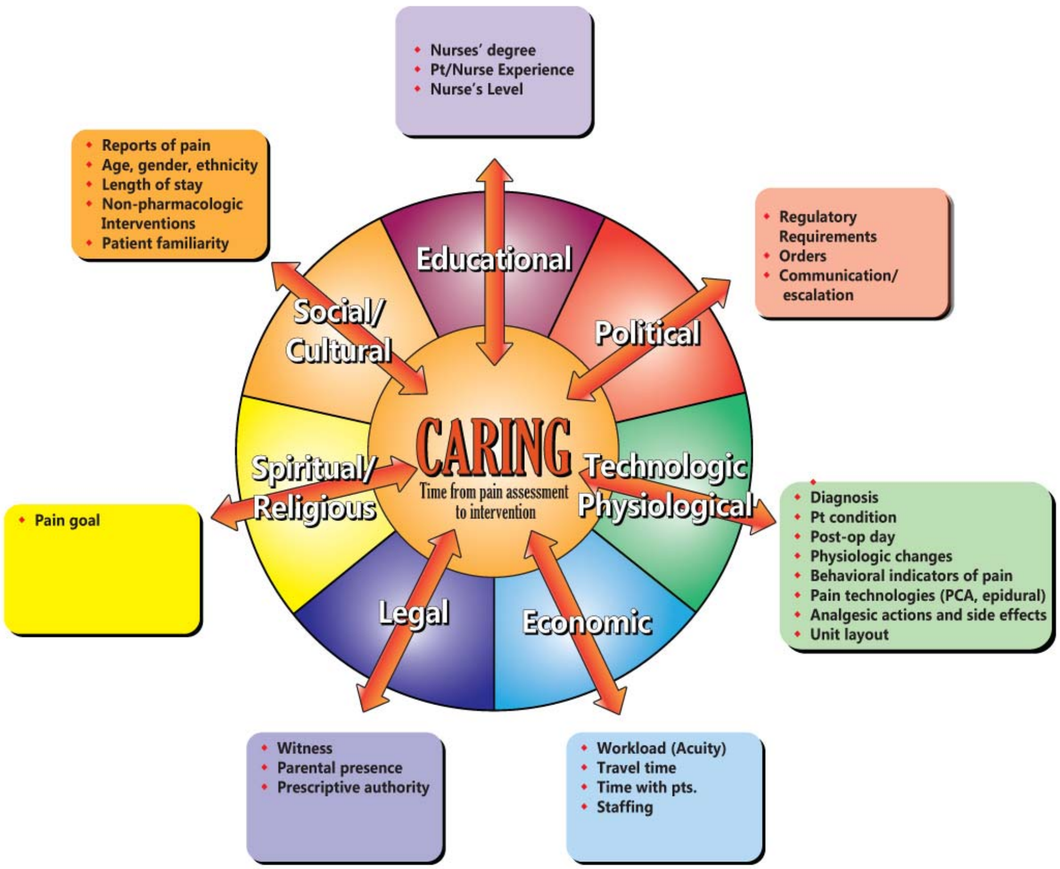


Figure 1.2: Conceptual Model (Adaptation of Ray's Theory of Bureaucratic Caring)

*1.2.1 Operational definition of caring*

Caring for children in pain has been operationalized as time from pain assessment to intervention. Based on the pilot study and literature review, time of pain assessment is defined as any information that alerts the nurse the patient is experiencing pain such as, but not limited to, a request from the patient or parent for an analgesic, a patient's self-report pain intensity score, or behavioral indicators of pain. The interventions of interest are the administration of pro re nata (PRN), as-needed, analgesics and nurse's use of biobehavioral (non-pharmacologic) strategies. The use and timing of these particular pain management interventions is within the purview of nursing clinical practice and clinical judgment, but timely implementation of these interventions may be influenced by other aspects of bureaucratic caring.

During the pilot study observations, pain was also treated with scheduled analgesics, epidural medications and patient controlled analgesia (PCA). Preliminary data analysis suggests that while these pharmacologic interventions require nurses' clinical judgment, time to analgesic administration for these interventions may be overly influenced by isolated and dissimilar factors. Examples of these factors are the timetable for scheduled analgesics; the prescribed rate of infusion and placement of the epidural catheter; and the patient's understanding of the device for the PCA.

Pain was also typically treated with PRN analgesics, arming nurses with choices for the care of patients. However, preliminary analysis of pilot study observations suggests that some nurses use biobehavioral techniques rather than analgesics as initial pain management interventions. When these interventions resulted in pain control that was acceptable to the nurse, patient, or parent, analgesic administration became an unnecessary intervention. When these biobehavioral interventions did not achieve appreciable pain reduction or relief, some nurses administered analgesics as a secondary intervention. The reverse order of interventions was also observed. There were times when pain medications were administered and biobehavioral interventions were initiated to supplement analgesia. At other times it was unclear whether repositioning the patient was a biobehavioral intervention to reduce pain or merely a timed nursing task.

The pilot study identified nurses' use of biobehavioral interventions and their timing in relation to analgesic administration as a factor that clearly influenced time from pain assessment to intervention. Table 1.1 includes a portion of pilot data that clarifies how use of biobehavioral interventions and their timing in relation to analgesic administration is an influencing factor. The first patient is assessed for pain at 10:41:11 and a biobehavioral intervention (B), releasing traction, is provided within 30 seconds of the assessment. This intervention is followed by a secondary pharmacologic intervention (P) at 10:52:01, 10 minutes and 50 seconds after the pain assessment.

Table 1.1: Pain Assessment to Intervention Interval Sample (Pilot Study, P= pharmacologic intervention, B= biobehavioral intervention, 0= No witness or previous intervention, x=not applicable)

| Pt and interval number | Interven-tion time | Assess-ment time | Time interval | Pain Score or assessment | Pharm or biobe-havioral | Witness | Previous Pharm or biobe-havioral | Previous Pharm or biobe-havioral |
|---|---|---|---|---|---|---|---|---|
| 1-1 | 10:41:41 | 10:41:11 | 0:00:30 | See comments | B, released traction | 0 | 0 | X |
| 1-2 | 10:52:01 | 10:41:11 | 0:10:50 | 0 | P | 1 | 1 | B |
| 2-1 | 2:53:49 | 1:56:33 | 0:57:16 | 0 then 2 | P | 0 | 0 | X |
| 2-2 | 5:00:07 | 3:38:04 | 1:22:03 | When moves | P | 0 | 1 | B |

The literature review suggests that the use of non-pharmacologic (biobehavioral) interventions is influenced by social/cultural aspects of care, a humanistic dimension of caring. Analgesics have been categorized in the opposing bureaucratic dimension of technologic/physiological aspects of care. The model, consistent with the literature review and pilot study observations, illustrate the interplay of analgesic use and biobehavioral interventions may delay or facilitate caring.

*1.2.2 Potential bureaucratic variables*

Political aspects may include the power to prescribe, administer, request, or refuse pain relieving interventions. In addition, decision making, communication, and escalation, may be factors that influence the ability to provide optimal pain control. An example from the pilot study illustrates delays that categorize this dimension of caring.

Almost 6 hours into a night shift (approximately 1AM), the nurse asks the patient's mother if she wants the nurse to call the doctor for a medication usually given at home for gas pains.

> The mom asks the patient if they should have the nurse call the doctor and the patient replies “yah.” The nurse checks the patient’s chart and points out a previous one time order for the gas pain medication. She comments “he doesn’t order anything PRN, he likes to be called.” The nurse informs the charge nurse that she is going to make the call; but before she calls the doctor, the charge nurse asks if any other nurse needs to talk to this particular doctor. Eleven minutes later the nurse informs the patient and mother that she has called the doctor and is waiting for a call back. The nurse returns to the nurses’ station 2 minutes later and asks “did he call back?” Another nurse states, “give him 5 more minutes, besides you know we always have to page him twice.” One hour later the nurse calls the doctor’s home and obtains the order. She comments to the researcher “he said he was about to call.”

Current political threats to optimal pain control also include regulatory requirements for guidelines, which direct nurses’ interpretation of range orders and administration of analgesics when given multiple choices (Manworren, 2006).

Appropriate use of technology and pain assessment tools to optimize pain control and monitor the patient’s response to analgesics fits the technologic/physiological dimension of care. Physical aspects of care must also address the difficulty in identifying pain intensity through behavior and objective data alone, as well as the potential to increase or decrease pain through physical contact with the patient in the provision of care. For example consider this physical interaction from the pilot study:

> Patient states, "Ow, my leg." Nurse responds, "Take deep breaths." Patient cries out as being repositioned by nurse and his mother, "Ow, ow, ow." Nurse asks, "What's hurting?" Mom replies, "I think it’s his hiney” (Mom wiping patient’s buttocks). Patient again cries out, "Owie, Owie, Ow." Nurse again asks, "What is it?" Patient replies, "I don't know, Ow.” Mom states, "Sorry." Patient requests, "I want to get back on my back." The nurse and patient’s mother repositioned him on his back with legs on pillows. The nurse assesses, "are you

hurting or just didn't like us doing that stuff." Patient clarifies, "I didn't like you doing that stuff." The nurse asks, "but, okay now?" Patient replies, "Yes."

The literature suggests that the nurse's question in this example, "are you hurting or just didn't like us doing that stuff," may reflect her knowledge of the patient's diagnosis, condition and post-operative day. These technologic/physiological variables influenced nurses' actions in studies reviewed and may influence time from pain assessment to intervention.

Another technologic/physiological dimension of care identified in the pilot study is the physical layout of the care unit. Disbursement of nurses' patient care assignments influenced nurses' travel times, and thus influenced time from pain assessment to intervention (51 minutes 50 seconds, Table 1.2). While unit layout has been categorized as a technologic/physiological variable, travel time has been categorized as an economic variable.

Table 1.2: Thursday Night Time in Nursing Processes (Pilot study)

| **Nursing Process** | **X** | **Total** | **AVE** | **MIN** | **MAX** |
|---|---|---|---|---|---|
| Documentation | 33 | 3:59:27 | 7:15 | 0:04 | 58:46 |
| Assessment | 44 | 2:52:40 | 3:55 | 0:18 | 27:12 |
| Plan | 17 | 1:05:58 | 3:52 | 0:30 | 20:00 |
| Handoff | 11 | 59:14 | 5:24 | 0:40 | 26:00 |
| Miscellaneous | 14 | 57:07 | 4:05 | 0:21 | 19:27 |
| Medication Administration | 32 | 52:14 | 1:37 | 0:07 | 5:36 |
| Travel | 109 | 51:50 | 0:29 | 0:03 | 02:10 |
| Intervention | 9 | 33:45 | 3:45 | 0:59 | 13:14 |
| Break | 6 | 32:26 | 5:24 | 1:46 | 14:39 |
| Educate | 9 | 24:43 | 2:45 | 0:18 | 7:03 |
| Gather | 23 | 14:45 | 0:38 | 0:08 | 1:57 |
| Interruption | 7 | 13:06 | 1:52 | 0:16 | 5:20 |
| Check, Delay& Delegate | 7 | 10:12 | 1:27 | 0:31 | 5:23 |
| **Total** | **345** | **13:50:40** | | | |

The economic dimension of bureaucratic care emphasizes workload and staffing. Staffing and nursing workload determine direct care time and therefore influence the cost of care. These may be factors that influence nurses' responsiveness to children's acute postoperative pain.

Legal aspects as defined by the literature review may include prescriptive authority and limitations, patients' rights to pain management, guardian and nursing responsibility for pain control, accountability for opioid administration, and the administration of appropriate analgesics and therapies versus potential liability for analgesic side effects and inadequate resolution of pain. Consider the burden of witnessing and dispensing controlled substances, as well as concerns regarding drug diversion. This pilot data shows that the regulatory or organizational requirement to witness certain analgesics is an influencing factor (See Patient 1, Interval 2, Table 1.1). The secondary pharmacologic intervention (coded with a 1 in the witness column) indicates that a second nurse, witness, was required to access this analgesic, which contributed to the approximately 11 minute time interval.

#### *1.2.3 Potential humanistic variables*

Spiritual/religious aspects of pediatric pain management may include hope for complete pain relief. Ray's definition of this dimension also suggests that assurance, empathy, and brotherly love in preventing the pain of another are spiritual/religious aspects of care. The literature, however, indicates that nurses who chose the goal of pain relief were more likely to provide, in vignette situations, more analgesics than nurses who did not express pain relief as their pain management goal (Burokas, 1985). This goal was the single most important factor affecting pediatric nurse's analgesic administration. More research is needed to investigate how nurses' goals for pain management influence their clinical actions and pain management interventions.

Social/cultural aspects may include empowering the child to articulate his/her pain and pain relief experience. Cultural expression and expectation of pain and pain management must be explored. As previously described, choice in method of pain control, such as pharmacologic or biobehavioral interventions as primary pain relief strategies are also social/cultural aspects of the humanistic care dimension. This researcher speculated that effectiveness of initial pain management interventions implemented during a nurse's shift or even nurse's efforts caring for the same patient during previous shifts may influence the type and timing of subsequent interventions. Therefore, during the pilot study, the researcher asked whether the nurse had previously cared for the same patient to determine the potential social influence of familiarity. Preliminary analysis reveals that some nurses anticipate patients' pain from previous care experiences with the patient and by reviewing charts and medication administration records prior to the start of their shift. Length of stay may influence the nurses' familiarity with the patient and certainly impacts the time it would take for a nurse to review the patient's medical record.

Educational aspects of acute pediatric pain management requires an understanding and ability to educate others regarding appropriate knowledge and attitudes to achieve pain control, such as resolving concerns about addiction to analgesics or the need to be strong in times of adversity. Knowledge of patients, families, nurses, and clinicians should reflect the state of the science and the art of caring. The literature suggests that nurses who are better educated, with more clinical experience, or have had personal experience with pain are more skilled in making optimal pain management decisions for their pediatric patients. Results of the influence of nurses' characteristics on nurses' pain assessment and management decisions, however, are inconsistent across studies.

*1.2.4 The interplay of bureaucratic and humanistic dimensions of caring*

The seven dimensions of bureaucratic caring are all complex aspects of the nursing care required to manage acute pediatric pain. Each dimension of care presents a potential impetus or conflict to achieving the care goal. For example, how does the nurse choose to negotiate the legal dimension when the analgesic is a controlled substance with additional legal requirements to be met prior to administration? Does the nurse choose administration of the controlled substance or choose instead to medicate the child with another analgesic with less stringent administration requirements? Perhaps the nurse chooses to use a biobehavioral intervention instead because a legal prescription for an analgesic is not available? Does the liability for poor pain control influence the nurse's choice? Does the nurse's educational level encourage or deter the nurse from administering a controlled substance or biobehavioral intervention for pediatric acute pain management? What are the economic implications of this care choice?

What are the care costs of requiring two nurses to witness the administration of a controlled substance to meet legal dimensions of care? Would it be less expensive for the nurse to provide a biobehavioral intervention, or would the time required for such an intervention make it cost prohibitive?

Each dimension of care plays a part in the whole. The whole is not merely the sum of the parts. While isolating specific dimensions of care in this framework provides a more manageable structure for quantitative investigation, the results will be merely a limited approximation of the complex factors that effect nurses' choices in the provision of pain management to children in acute pain. Nurses act and react to assessments, care planning, interventions, and evaluations; however, nursing reactions are not the effect of actions, but instead are the result of complex personal and system interactions. Thus, the strength of this theoretical model and study framework is the identification of care decisions within a complex system of conflicting priorities. The nurse is recognized as the negotiator of the bureaucracy of caring who facilitates and modulates care decisions to focus on care outcomes.

Exploring the interplay of bureaucratic (political, technologic/physiological, economic, legal) and humanistic (spiritual/religious, social/cultural, educational) dimensions of caring in a clinical setting will provide insight into pediatric nurses' clinical pain management practices. Specifically, by describing the outcome of pain control and how the seven care dimensions influence nurses' decisions to treat hospitalized children for pain after surgery there will be a better understanding of the influences of pediatric nurses' current clinical pain management practices.

## 1.3 Purpose

Pain is complex having physical, sensory, affective, emotional, cognitive, and behavioral components that are interrelated with environmental, developmental, sociocultural, spiritual and contextual factors (AAP & APS, 2001; Cheng et al., 2003). Caring for the child in pain requires intervening to relieve or reduce the child's pain. In order to describe what influences nurses' decisions in efforts to relieve children’s pain, aspects of care within an organization and general culture need to be investigated.

The purpose of this study is to describe factors that promote and hinder or deter nurses’ actions to relieve children’s acute post-operative pain on a pediatric post-surgical care unit. The primary outcome of interest in this study is time from pain assessment to pain intervention. Time of pain assessment is defined as any information that alerts the nurse the patient is experiencing pain such as, but not limited to, a request from the patient or parent for an analgesic, a patient’s self-report pain intensity score, or behavioral indicators of pain. When pain is treated with PRN analgesics and biobehavioral techniques, nurses are empowered to use clinical judgment in determining intervention type, time, and dose. Timely implementation of these interventions may be influenced by other aspects of Bureaucratic Caring. In an effort to capture the most explicit data regarding nurses’ critical thinking and clinical judgment as they negotiate aspects of care within their organization, pain interventions of interest for this study will be limited to the administration of PRN, as-needed, analgesics and biobehavioral (non-pharmacologic) interventions. Nurses’ use of biobehavioral interventions and their timing in relation to analgesic administration will also be described.

In this study, qualitative observational and interview data will be used to identify factors that influence time from pain assessment to intervention to relieve children’s acute post-operative pain on a pediatric post-surgical care unit. These influencing factors will be described and categorized according to Ray’s Theory of Bureaucratic Caring. The results will contribute to our understanding of how nurses negotiate the complexities of the bureaucracy of caring. By identifying factors that encourage or hinder/deter nurses from effectively managing children’s postoperative pain in clinical practice, further efforts to improve pediatric postoperative pain management can focus on enhancing or controlling these identified variables (Vincent, 2005; Vincent & Denyes, 2004).

## 1.4 Study Questions

Using a qualitative, descriptive study of human factors engineering and ethnography, this study explores how pediatric nurses negotiate the bureaucracy of caring to relieve children's acute post-operative pain on a pediatric post-surgical care unit. This study will:

Aim #1: Describe pediatric nurses' actions to assess and manage children's acute post-operative pain on a pediatric post-surgical unit with PRN, as-needed, analgesics and biobehavioral (non-pharmacologic) interventions.

Aim #2: Categorize factors observed to influence pediatric nurses' abilities to care for patients using the seven dimensions of bureaucratic caring: (1) political, (2) technologic/physiological, (3) economic, (4) legal, (5) spiritual/religious, (6) social/cultural, and (7) educational.

Aim #3: Describe the specific care dimensions as they relate to acute pain management and how nurses negotiate these dimensions of caring to relieve acute post-operative pain for patients on a pediatric post-surgical unit setting.

Aim #4: Evaluate the interplay of care dimensions and their influence on time of pain assessment to intervention.

## 1.5 Assumptions

It is assumed that:

- Pediatric patients hospitalized on the post-surgical unit are at a high risk for pain after surgery.
- Nurses on the pediatric post-surgical unit will place a high priority on pain assessment and management.
- Developmentally appropriate pain assessment tools will be available for nurses' use on the post-surgical unit.
- PRN analgesics will be ordered and available as interventions for pain management.
- Observation of nurses for a prolonged period of time (entire shift) will counter any changes of behavior prompted by the presence of a nurse observer.

## 1.6 Summary

Children hospitalized after surgery continue to experience moderate to severe pain. Research has focused on nurses' knowledge and attitudes related to pain and nurses' perceived barriers to achieving effective pain relief. An observational study that captures interactions within the social system of healthcare is required to identify actual variables that influence nurses' effectiveness in managing children's postoperative pain. An adaptation of Ray's Theory of Bureaucratic Caring provides a model for evaluating the forces and barriers nurses negotiate to provide pediatric pain management within an acute care hospital setting. The complex political, technologic/physiological, economic, legal, spiritual/religious, social/cultural and educational aspects of care are all dimensions of the Theory of Bureaucratic Caring, which present potential impetus or conflict to achieving the care goal – pain reduction or relief. By identifying variables that encourage and hinder or deter nurses from effectively managing children's pain in clinical practice, further efforts to improve pediatric postoperative pain management can focus on enhancing or controlling these identified variables.

# CHAPTER 2

# CRITICAL REVIEW OF RELEVANT LITERATURE

## 2.1 Acute Pain in Children

Pain is a common adverse stimulus and the most frequently used nursing diagnosis (AAP & APS, 2001; Cheng, Foster, & Hester, 2003). Pain is defined by the International Association of the Study of Pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (Merskey & Bogduk, 1994, p. 209-211). The AAP and the APS emphasize the subjective nature of pain (AAP & APS; APS, 2009). As does the classic nursing definition, “Pain is whatever the experiencing person says it is, existing whenever he says it does” (McCaffery, 1968, p. 11). Unfortunately, this definition has limited utility for preverbal and non-verbal children who are unable to communicate their pain experience in a standardized subjective manner (APS; Hunt, Mastroyannopoulou, Goldman & Seers, 2003; Manworren, 2003).

Pain is a complex phenomenon that involves physical, sensory, affective, emotional, cognitive, and behavioral components that are interrelated with environmental, developmental, sociocultural, spiritual and contextual factors, which affect how pain is perceived, managed and evaluated (AAP & APS, 2001; Cheng et al., 2003). Acute pain results from mechanical, thermal, or chemical trauma to tissues and generally disappears as injuries heal (APS, 2009; Edwards, 2002). Unrelieved pain may prevent wound healing, delay recovery, prolong hospitalization and lead to developmental regression, increased morbidity and death (Franck, Greenberg, & Stevens. 2000; Vincent & Denyes, 2004).

## 2.2 Children's Pain is Untreated or Undertreated

Hospitalized children experience acute pain from surgical procedures, trauma, illnesses and medical procedures (AAP & APS, 2001; Anghelescu & Oakes, 2002). Research indicates that pain experienced by hospitalized children is undertreated (AAP & APS; Boughton, et al., 1998; Ellis et al., 2002; Hamers et al., 1998; Huth et al., 2003; Vincent, 2005; Vincent & Denyes, 2004). Early studies reached this conclusion by either describing a lack of analgesic administration to children for painful conditions or an inequity of analgesic administration to children as compared to adults after similar surgical procedures (Beyer, DeGood, Ashley & Russell, 1983; Burokas, 1985; Eland & Anderson, 1977; Elander et al., 1991; Elander & Hellstrom, 1992; Foster & Hester, 1990; Schechter, Allan & Hanson, 1986; Swafford & Allan, 1968). They reached their conclusion that children were untreated or undertreated for pain by focusing on the amount of analgesics administered rather than the relief of children's post-surgical pain (Hamers, et al.).

## 2.3 Nurses Role in Post-operative Pain Management

Most of our knowledge regarding nurses' role in managing children's pain and barriers to effective pain management has come from surveys, retrospective chart reviews and interviews. These methods are surrogate strategies that have been used to inform our understanding of potential influences on nurses' pain management practices and fail to identify actual and contextual issues that may impact nurses' clinical practice. In addition, interviews alone may result in discrepancies between self-reported actions and actual clinical practice (Dihle et al., 2006). Thus, qualitative researchers have emphasized the utility of observation to examine the complexities surrounding nurse-patient interactions and potential contextual influences impacting nurses' assessment and management of postoperative pain (Brown & McCormack, 2006; Byrne, Morton, & Salmon, 2001; Clabo, 2008; Manias, Botti, & Bucknall, 2002, 2005; Twycross, 2004; Woodgate & Kristjanson, 1996a). Their results demonstrate that observational methods provide a means to identify enabling and hindering issues that influence how nurses manage pain and the complex interplay of nurses' many care tasks.

In this section, observational studies of postsurgical pain management will be reviewed. Few pediatric studies were identified in the literature; therefore the literature review was expanded to include observational studies regarding managing adult patient's pain after surgery. Results from these studies and their implications for future study of pediatric postsurgical pain management will be presented. Observational studies of postsurgical pain management focused on nurse-patient interactions, providing just a glimpse of the complexities of nurses' workload on a postsurgical ward. In an effort to ascertain the potential influence of organizational and workflow issues on pediatric postsurgical pain management and inform study design, select time motion studies will also be reviewed in this section.

*2.3.1 Observational studies of pediatric postsurgical pain management*

Only six publications of observational studies investigating nurses' role in pediatric postsurgical pain management were identified (Byrne, et al., 2001; Twycross, 2002, 2007a, 2007b, 2008; Woodgate & Kristjanson, 1996a). None of these studies were conducted in the United States. In the earliest study, Woodgate and Kristjanson (1996a) interviewed and observed 11 children, 2 to 6 years of age on a pediatric surgical unit, to describe how parents and nurses respond to young children's post-operative pain. This study was a natural extension of Woodgate and Kristjanson's previous qualitative works investigating young children's communication and experience with acute pain (1996b). Although the major theme that emerged to describe how parents and nurses affect the young children's pain experiences was "*take care*," the manner in which parents and nurses achieve this role differed, suggesting organizational and professional culture implications.

Parents provided comfort measures and vigilantly monitored their children's pain (Woodgate & Kristjanson, 1996a). Whereas nurses used limited means to **assess pain;** relying mainly on parental reports, providing technical care but unable to adequately relieve children's pain. Communication between parents and nurses regarding pain were typically limited to whether the child was hurting and when the **last analgesic was administered**. This is consistent with the assumption that the workload of pediatric nurses places an increased responsibility on parents for monitoring their children during hospitalization (Huth et al., 2003). Nurses had difficulty articulating how they knew a child was in pain or verbalizing the uniqueness of each child's pain behaviors, instead referring to their lack of experience in caring for particular patients, "I haven't taken care of him" (Woodgate & Kristjanson, 1996a, p. 277). More recently published results of semi-structured interviews with 21 nurses working in one pediatric department in a middle-sized hospital in Sweden provide evidence that cooperation with parents as well as the nurse's relationship or knowledge of the child in pain are still key factors that influence nurses' pain management practices (Gimbler-Berglund, Ljusegren, & Enskar, 2008). Nurses noted that lack of successful cooperation with parents resulted in delayed pain relief for pediatric patients.

**Nurse to nurse communication** regarding pain was general, relying on adjectives such as "fine" or "good" (Woodgate & Kristjanson, 1996a, p. 280). Value was placed by parents and nurses for children being "good" and tolerating or coping with more pain than other children who displayed more overt signs of pain (p. 278). Byrne, et al. (2001) also heard nurses value the importance of children not displaying distress after orthopedic surgery: "She's great. She doesn't even say when she's in pain" (p. 71). Pediatric orthopedic patients, aged 8 to 16 years, were followed daily from the second to the sixth day after surgery to observe patient-nurse communication related to pain. Sixteen patients and their parents (20 were available), were interviewed. The 13 primary nurses caring for the patients were interviewed or observed. This study further clarifies differences in pediatric nurses' and parents' meanings of assessments that the child is *doing well*. Like Woodgate and Kristjanson, (1996a), parents in this study considered their child to be doing well after orthopedic surgery when 'enduring' or 'coping with' pain. Whereas for nurses, doing well meant reaching **functional milestones**, staying on the

**expected schedule of recovery**, and not displaying **pain behaviors** regardless of whether the patient was in pain. Nurses attributed patients' displays of pain behaviors and distress as a result of dissimulating or anticipating pain rather than a true experience of pain. Nurses denied the legitimacy of pain behaviors, instead blaming **parental influence** or personality rather than pain. Nurses even indicated that patients did not deserve help for their pain behaviors and distress since they were malingering or complaining; "teen**age**rs are a pain any way" (Byrne et al., 2001, p. 72). Byrne, et al. (2001) concluded that nurses defend themselves emotionally against patients' pain, which compromises communication.

In Woodgate and Kristjanson's (1996a) study, nurses relied on their lack of **experience in caring for particular patients** as a rationale to explain why they could not articulate the **level of the child's pain**. While this suggests that organizational approaches, which are implemented to reduce clinician-patient distance, such as primary nursing, may be an important variable; Byrne, et al. (2001) warn that efforts to improve nurses' familiarity with patients may actually have the opposite effect due to nurses' need to emotionally defend themselves against their patients' pain. They also warn that organizational changes directed to professionalize and improve efficiency in postoperative pain management, such as patient-controlled analgesia, may also reduce clinicians' exposure to patients' pain.

**Time** seemed to be a significant barrier to nurses' effectiveness in assessing for pain (Woodgate & Kristjanson, 1996a). **Episodic pains**, such as bladder spasms, were often missed since nurses' time spent assessing children was brief and infrequent, which resulted in delays of analgesic administration. Nurses were observed providing opioid analgesics every 3 to 4 hours, but often children experienced pain again 2 hours later and nurses frequently did not **reassess** the patient to determine analgesic effectiveness. **Duration** of pain seemed to be more important to parents and nurses than **intensity of pain**. Nurses gave the majority of analgesics during the first 48 **hours after surgery** when they expected pain to be moderate to severe. Nurses expected pain to subside and appeared less concerned about managing mild and moderate pain. Nurses prioritized **incision pain over other “unusual pain”** (Woodgate & Kristjanson, 1996a, p. 278). The child’s **diagnosis** and **acuity** resulted in a perceived hierarchy of appropriateness for pain with more pain being expected among children who were more ill or had more visible injuries. Both parents and nurses had minimal **expectations of pain relief**. “You just can’t seem to control their pain. As nurses you’re trained to believe that you can keep the patient pain free, but well, that just doesn’t happen” especially with **required nursing activities;** “She’s alright until you turn her and then I’m the wicked witch” (Byrne et al., 2001, p. 73).

The complex therapeutic tasks and the technical aspects of nursing may compete with nurses’ work to provide comfort and care (Woodgate & Kristjanson, 1996a). Lack of time, lack of routines, and shortage of staff are described as obstacles in pain management, whereas resources, such as a pain management teams, are identified as facilitating pain relief (Gimbler-Berglund et al., 2008). In addition to recommending further pain assessment and management education for nurses and parents, Woodgate and Kristjanson, (1996a) recommend **organizational policies and protocols** that encourage nurses to be sensitive and effective in responding to children’s pain. Planning for pain management with better routines, organizational support and structure ensure there is time for pain management (Gimbler-Berglund et al., 2008). Based on their observations and conclusions, Byrne, et al. (2001) doubt the effectiveness of a cognitive approach for improving nurses’ sensitivity to patients’ pain, but instead recommend peer support or supervision as a means to reduce nurses’ use of protective mechanisms that act as a barrier to optimal pain management. One-on-one coaching has since been studied to determine if it would improve nurses’ knowledge and attitudes regarding children’s pain and nurses’ rates of pain assessment, analgesic administration, and use of non-pharmacological interventions during painful procedures (Johnston et al., 2007). Unfortunately, while nurses who were coached increased their rate of pain assessment documentation, they did not increase their rate of analgesic administration or documentation of non-pharmacologic comfort measures. Johnston, et al. (2007) identified the need to further investigate the organizational context, such as policies, decision-making processes, resources, prevailing organizational values and beliefs, teamwork, and leadership. Woodgate and Kristjanson, (1996a) also identified the need for further examination of how nurses integrate pediatric pain management into their daily care tasks, how nurses make pain management decisions, and what barriers prevent nurses from relieving children's pain.

Twycross' efforts to ascertain how pediatric nurses manage children's pain on a surgical ward have been detailed in four publications (2002, 2007a, 2007b, 2008). Twycross (2002, 2007a) emphasized the need to move from interviews and questionnaires, since responses may merely reflect social desirability, to observational studies of how nurses currently manage children's pain in clinical practice. A total of 13 pediatric nurses were observed for five hours per shift for two to four shifts each, resulting in over 175 hours of observations. Data were collected by structured observation using a clinical pain assessment tool, field notes, and audit of drug doses (2002, 2007a, 2007b, 2008). Twelve of the nurses completed a Pain Management Knowledge Test (2007b). Twelve of the nurses completed the Paediatric Pain Training Needs Questionnaire to determine how important nurses considered pain management tasks to be for four age groups of patients (2008). Content of field notes was analyzed to identify themes, determine whether pain management practices were consistent with clinical practice guidelines, and compare nurses' theoretical knowledge and perceived pain management priorities with their observed pain management practices (2002, 2007a, 2007b, 2008).

Nurses ranked obtaining a pain history, use of behavioral indicators, administration of analgesics, use of biobehavioral methods, reassessment, documentation, communicating with patients, communicating with involving parents, and seeking advice from the multidisciplinary team as moderately to highly critical for effective pain management (Twycross, 2008). However, nurses administered analgesics when children complained of pain rather than administering analgesics on a regular basis (2002; 2007a). Twycross also observed inconsistencies with other clinical practice guidelines, suggesting that nurses did not prioritize pain management in actual clinical practice (2002; 2008). Specifically, nurses did not (a) obtain a pain experience history routinely on admission, (b) use valid and reliable pain assessment tools consistently, (c) take into account behavioral or physiological indicators of pain (d) provide pre-emptive analgesia (e) use biobehavioral interventions for pain relief routinely, (f) involve parents in the assessment and management of their child's pain, (g) seek advice from the multi-disciplinary team regarding managing children's pain, (h) document pain assessments and interventions, (h) re-assess for effectiveness of pain management interventions, (i) talk to children and their parents about all aspects of pain management (2002, 2007a, 2007b, 2008). In her effort to link nurses' theoretical pain management knowledge to their clinical practice, Twycross (2007b) found that nurses' theoretical knowledge did not impact (1) nurses' analgesics practices (2) use of non-drug interventions (3) reassessment of pain or evaluation of intervention effectiveness (4) documentation, or (5) communication with the multidisciplinary team. This finding implies that gaps in knowledge do not provide a strong explanation for continued under-treatment of pain in children; rather the gap is between what nurses know and what nurses do. Twycross (2007a, 2008) suggests **professional socialization**, lack of **role models** to challenge the organizational culture toward pain management, and a lack of **prioritizing pain** management as explanations for these findings.

Observing nurses practice on a single unit provides evidence of poor pain management practices, but is insufficient for ascertaining whether these practices truly reflect a single ward's organizational culture or a more general professional culture of pediatric nursing (Twycross, 2007a, 2008). Through observation, Twycross documented how pediatric nurses actually manage pain; however, this method fails to ascertain how nurses make decisions related to acute pain assessment and management and what nurses were actually thinking about when caring for children in pain.

The six publications of pediatric observational studies reviewed stressed the need and strength of observation methods to better ascertain what actually happens in clinical practice and identify variables that will be susceptible to intervention (Byrne et al., 2001; Twycross, 2002, 2007a, 2007b, 2008; Woodgate & Kristjanson, 1996a). Their focus was on the effects of pediatric nurses' knowledge and attitudes regarding pain relief, perceived priorities and abilities to overcome barriers to pain management, emotional challenges to nurses' communication and management of pain, and adherence to clinical practice guidelines for pediatric pain management. They failed to describe the nurses' decision-making processes, priorities, and organizational factors that may influence pain assessment and management clinical practices. These studies focused on individual nurse-patient interactions related to pain, isolating these interactions from the complexities of managing a patient load on a postsurgical ward. Therefore, an expanded review of the literature to include other observational studies regarding the complexities of pain management, medication administration, and clinical practice was required.

*2.3.2 Observational studies of adult postsurgical pain management*

By observing and then interviewing nine nurses on three surgical wards at two hospitals in Norway, Dihle, et al.'s (2006) study revealed "The gap between saying and doing in postoperative pain management" (p. 469). Nurses said they value providing preoperative information about pain, but when observed they only provided such information when patients specifically requested it. Nurses said they assessed pain by communicating with and observing patients, but were observed to communicate pain assessment in different manners and some were less sensitive than others to patients' discomforts. Nurses said they recommended scheduled analgesics, encouraged analgesics before activities, and rarely used non-drug pain management techniques; but nurses were observed allowing patients to refuse scheduled analgesics, continue activity despite patients' obvious signs of pain, and use application of cold and massage to treat discomfort. Nurses said they evaluated for pain relief after providing analgesics, but were observed to only evaluate analgesic effectiveness after medications were given by the intravenous route. These findings stress the need to move from exploring what nurses know about pain assessment and management to observing how they apply this knowledge.

Other observational studies of nurses' work managing pain in acute postoperative settings were rare (Table 2.1). In total, eight studies were identified; and all but two (Clabo, 2008 and Wallace, 1989) were from outside the United States. While Dihle, et al.'s (2006) study was the most influential for highlighting the need for observational approaches to assess nurses' role in clinical pain management practice, Manias, Bucknall, and Botti were the most prolific authors in this field of inquiry with four relevant publications among them. Together with the previously reviewed pediatric observational studies, these works were used to inform this dissertation study design, methodology, procedures and plans for data analysis.

Table 2.1 Relevant Observational Studies of Adult Postsurgical Pain Management

| Citation | Sample | Methods | Purpose | Themes |
|---|---|---|---|---|
| Dihle, Bjolseth, & Helseth (2006)<br><br>Study con-ducted from May to Nov. 2001 | 9 nurses on 3 surgical wards at 2 hospitals in Norway, | <u>Observations</u> focused on nurses actions<br>Each nurse was observed during 2 day-shifts, 2 evening shifts & 1 night shift.<br><u>Interviews</u> focused on nurses reflections about what they do to manage postoperative pain<br>Interviews were conducted immediately each nurses last shift of observation | • Understand how nurses contribute to post-operative pain management in the clinical setting.<br>• Investigate nurses perceptions of post-operative pain management<br>• Identify barriers to achieving optimal post-operative pain alleviation | 1 main theme<br>A gap between what nurses said they did and what they actually did |
| Manias, Bucknall, & Botti, (2002) | 12 nurses on 1 surgical unit in a metropolitan teaching hospital in Melbourne, | Each nurse was observed once during a targeted 2-hour observation period.<br>Each observation | Investigate nurse-patient interactions associated with pain assessment and management in | 4 major themes were identified as barriers to effective pain management:<br>1. Nurses' responses to interruptions of activities relating to |

Table 2.1- *Continued*

| | | | | |
|---|---|---|---|---|
| | Australia | period was examined on 2 occasions. | hospitalized postsurgical patients | pain,<br>2. Nurses' attentiveness to patients' pain cues,<br>3. Variety in nurses' interpretations of pain<br>4. Nurses attempts to address competing demands |
| Manias (2003) | 6 nurses on 2 different postoperative gastro-surgical wards in a public teaching hospital in Melbourne managed 73 adult patients' pain treatment. | Each nurse was observed three times during targeted 2-hour observation periods. | Examine how nurses managed patient's pain within the gastro-surgical hospital setting | 3 major themes:<br>1. Nurses' assessment of patients' pain,<br>2. Influence of communication on nurses' pain management decisions,<br>3. Nurses' role in pain treatment |
| Manias, Bucknall & Botti (2004) | 52 nurses on 2 surgical units in a metropolitan teaching hospital in Melbourne, Australia managed 312 adult post-surgical patients' pain | Each nurse was observed during a targeted 2-hour observation period.<br>Each observation period was examined on at least 12 occasions for a total of 74 observations of 316 pain interactions.<br>Clarifying questions were asked of nurses after the observations | Determine how nurses' assessed patients' pain during pain activities in the postoperative context | 5 themes related to pain assessment:<br>1. simple questioning,<br>2. pain scale use,<br>3. complex assessment,<br>4. lack of pain assessment,<br>5. physical examination for pain. |
| Manias, Bucknall and Botti (2005) | Same as above | Same as above | Determine how nurses' managed patients' pain in the postoperative acute care setting.<br>Examine the effect of time and context on | 6 themes & 3 key issues related to the interplay of factors associated with post-surgical pain management of adults.<br><u>6 themes:</u><br>1. Managing pain effectively, Prioritizing pain experienced for pain management,<br>2. Missing pain cues, |

Table 2.1 - *Continued*

| | | | | |
|---|---|---|---|---|
| | | | nurses pain management strategies | 3. Regulators and enforcers of pain management,<br>4. Preventing pain,<br>5. Reactive management of pain<br><u>3 key issues</u><br>1. Critical nature of communication between nurses, patients and among clinicians,<br>2. Influence of time on pain management strategies,<br>3. Relative lack of importance nurses place on biobehavioral pain management strategies in clinical practice. |
| Clabo, 2008<br><br>Study con-ducted over 9 months from 2003 to 2004 | 20 nurses, 10 on each of 2 postoperative units in a teaching hospital in the United States of America | Ethnography<br><u>Phase I -</u><br>• gain entry to hospital & units<br>• establish researcher's role,<br>• develop relationships with nursing staff,<br>• become familiar with routines & rhythms of practice,<br>• begin to map out social context of each unit.<br><u>Phase II –</u><br>• observe nurses conduct pain assessments,<br>• semi-structured interviews to capture nurse's actual thinking<br><u>Phase III –</u><br>Focus group | Examine nursing pain assessment practice across two units:<br>1. In what ways does post-operative pain assessment vary across the two nursing units?<br>2. What is the impact of nursing unit social context on pain assessment practices? | Nurses used assessment criteria from 3 spheres:<br>1. The clients narrative,<br>2. Evident criteria, and a<br>3. Reference typology.<br>Social context profoundly influenced nurses' pain assessment practices. |

Table 2.1- *Continued*

| | | | | |
|---|---|---|---|---|
| | | discussion on each unit | | |
| Brown & Mc Cormack 2006 | 39 nurses from 2 colorectal surgical units of an acute hospital trust managed 46 older adult patients' pain treatment.<br><br>7 additional patients were interviewed before & after surgery.<br>35 nurses completed the Nursing Work Index-Revised Questionnaire | Ethnography:<br><u>Observation</u><br>• 62 hours of around the clock non-participant observations of nursing practice in targeted 2-hour observation period.<br>• 5 Additional handover observations.<br><u>Patient Interviews</u><br>Pre and Post-operative<br><u>Nursing Work Index-Revised Questionnaire</u> | -Examine pain management practices with older people admitted to a surgical unit.<br>-Identify factors in the practice context that enhance or inhibit effective pain management<br>-Identify how nurses contribute to assessment & control of post-operative pain<br>• Explore potential barriers to achieving effective pain control strategies<br>• Assess culture and nurse decision making in the unit | 3 sub-themes:<br>1. Pain assessment, communication, prescriptions and medicine rounds<br>2. Knowledge, insight, communication<br>Environment/ organization of care, communication |
| Willson 2000 | 9 nurses from 3 trauma/ orthopaedic wards managed the pain of one of 3 patients following repair of a fractured hip. | Ethnographic multiple-case study:<br><u>Observation</u><br>3 targeted 2-hour observation periods during 24 hours of care of each patient<br><u>Interviews</u><br>Semi-structured interviews with each of the 9 nurses observed were conducted during the last hour of their shift | Identify those factors which nurses take into account when administering analgesia to patients<br>1. What factors influence nurse in the administration of analgesia<br>2. What are the enabling and constraining elements?<br>3. How are | People-oriented, situational, and environmental factors influenced analgesic administration.<br><br>Factors found to influence decision-making were: time, organization of care, shift, impact of the multidisciplinary team, concerns over the use of opioid analgesia, and information giving and collection.<br>Nurses administration of analgesia is driven by |

Table 2.1- *Continued*

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|---|---|---|---|---|
| | | Documentation<br>Patients medical records, analgesic regime, nurses notes and charts were used to evaluate written communication | nurses enabled and constrained at each stage of analgesia administration: assessment, intervention, & evaluation? | strategic goals, set times for administration and the demands of the health care organization, rather than individualized evaluation of patients' analgesic responses. The desire to meet individual patient needs and conform to specific analgesic activities were found to be dependant on location(ward), shift, with the factor of time providing a tension between patients and nurses, and among nurses. |
| Wallace, (1989) | 47 nurses from 15 adult medical (12) and surgical (37) units observed during 2 nurse-patient interactions during up to a 4 hour observation period (91 observations). | Exploratory observation: 2 timed observations of nurse-patient interactions related to pain (40 minutes to 4 hours)<br>Instruments<br>1. Knowledge of Pain Questionnaire<br>2. Index of Attitudes about Pain Management<br>3. Empathy scale of the California Psychological Inventory, Empathic Concern and Personal Distress Scales<br>4. Professional Self-esteem<br>5. Pain Management Observation Instrument | Develop a model to predict therapeutic and nontherapeutic pain management behaviors of nurses using knowledge of pain management, attitudes related to pain management, empathy, professional self esteem, and select demographic characteristics as independent variables. | Empathy accounted for 8.8% of the variance of therapeutic verbal behavior.<br><br>Empathy, years of nursing experience and professional self-esteem were the best predictors of nontherapeutic behavior.<br><br>8% to 21% of variance in time spent with patient in pain could be accounted for with surgical nurses, nurses at higher positions and nurses with less years of experience spending less time assessing, intervening and evaluating patients in pain.<br><br>17 to 21% of variance in breaktime was accounted for with surgical nurses, nurses with high personal distress and nurses with less professional self-esteem spending less time between assessing and intervening for the patient with pain |

In their first study of 12 observations with 12 different nurses lasting two hours each, four major themes were identified as barriers to effective pain management: (1) nurses' responses to interruptions, (2) nurses' attentiveness to patients' pain cues, (3) variety in nurses' interpretations of pain, and (4) nurses' attempts to address competing demands (Manias et al., 2002). First, it was suggested that there was considerable delay from patient request for analgesia to medication administration due to interruptions. These interruptions were described as searching for equipment or other items not located in the immediate area, responding to requests for assistance from other nurses or nursing students, answering or making telephone calls, and performing other time-related tasks, like antibiotic administration. Unfortunately, these events were not timed, but Wallace (1989) did time 47 nurses' responses to patients' pain during 91 interactions. The average time for pain interactions was 5 minutes. The nurse left the patient's room and returned to intervene in an average of 3.54 minutes, excluding times when nurses didn't intervene, intervention was immediate or the patient requested not to have a pain management intervention. Response time was minimal in hospital rooms with analgesics stored in the rooms. Surgical nurses, nurses with high personal distress, and nurses with less professional self-esteem took less time between leaving the patient's room and returning to intervene. Wallace (1989) did not report on what the nurses did during the time they were away from the patients' rooms, so organizational factors, which may have influenced time, were not captured.

Other studies of medical-surgical nurses' time suggest that nurses are interrupted three to six times/hour and spend 3 to 7% of their time being interrupted, waiting, looking/retrieving, or delivering (Hendrich, Chow, Skierczynski, & Lu, 2008; Keohane et al, 2008; Potter et al, 2005). Senior nurses are more likely to be interrupted (Brown & McCormack, 2006; Potter et al, 2004). An excellent example of such a delay is provided in another study by Manias (2003) where she reports it took 22 minutes to administer morphine as the nurse "walked the whole **length of the**

**ward** and then walked back again, asking each nurse ‘Do you have the keys?’ to access the ’drug of dependence cupboard’” (p. 591).

The second theme related to nurses’ attention to patients’ pain cues (Manias et al., 2002). Nurses tended to be very attentive at times when other assessments were being made, such as obtaining vital signs. However, at other times, such as when patients commented about pain with dressing or position changes, nurses would acknowledge the statement but continue with the activity. The presence of sophisticated pain management technologies, such as epidurals and patient controlled analgesia, appear to improve pain assessment practices (Brown & McCormack, 2006).

The third theme related to nurses’ persistence in identifying the site of pain as the surgical incision rather than attending to other causes of patients’ pain, such as catheters (Manias et al., 2002). Finally the fourth theme was competing demands of nurses, doctors, and patients. While nurses were commonly observed interrupting care to attend to other demands, experienced nurses were more likely to act as a patient advocate during these interruptions.

Manias (2003) reports on a similar but smaller study that sought to examine the complexities of issues that influence how six nurses on two different postoperative gastro-surgical wards managed 73 adult patients’ pain. Each nurse was observed three times during targeted two-hour observation periods. Three major themes were identified: (1) nurses’ assessment of patients’ pain, (2) the influence of communication on nurses’ pain management decisions, and (3) the nurses’ role in pain treatment.

In characterizing the first theme, Manias (2003) identifies that the nurses used three methods of assessing postsurgical pain: (1) patient self-report using a pain scale, (2) vital signs, and (3) examination, including palpation, of the wound site. The most common method of pain assessment was the use of a pain scale, although more **experienced** nurses were more likely to also palpate and examine the abdomen, wound or drain and watch for patient’s facial responses, correlating vital signs with patient-report and these observations. Whereas, Willson

(2000) observed that pain assessment tools were only used when required by the pain management team to record patients' pain management progress.

Clabo's (2008) identified four methods nurses use to assess adults' postsurgical pain: (1) what the patient says, (2) the patient's way of talking, (3) how the patient looks, and (4) nurses' experience in similar circumstances. Yet three methods, which differ slightly from Manias' characterization, emerged from Clabo's ethnographic study of pain assessment on two postoperative units: (1) operative procedure, (2) patient's self-report (including the pain scale), and (3) objective assessment criteria. Clabo identified nurses' use of the operative procedure as a reference typology for pain assessment. While not reported as one of the three methods of pain assessment, Manias (2003) also found the patient's **condition** influenced pain assessments, with nurses associating pain severity expectations with specific surgical procedures or medical conditions.

Nurses are enabled in their decisions to administer analgesics through their reliance on the predictability of the expected course of pain related to the condition (Willson, 2000). Three examples illustrate this influence. In one, the experienced nurse thoroughly quizzes the patient regarding pain location and quality, concluding "I am satisfied that it is abdominal pain rather than cardiac pain" (Manias, 2003, p. 589). In another example, the nurse comments, "Her pain is just wind pain and it should not require as much analgesia as a big abdominal incision…The procedure she had does not warrant this kind of reaction" (Manias, 2003, p. 589). In a final example, the nurse states "I wouldn't be giving morphine on day three…morphine is for acute pain and it is more for severe pain postoperatively" (Willson, 2000, p. 1150).

Wallace (1989) found that nurses asked about pain, but didn't intervene in 22 of the 91 observed interactions. In two situations, nurses shared their personal assessment of the patient's pain. In one, the nurse remarked that the patient was a "wimp" (Wallace, 1989, p. 144). In the second situation, the nurse predicted that the patient, who had just returned from surgery, was not in pain and would go to sleep and forget about the pain. Instead, it was observed that the patient became increasingly more agitated and complained of pain again 20 minutes later. Nurses, who relied primarily on patients' condition or operative procedure, questioned patients' credibility and suggested that patients overestimated their pain in an effort to receive higher doses of analgesics (Clabo, 2008). Nurses who primarily relied on the patients' descriptions of their pain made no reference to overmedication concerns. Clabo concluded that the value nurses gave to these assessment strategies varied by unit.

All nurses were observed frequently reminding their patients of the importance of reporting pain to ensure that they received adequate pain relief (Manias, 2003). On the other hand, nurses were inconsistent with how they expressed the value of this information. Less experienced nurses praised patients for waiting to request analgesics, for example, "It is good that you were able to last this long…If I gave it [medication] to you before now, it might have been wasted" (Manias, 2003, p. 590). More experienced nurses used repeated questioning to find out the 'truth' about their patients' postoperative pain, for example one nurse commented to the researcher, "I said, 'How are you?' and then again 'How are you?' and by the third time they are telling you the truth" (Manias, 2003, p. 590).

The second theme, the influence of communication on nurses' pain management decisions, focused on communication with other healthcare professionals as well as policy and protocol concerns rather than nurse-patient communications (Manias, 2003). Formal communication with other nurses occurred during the handover process. While demographic and medication administration information were reported, broad statements such as "moderate success" rather than functional details regarding the effectiveness of pain management interventions were shared during this formal process (Manias, 2003, p. 590). Brown and McCormack (2006) also found that despite the two units observed adopting different approaches to nursing handover, pain was only mentioned if the patient was experiencing problematic pain or if the patient's pain was being managed with sophisticated pain management technologies, such as an epidural or Patient Controlled Analgesia (See Hall, Doran & Pink, 2008).

Another formal communication process was multidisciplinary ward rounds. The time for multidisciplinary team rounds coincided with medication rounds, which was the busiest time of the day; and therefore, challenged information sharing regarding patients' pain management status and needs (Willson, 2000). Multidisciplinary ward rounds appeared fragmented since the medical consultant did not seek the bedside nurse's input (Manias, 2003). When the Acute Pain Service rounded on patients, nurses rarely accompanied the team and seemed to abdicate responsibility for the patient's pain (Brown & McCormack, 2006). Rather, observed communications with doctors were normally informal and limited to requests for analgesic changes (Manias, 2003). A nurse in Willson's (2000) study describes the tension of crossing professional boundaries to influence analgesics prescription: "I wouldn't just go and ask the doctor to prescribe something. I just sort of ask them…suggesting something to doctors is not right but sometimes you have to" (Willson, 2000, p. 1151). Locating a doctor for analgesic prescribing was observed to take up to two hours on several occasions with considerable delays due to cross-communication (Brown & McCormack, 2006). Some observed communications were regulated by **policies and protocols** that resulted in care delays (Manias, 2003). In one reported instance, the nurse called because she believed her patient's epidural needed to be *topped up*. However, when the registrar requested that she do just that, the nurse informed him that policy forbid her from performing this task. The researcher notes that "Upon checking the chart the next day, the time taken for the registrar to write the order was three hours" (Manias, p. # 591)

Nurses' clinical judgments about medications were the key aspects associated with the third theme, nurses' roles in pain treatment (Manias, 2003). The majority of analgesics were ordered PRN and dosage ranges were prescribed for intravenous and epidural infusions to allow nurses to titrate analgesics. Therefore, nurses had considerable influence over how and when medications were administered. **Nurses' choices** between analgesics of varying strengths and requests to alter the route of medication administration are provided as examples of how nurses extend their role beyond simply administering medications in their efforts to treat patient's pain. Nurses appeared proficient at completing the necessary series of tasks for safe pain management practice (Brown & McCormack, 2006).

These studies emphasized the importance of examining the subtleties associated with nurses' work and the complexities of the clinical context in which nurses manage pain (Manias, 2003, Simon & Moseley, 2008). For example, Manias (2003) reports strained communication between the ward doctors and the pain service. "Consultants are sometimes protective of their patients…They want to have control…Nurses are not allowed to refer patients…All we can do is to work on the doctors and hope that we can convince them that referral is necessary" (Manias, 2003, p. 591). Thus suggesting there may be **political influences** nurses must negotiate to effectively relieve their patients' pain.

Clabo (2008) also reports how political influences impact nurses pain assessment practices. Through ethnographic methodology, Clabo explored the subtleties associated with nurses' work and the complexities of the clinical context in which nurses assess pain on two different postoperative units within the same hospital. Over a nine month period from 2003 to 2004, Clabo became familiar with unit routines, observed 10 of the nurses on each of the units of study, and then conducted focus groups. While there were many similarities in pain assessment practices across the two nursing units, social context profoundly influenced nurses' pain assessment practices. On one unit the nurses' primary postoperative pain assessment practices were based on the expectations and predictable pain trajectory of the operative procedure. These nurses were reluctant to contact physicians for new analgesic orders when patients' pain experiences did not follow the anticipated trajectory due to fear of being chastised by physicians. They expressed a need to keep the doctors happy. Nurses on the second unit relied on patients' descriptions of their pain as their primary pain assessment strategy, with operative procedure and anticipated pain trajectory a secondary reference for assessing the individual. Nurses on both units used objective and subjective methods of assessing pain, but nurses on the first unit relied primarily on objective assessment data, whereas nurses on the second unit relied primarily on subjective assessment data.

Nurses' analgesic administration decisions are also influenced by the unit environment, such as shift demands and key events (Willson, 2000). In describing a fatal incident, a nurse reported the details as though it was a recent event, rather than 18 months previously, "It's not so easy to monitor them as closely as you could during the day…some actually want (the injection) for sleeping purposes and that … can be dangerous" (Willson, 2000, p. 1149). Goals for analgesic administration were strategic, discharge oriented, during the day and evening shift, but tactical, safety oriented, during the night shift.

Acute postoperative pain assessment and management occurs on nursing units, which require structured social relationships. Decisions made by nurses to administer analgesics are the consequences of the interplay of organizational factors, such as the demands of the shift, organization of the ward, communication, organizational goals, and "rules" which link analgesic administration decisions to customary practice rather than formal education (Willson, 2000, p. 1149). Herrick (1998) sought to identify organizational factors that influenced pain relief, patient distress, and satisfaction of over 300 adult patients after abdominal surgery on two post-surgical care units. Medical record review, surveys and patient interviews were used, rather than observational methods. One aim specifically addressed patient care unit attributes such as staffing levels, patterns, educational backgrounds and nurse-physician collaboration. No relationship was found between staffing levels and patient outcomes. Low return rates on the collaboration surveys suggest either that collaboration was poor or that the responses are not representative. Comments written on the survey, however, strongly suggest poor collaboration. For example, concern was expressed for the potential of being identified by filling out the tool, and comments such as "nurses rarely join rounds …they leave notes attached to the history rather than join rounds, so mutual planning is impossible,"  and "very few (residents) ask for our input or value our input" (Herrick, 1998, p. 300).

Organizational values and beliefs provide a foundation for how things are done and thus impact all aspects of patient care, including pain assessment and management (Brown & McCormack, 2006). Since nursing practice is socially embedded, nurses working on the same unit demonstrate similar pain assessment practices (Clabo, 2008). The actions of individual nurses are public and therefore subject to scrutiny by other nurses. Nurses described the social context of pain assessment and treatment, "I don't think it would be possible (to practice pain assessment differently than others on the unit) It wouldn't be accepted….We would fix them (Clabo, 2008; p. 536); "I don't think it's (morphine) given much here after 24 hours postop" (Willson, 2000 p. 1150).

In two publications, Manias et al. (2004 & 2005) report a subsequent study of larger scale with 74 observations of 316 pain interactions between 52 nurses and 312 adult post-surgical patients, First, they analyzed the observations to further explore how nurses make decisions in their assessment of postsurgical patients' pain (Manias et al., 2004). Five themes related to pain assessment, were identified: simple questioning, pain scale use, complex assessment, lack of pain assessment, and physical examination for pain. Then, the research team analyzed the data and identified six themes and three key issues related to the interplay of factors associated with post-surgical pain management of adults (Manias et al., 2005).

The themes related to nurses' assessments of postsurgical patients' pain build on previous findings of smaller studies from this research team (Manias et al., 2002; Manias, 2003). Manias (2003), reported that nurses used three methods of pain assessment, pain scale, vital signs, and examination, with the pain scale being the most common method. However in this larger study, the pain scale was only used in 28 of 316 pain activities; while simple questioning, in which nurses were observed asking patients about their pain, was the most common method of pain assessment accounting for 143 of the 316 pain activities (Manias et al., 2004). While some nurses were observed asking patients direct questions about whether they required a pain medication, other nurses merely asked patients simple but ambiguous pain assessment questions, like “you ok” and “how are you?” (Brown & McCormack, 2006, p. 1293; Dihle et al., 2006, p. 473). When the pain scale was used, researchers report inconsistencies in how patients interpret the pain scale especially when patients had cognitive challenges or **cultural** and linguistic differences (Manias, 2003, Manias et al., 2004.) The second and third method of pain assessment, vital signs and physical examination, were previously described as being used by more experienced nurses (Manias, 2003). Yet, there were only three observations in this larger study in which nurses examined the site of pain and checked pain against vital sign assessments (Manias et al., 2004).

Clarifying questions and judgments sometimes followed nurses’ simple pain assessment questions. For example, “How is the pain since the morphine has stopped?” or “That wasn’t too uncomfortable, was it?” (Manias et al., 2004, p. 759). Nurses’ simple pain assessment questions were sometimes prompted by nonverbal cues, such as the expression on the patient’s face “What’s wrong? Are you in pain?” (Manias et al., 2004, p. 760). Non-verbal cues were also used as evidence to support patients’ responses to simple pain assessment questions. Questioning was relatively brief and shrouded with ambiguity and misinterpretation.

There were only four instances when a complex pain assessment was demonstrated (Manias et al., 2004.) In addition to using a pain scale, verbal descriptors were used in these cases to determine if the pain was getting better or worse, whether analgesics were effective, to elicit location and type of pain, to determine if the patient was experiencing analgesic related side-effects, and to clarify ambiguous terms. It was far more common to observe pain activities that did not include a pain assessment, 138 of 316 pain activities. Conditions that seemed to influence this lack of assessment were the administration of routine analgesics, care of patients with chronic, untreatable, intractable, incidental, or short term pain and care of patients who had difficulty communicating their pain. Nurses also seemed to avoid patients with chronic or problematic pain during Brown and McCormack's (2006) observations. Luckily, severe pain was rare.

Only two of the themes related to the interplay of factors associated with post-surgical pain management of adults, prioritizing pain experiences and missing pain cues for pain management, are similar to the themes previously identified by this research team (Manias et al., 2002; Manias et al., 2004; Manias et al., 2005). Nurses were observed to "trivialize" pain management to complete other activities that were considered of higher priority, such as medication rounds, assessment of vital signs and changing of wound dressings (Manias et al., 2005, p 24). If patients experienced pain when other routine medications were due, they were more likely to get analgesics than when they experienced pain with dressing changes or ambulation (Manias et al., 2004). "Medicine rounds" were the primary time for nurses to assess pain and make analgesic treatment decisions (Brown & McCormack, 2006; Willson, 2000). Yet, almost half of the nurses did not conduct any form of pain assessment during Manias et al.'s (2004) observations. Nurses were observed to miss 27 of the 316 pain interactions, most of which were due to ambiguous pain cues such as moaning, groaning, patients' descriptions of being sore rather than in pain, and patients' reports of only having pain with movement (Manias et al., 2004; Manias et al., 2005). Of the 91 pain interactions observed, Wallace (1989) notes that a family member or another nurse initiated the discussion of pain on 10 occasions, the patient initiated the discussion of pain on 39 occasions, and the nurse initiated the discussion of pain on 42 occasions. Although, the interactions were considered nurse-initiated if the patient moaned and the nurse then asked the patient about pain. Some nurses were observed to be more attentive to patients' signs of pain and others less sensitive (Dihle et al., 2006). When patients provided contradictory responses, such as "I have no pain, but my leg is sore," nurses predominantly responded to the "no" component and did not administer analgesics (Manias et al., 2004, p. 759). In one example, however, the patient reports a pain level of 7 out of 10 and the morphine infusion is never adjusted by the observed nurse (Manias et al., 2005).

The additional four themes related to the interplay of factors associated with post-surgical pain management of adults include (1) managing pain effectively, (2) acting as regulators and enforcers of pain management, (3) preventing pain, and (4) reactive pain management (Manias et al., 2005). First, the researchers reported 28 of 316 pain interactions where nurses managed pain effectively by identifying pain cues, involving the patient in decision making, responding quickly to intervene, and then evaluating the pain management strategy. In one example, the nurse checked the chart, assessed the patient, and provided an analgesic within two minutes. This is an excellent example of efficiency, but unfortunately, this is the only data reporting time from pain assessment to intervention in this study.

To provide support for the second theme, the role of nurses as regulators and enforcers of pain management, examples of how nurses both policed pain management to ensure routine medications were given on time and withheld analgesics from patients in pain until the medication was due as ordered were described (Manias et al., 2005). In one example, the patient was informed she would need to wait 40 minutes for the next analgesic dose, despite the patient's request for something for pain; alternative pain management strategies, such as positioning, were not offered. The third new theme, preventing pain, included nurses' enforcement of routine analgesic administration, but also included encouraging the patient to push their PCA before potentially painful procedures and inviting the patient to report pain. There were 35 pain activities, 11% of the total pain interactions, coded as pertaining to this third theme. Dihle et al. (2006) also observed several nurses giving analgesics prior to patient mobilization. This could be quite challenging, however as described by Willson (2000); where therapists desired patients to be treated before therapy, but did not give a predetermined time for planned patient mobilization so nurses could appropriately intervene to prevent pain. Finally, the fourth theme of reactive management of pain was applied to 65 of the 120 cases of analgesic administration. Nurses were observed to administer analgesics after, rather than prior to, painful procedures, such as ambulation and dressing changes.

The findings of this larger observational study highlight three key issues: (1) the critical nature of communication between nurses, patients and among clinicians, (2) the influence of time on pain management strategies, and (3) the relative lack of importance nurses place on biobehavioral pain management strategies in clinical practice (Manias et al., 2005). First, this study described how nurses engage patients in decision making for pain management and collaborate with other clinicians to address complex pain management decisions. This study also illustrated when ineffective communication, such as ambiguous pain cues, hindered pain management.

The influence of time was suggested as a second key issue (Manias et al., 2005). Time and manpower may influence nurses' decisions to administer opioids (Willson, 2000). Time steers the organization's work, patients are taken off opioids within 48 hours; rounds, medications and nursing handover are provided at set times; and nurses complain there is not enough time to evaluate patients responses to analgesics. While the researchers discuss shift-related time constraints, interruptions, busyness of nursing work, prioritizing of other tasks, and timing of medications as support for identifying time as a key issue, data that quantified time elements were rare and require further study (Manias et al., 2005; Wallace, 1989; Willson, 2000).

Time may also have implications for why nurses were observed to rarely use biobehavioral interventions, the third key issue identified in this observational study (Manias et al., 2005). Of the 35 interventions observed in Wallace's (1989) study, analgesic administration was the primary intervention. Only six interventions were non-pharmacologic; and five of these were repositioning the patient, while only one involved distraction and relaxation techniques. Brown and McCormack (2006) also comment on a lack of observed non-pharmacologic strategies and nurses reliance on analgesics, although they note that non-pharmacologic strategies were used to enhance patient comfort at night to "get the patient settled properly" (p.

1293). Nurses reported not using biobehavioral treatments for pain, but were observed using cold and massage in Dihle, et al.'s (2006) study.

In the studies led by Manias, observations were staged at what were described as "key periods for activities relating to pain" (Manias, 2003; Manias et al., 2002; Manias et al., 2004; Manias et al., 2005). These two-hour observation periods included: (1) change in shift and staff overlap times, (2) night shift pre-sleep assessment times, (3) high activity morning periods and ward rounds, (4) availability of medical staff for consultation, and (5) staff lunch and tea breaks. The observation times were: (a) 04:00-06:00, (b) 08:00-10:00, (c) 12:00-14:00, (d) 14:00-16:00, (e) 18:00-20:00, (f) 21:00-23:00. The interval of two hours was chosen since it was anticipated to provide both a period of sustained observation and ample opportunity for each patient to be observed at least once. Brown and McCormack (2006) used a similar approach, observing practice around the clock over 32 days in two-hour blocks for a total of 62 hours of observations. They explained this system of data collection would ensure observations were manageable and provide a representative range of pain management activities. An additional five observations of nursing *handover* reports were included, since this is considered an important time for communication between nurses. While this is a well referenced approach for conducting observational data, two-hour block time intervals fail to provide sufficient opportunity to observe how **nurses' familiarity** with their assigned patients, changes in patients' conditions, and changes in care demands throughout a shift may influence their pain management decisions. Wallace (1989) observed nurses during two pain related interactions and found that none of the first observation correlations were confirmed with the second observations despite similar time patterns and patient populations. There was a tendency for the second observation to be less therapeutic and for the nurses to exhibit more nontherapeutic behaviors. Wallace (1989) commented that this may be explained by the Hawthorne effect and recommends longer observations to describe nurses' true pain management behaviors.

While not identified by the researchers as a theme or key issue, some nurses appeared to accept pain as a normal part of patient postsurgical course, whereas the goal of other nurses was to relieve their patients' pains (Dihle et al., 2006; Manias et al., 2005). These differences in nurses' pain management goals may influence nurses' pain management practices. Nurses also appeared to be more successful in managing patients' pains if they took an active approach: using open and direct pain assessments, being highly sensitive to patient's objective signs of pain, using combinations of analgesics and administering analgesics to prevent pain (Dihle, et al.). Whereas, nurses were less successful when taking a passive approach for postsurgical pain management: using indirect communication to assess pain, overlooking objective signs of pain, and expecting patients to be responsible for managing their analgesics and pain treatments. Nurses are encouraged to genuinely listen to patients, to "ensure that the patients' pain story emerges, rather than the story nurses expect to hear" (Manias et al., 2004, p. 767).

*2.3.3 Implications of observational studies of adult postsurgical pain management for pediatrics*

Observational studies of nurses' postoperative care of adults provide over a dozen themes characterizing nurses' challenges and activities related to pain management. These may or may not be relevant to management of children's acute post-operative pain. The specific care examples of post-surgical pain management of adults in Australia provided by Manias et al. (2005) can be used to highlight clinical practice differences with pain management standards for children in the Southwest United States. In one example, the nurse administers an intramuscular injection of pethidine (Meperidine) to an adult patient with an intravenous line (Manias et al., 2005). Intramuscular injections and Meperidine have not been recommended for pain management for over a decade and have rarely been used in the past 20 years to relieve children's pain (Agency for Health Care Policy and Research, 1992).

The role of the family in pain management may also be a variable of significant influence for pediatric patients as compared to what was reported in the adult studies. Of the studies reviewed there were only three examples of interactions with families and their influence on nurses' pain management practices (Brown & McCormack, 2006; Manias et al., 2005; Wallace, 1989). In preparation for this dissertation, a pilot study was conducted. At least one family member was with 55 of the 58 pediatric patients at all times during pilot study observations and one additional parent was sometimes present during the nurse's 12-hour shift. Parents' role for pain assessment and management during these pilot observations included alerting the nurse to their child's pain, clarifying pain assessment data, developing with or dictating to the nurse the pain management plan, including requesting analgesics (Manworren, unpublished pilot study data, 2009).

Manias et al., (2005) illustrated ineffective communication, such as ambiguous pain cues, hindered pain management. This finding has implications for further study in pediatric postsurgical patients who may not be able to clearly articulate their pain and whose pain management decisions often include a guardian or family member. Nurses report success and challenges when having to rely on children's behaviors to assess pain (Gimbler-Berglund et al., 2008). Recall Woodgate and Kristjanson (1996a) interviewed and observed 11 children, 2 to 6 years of age on a pediatric surgical unit to describe how parents and nurses respond to young children's post-operative pain. Nurses suggested that they looked for **overt signs of pain** such as crying and ambiguous cues such as restlessness, but that "knowing the child" (Woodgate & Kristjanson, 1996a, p. 277) was the key to assessing pain in young children who are at great potential to have difficulty clearly articulating their pain. They observed minimal dialog between parents and nurses regarding children's pain, but noted that nurses relied on parents to tell them when their child was in pain.

Woodgate and Kristjanson (1996a) describe comforting techniques as being the duty of the parent while nurses carried out the more technical pain care activities; time constraints may have implications for this observed division of labor. Time was implicated as a rationale for why nurses were observed to rarely use biobehavioral interventions in observational studies of adults (Manias et al., 2005). Observations in pediatric studies suggest a similar lack of nurses' use of biobehavioral pain management strategies (Twycross, 2007a; Woodgate & Kristjanson, 1996a). These differences in pain management interventions and potential contextual influences support the need for replication of similar observational studies in the pediatric post-surgical care setting.

Nurses' clinical judgment about medications was the key aspect associated with nurses' roles in pain treatment (Manias, 2003). How nurses decide when to give analgesics to children requires further investigation. Willson (2000) concluded that nurses are enabled in their decisions to administer analgesics through their reliance on the predictability of the expected course of pain related to the condition. Recent interviews with Swedish pediatric nurses also provide evidence of nurses' reliance on the patient's diagnosis, "One child had a cancer tumour in the leg and you understood that she was in a lot of pain" (Gimbler-Berglund et al., 2008, p. 22). Simons and Moseley (2008) reviewed 175 pediatric charts from two different hospitals to determine how nurses administered analgesics the first 24 hours after surgery. Analgesics were more likely to be given if they were regularly scheduled, than if they were prescribed PRN as needed. The prescribing patterns differed between the two hospitals. More than twice as many children received morphine at the children's hospital than at the hospital with a pediatric ward; whereas more codeine was given on the pediatric ward, but this may be because codeine was also prescribed more frequently at this site than in the children's hospital. Thus organizational factors influence nurses' analgesic administration choices.

Manias (2003) stressed the importance of interdisciplinary communication and described how these interactions were regulated by **policies and protocols**. Nurse-physician cooperation is also important for providing children with satisfactory pain relief (Gimbler-Berglunch et al., 2008). Nurses expressed concern that hierarchical relationships, organizational structures or characteristics of individual healthcare professionals may be barriers to good cooperation.

*2.3.4 Other relevant time and motion studies*

The influence of time has been identified as a key issue in nurses' pain assessment and management practices. Yet, time was not recorded during most observational studies or observations were only obtained during targeted time periods. Observational studies focused on individual nurse-patient interactions related to pain, as if assessment, treatment and reassessment are a linear relationship, isolating these interactions from the complexities of managing a patient load on a postsurgical ward. Therefore, this review of select time and motion studies inform both methodology as well as provide insight into potential organizational and workflow issues, which may influence pediatric nurses' pain assessment and management on a post-surgical care unit.

Human factors engineering techniques have been successfully used to analyze clinical care processes. Traditional human factors engineering methodology presumes that effective, efficient and safe processes take into account physical, cognitive and organizational capabilities and limitations, such as noise, lighting, short-term memory, fatigue and decision-making approaches (Boston-Fleischhauer, 2008). Nurses' cognitive processes, however, are not easily observed (Potter et al., 2004). Therefore, an approach for analyzing nursing care that combines human factor engineering analyses and qualitative observation was developed as a method for mapping nursing processes and cognitive pathways. Nursing care is nonlinear and involves complex clinical reasoning and decision-making based on patients' changing status. Nursing involves overt physical activities that can be observed, but also covert cognitive behaviors that require the observer to ask questions about nurse's priorities and intent in order to provide context to the observations (Potter et al.). Cognitive pathway methodology is appropriate for analyzing the work of nursing and how it is influenced by the conditions of an acute care environment (Potter et al.).

Two studies regarding the nursing process have been published using cognitive pathway methodology. In their first publication, the research team, reports the cognitive pathways of an experienced nurse during the first 10 hours of a 12-hour shift (Potter et al., 2004). The nurse was interrupted 43 times, 24 of which were during nursing interventions. She made 71 cognitive shifts and 128 links in the care of six patients. Cognitive shifts are the movement between patients' priorities and needs, as well as across steps of the nursing process. Links are the travel to complete elements of a task; and link analysis provides insight into the 'costs of time' taking into consideration distance, frequency, and resource consumption (Potter et al., 2004). The cognitive pathways illustrated the nurse's organizational skills and efforts to conserve time by completing care activities by geographic area. The researchers conclude that the cognitive pathway is a useful method of investigating nurses' organizational skills and ability to provide timely nursing interventions. Of note, the researchers recount that the nurse was inconsistent in evaluating patients, specifically for pain relief after analgesic administration.

In their subsequent publication, the research team uses cognitive pathway methodology to analyze the work of seven registered nurses (Potter et al., 2005). Each nurse was observed for 4 to 9 hours for a total of 43 hours of observation. Nurses were unique in the manner in which they organized and approached patient care, with some nurses starting their shift by conducting rounds and then proceeding with interventions, such as medication administration; and other nurses first preparing all morning medication and then conducting patient rounds.

Nurses averaged 13 links and 9 cognitive shifts per hour (Potter et al., 2005). The researchers clarify that a cognitive shift represents a shift in thinking from one patient to another; it is not merely a physical movement by the nurse. Thus nurses spent an average of 31 minutes in each patient's room during the observations, but nurses averaged 46 minutes of cognitive focus per patient over the same observation period. The researchers emphasize that traditional human factor engineering analysis may therefore underestimate the time nurses need to provide care to patients.

Nurses spent the greatest percentage of time in consultation (26%), patient contact (25%), documentation (23%) and medication preparation and administration (16%) (Potter et al., 2005). Patient contact included the nurses' time assessing the patient and providing all direct care activities, except medication administration. Nurses also spent 5% of their time searching for supplies, equipment and other staff, and another 5% of their time in breaks from patient care.

These results are inconsistent with a much larger time and motion study of nurses' work completed by Hendrich et al. in 2008. While Potter et al. (2005) studied cognitive work through direct observation and inquiry, traditional time and motion studies focus on the influence of unit layout on nurses' use of time and travel requirements to provide care. Therefore, it is no surprise that time spent in activities reported through Potter et al.'s (2005) direct observation of seven nurses varied greatly from the time 767 nurses from 36 hospitals spent in nursing activities as reported by Hendrich et al. (2008).

Nurses' activities were tracked through four different protocols using personal digital assistants (PDAs), radiofrequency identification (RFID) tags and/or physiological monitors (Hendrich et al., 2008). The 385 nurses enrolled in the documentation protocol used PDAs to record all documentation-related activities during their shift. The 382 nurses enrolled in the time protocol carried PDAs, which randomly vibrated 25 times during the 13 hour shift, no more often then every 10 minutes. On average nurses responded to 17 PDA alerts during a shift. Almost all of these nurses (n=750) participated in the nurse location and movement protocol, which tracked nurse's distance traveled in relation to the physical layout of the unit. By fitting each nurse with 4 RFID tags, stops of 20 to 30 seconds would be detected. The 288 nurses who volunteered for the physiological monitoring protocol wore a specialized armband to record physiologic metrics both on and off shift for 23 hours per day for seven consecutive days. Data were collected during 2201 shifts and 21,882 hours with an average shift lasting 9.94 hours.

Nurses reported that 77.7% of their time or 417 minutes per 10 hour shift was devoted to nursing practice; yet only 155.8 minutes of this time were spent in the patient room (Hendrich et al, 2008). Nursing practice was described as time devoted to documentation (147.5 minutes, 35.3%), care coordination (86 minutes, 20.6%) and patient care activities (81 minutes, 19.3%). The specific patient care activities of assessment and obtaining vital signs took only 7.2% or 30.9 minutes per 10-hour shift. Medication administration time was broken down as drug delivery (46.7minutes) and medication preparation (24.9 minutes). Nurses spent 214.2 minutes, 38.6% of their time, at the nurses' station. Units involved in this study were described as racetrack, corridor, or radial design, but there were no statistically significant relationships between unit design, time spent with patients or distance traveled. Nurses traveled 1 to 5 miles per 10-hour shift, or a median distance of 3 miles during the day, and 1.3 to 3.3 miles per 10-hour shift, or a median distance of 2.2 miles at night. Time spent on various nursing activities and distance traveled varied by shift; and the variability between individual nurses on the same unit was greater than the variance across different study units. Only 6.6% of nursing time was reported in time-wasting activities like searching and gathering (Hendrich et al.).

While Potter et al. (2005) found that 16% of nurses' time was spent on medication administration and Hendrich et al (2008) found nurses spent only 12% of their 10-hour shift on medication administration, Keohane et al (2008) quantified nursing workflow in medication administration as 26.9% of nurses' time. They found this to be fairly consistent across clinical areas and throughout the day, with a range of 22.8% to 29.1%. These researchers used continuous time-motion observation, capturing data in real time by entering observations into an access database on a tablet personal computer and categorizing activities into 112 discrete observable patient care tasks (Keohane et al.). 108 nurses on 29 units (intensive care units, medical units, surgical units and medical/surgical units) were observed during 116 two-hour observation sessions. Medication administration time was further described as (1) obtaining and verifying medications, 7.44% of nurses' time; (2) medication delivery including preparing the medication and obtaining liquids for the patient to drink with medications, 6.7%; (3) retrieving information or consulting a pharmacist regarding how to administer a medication, 3.87%; (4) discussing and resolving questions related to medication orders, 3.86%; (5) documentation of medication administration, 2.83%; (6) delays, such as waiting for the physician to call or an approved medication to be sent by the pharmacist, 0.17%. Time in non-medication administration-related tasks was also captured. Communication took 22.6% of nurses' time, physical patient care 14.5%, documentation 10.1%, computer usage 8.4%, searching for supplies 3.5%. Fourteen percent of activities were recorded as miscellaneous, with 83% of this time recorded as nurses' travel within the unit (Keohane et al.)

Interruptions consumed (on average) 7% of nurses work time (Potter et al., 2005). The human factors engineer defined an interruption as "any activity that stops the nurse from performing an immediate task", whereas the nurse researcher "defined interruptions as actions on the part of other staff or occurrences from the environment that disrupted the nurses' performance of a nursing process activity" (Potter et al., p. 332). The disparity in these definitions resulted in 261 human factors engineering interruptions (5.9/hour) and 151 nursing process interruptions (3.4/hr). Forty-seven percent of interruptions occurred during interventions, and 22% occurred in the medication room. An average of 1.3 interruptions per hour occurred during medication preparation due to staff inquiries, missing medications, missing supplies, phone call or pager alarms.

Researchers are concerned that interruptions during medication administration activities may increase risks for medical error (Potter et al., 2004; 2005). In addition to the physical aspects of medication administration, the cognitive processes must be considered. Eisenhauer, Hurley, and Dolan (2007) investigated nurses' thinking processes during medication administration using semi-structured interviews and real-time tape recordings. They found that nurses' thinking processes extend beyond the five rights of medication administration. Two types of deviations were identified: (1) shortcuts for the benefit of the nurse or the patient, and

(2) indications of professional thinking. Ten categories were identified through content analyses that describe nurses' thinking during medication administration: (1) communication, (2) dose-time, (3) checking, (4) assessment, (5) evaluation, (6) teaching, (7) side effects, (8) work-arounds, (9) anticipatory problem solving, and (10) drug administration. Situations, like pain management, which require judgment in dosing, timing or medication selection, provided the most explicit data regarding nurses' critical thinking and clinical judgment.

While interruptions may increase risks for medical error, no errors occurred during observations (Potter et al, 2004; 2005). Omissions, on the other hand did. Omissions were defined as a planned activity, medical order, or shift report plan that was not implemented. Of note is the example of an omission provided by the study authors, "if a nurse assessed a patient experiencing discomfort and failed to provide pain relief measure" (Potter et al., 2005, p. 332). With the implementation of a bar code/eMAR system for medication administration, nurses' thinking about medication administration didn't change, but they did express a new concern of checking the computer for assurance that they had not omitted a medication dose.

Technology may improve nursing care efficiency (Eisenhauer et al., 2007; Henrich et al., 2008; Keohane et al., 2008). Researchers have investigated nurses' time requirements for the most frequently used pain management technology, patient controlled analgesia (PCA). Mordin et al. (2007) prospectively followed the resource utilization for PCA for 457 patients after surgery. Set-up of the PCA occurred in the PACU for 93.9% of patients on average within an hour of surgery and patients remained on PCA for an average of 32.6 hours. Over the course of treatment nurses reported performing an average of 39.6 IV PCA related tasks (Table 2.2). For a total of 54.3 minutes of the overall 67.4 minutes of PCA related care recorded. Analgesic side effects occurred in 71.8% of patients in the study and pump related activities such as set-up, cleaning, re-programming, addressing alarms and patient/family tampering occurred in 43.1% of subjects. In addition, nurses spent an average of 40.7 minutes each year in IV PCA training.

Given these results, it is unclear whether PCA decreases nurses' workload and improves pain management efficiency.

Table 2.2: Common PCA Related Tasks

| Task | Average number of times per subject | Minutes per subject |
|---|---|---|
| Evaluating pump use and settings | 8.1 | 8.2 |
| Assessing the IV site | 7.8 | 4.5 |
| Evaluating and addressing analgesia side effects | 4.5 | 3.9 |
| Instructing/reinstructing the subject on PCA use | 3.5 | 3.9 |
| Administering supplemental pain medications | 3.4 | 7.8 |
| Assisting with self-care or moving the subject | 1.8 | 7.8 |
| Assisting the subject with use of the button | 1.8 | 1.2 |
| Set up | | 11.7 |
| Discontinuation | | 5.2 |

The primary reason for nurse attrition is the inherent workload of the profession, Hendrich et al, (2008) quantify the physical and workload demands nurses endure. Thus, the demographic characteristics of the unit workforce also significantly influence the work environment. For example, Hall, Doran, and Pink (2008) found that older nurses reported lower perceptions of work quality and higher perceptions of job stress. Similarly, nurses with more years of experience on a unit had higher perceptions of quality of care. Nurses with baccalaureate degrees also reported higher levels of job stress, presumably due to their greater sense of accountability for their work. Nurses on units with higher patient to nurse ratios report lower perceptions of work quality and higher job stress. Nurses working on units that use a team nursing approach report significantly higher perceptions of quality of care than nurses working on units using a total patient care delivery model. Work demands and approaches to the work of nursing may influence pediatric nurses' ability to respond to children's post-operative pain in a timely manner.

## 2.4 Barriers to Pediatric Acute Pain Management

Several barriers to the effective treatment of pain in hospitalized children have been identified through surveys, retrospective chart reviews and interviews with pediatric nurses. These include: (a) lack of assessment and intervention evaluation, (b) inadequate knowledge and attitudes regarding pain assessment and management, (c) fears of adverse analgesic side effects, (d) inability to overcome barriers to optimal pain management, (e) **time**-constraints, (f) characteristics of the patient, family and nurse, including age, gender, previous experience with pain, surgical severity, post-operative day, personal values, beliefs and attitudes about pain (AAP & APS, 2001; Cheng et al., 2003; Ely, 2001; Manworren, 2000**;** Woodgate & Kristjanson, 1996a; Vincent & Denyes, 2004; Vincent, 2005).

Recent studies suggest that we are successfully overcoming some of the previously identified barriers to effective pain management, but that children's routine pain management remains sub-optimal (Vincent, 2005; Vincent & Denyes, 2004). Huth, et al. (2003) report that of 51 3 to 16 year olds, 76% received opioids after open or closed cardiac surgery, but 16% did not receive any analgesics. Vincent & Denyes (2004) report similar results in their study of the analgesic practices of 67 nurses from seven pediatric nursing units and the self-report pain levels of the 132 pediatric patients in their care during six-hour intervals (Vincent, 2005). They concluded that severity **of children's reports of pain** was a significant predictor of nurses' decision to provide analgesia. 74% of children in their study were medicated for pain relief. Unfortunately, that means 26% of children were not provided analgesia for their reports of pain after surgery.

### *2.4.1 Lack of assessment and intervention evaluation*

Drendel, Brousseau, and Gorelick's (2006) analysis of the National Hospital Ambulatory Medical Care Survey (NHAMCS) data from 1997 to 2000 found that documentation of children's pain scores increased odds of analgesic and opioid prescription. They also found that pain scores were documented in only 44.5% of the 24,707 visits included in the database. Pain scores were less likely to be documented when the patient was younger, self-pay, when the visit was to a pediatric facility, and when the visit was not designated as related to an injury.

Only 22% of children had a documented pain assessment when 1,602 charts from six university-affiliated pediatric units were audited in 2002 (Johnston et al., 2007). Non-pharmacologic interventions were noted in 5% of the charts, with repositioning being the most common intervention. Analgesic administration was documented more frequently than assessments. The researchers point out that although one could conclude that analgesics were given without assessments, 88% of the analgesics were ordered PRN, which would suggest that an assessment occurred. Documentation of analgesic administration is probably an accurate reflection of what occurred in practice, since documenting medication administration is legally required. While there is a belief that pain management will improve if pain is obvious and communicated through documentation, like vital signs, Johnston et al.'s (2007) research showed a drop in pain assessment documentation on a unit where analgesic administration stayed consistent. Perhaps lack of documentation of assessment and non-pharmacologic interventions is the result of a lack of incentive or legal requirement to note these efforts, rather than a true lack of pain assessment and management. Johnston et al.'s (2007) findings support the need to observe actual clinical practice rather than merely auditing charts to assess nurses' pain management practices.

*2.4.2 Inadequate knowledge and attitudes regarding pain assessment and management*

Surveys have been developed to determine pediatric nurses' knowledge and attitudes regarding pain which may be a barrier to children's optimal pain management. Manworren (2001) developed the 42-item Pediatric Nurses' Knowledge and Attitude Survey Regarding Pain (PNKAS) and used it to describe the knowledge and attitudes of the 274 pediatric nurses from a large (242-bed) children's medical center in the Southwest United States (Manworren, 2000). Sixty six percent of the questions were answered correctly. Nurses with their master's degree (75%), hematology/oncology nurses (76%), intensive care unit nurses (71%) and emergency room nurses (70%) scored significantly higher than nurses with less academic preparation and nurses from other patient care units. Permission has been granted for the tool to be used in over 100 hospitals in the United States and healthcare facilities in the United Kingdom, Canada, Ireland, Australia, and New Zealand. The tool has also been translated by researchers in China, Taiwan, Israel, Germany, Turkey, Norway, Peru, Portugal, Italy and Puerto Rico for use with pediatric nurses in these countries. Despite extensive dissemination of the tool, few published studies using the survey were identified in a search of CINAHL, Medline, Mental Measurement Yearbook, PsycARTICLES, and PsycINFO. The author, however, has received study replication results from children's hospitals across the world.

Nurse researchers from the Shriner's hospital system have further modified the PNKAS to eliminate oncology related questions since cancer is not treated in their facilities (Rieman, Gordon, & Marvin, 2007). Seventy-four percent of the questions were answered correctly by a convenience sample of 295 nurses in the eight pediatric hospitals (Rieman & Gordon, 2007). Nurses who participated in professional organization and committees and nurses with more experience scored significantly higher than other nurses surveyed. Recent surveys suggest that responses reflect improved awareness of appropriate pain assessment practices and treatment decisions (Enskar et al. 2007; Griffin et al., 2007, 2008), but interviews with pediatric nurses suggest that both pain management knowledge and attitude deficiencies still exist (Gimbler-Berglund et al., 2008).

Few studies have correlated responses on pediatric nurses' knowledge and attitudes regarding pain surveys to clinical practice (Jacob & Puntillo, 1999; Johnston et al., 2007; Twycross, 2007b; Vincent, 2005; Vincent & Denyes, 2004). Twycross (2007b) found that 4 of the 12 nurses tested had good theoretical knowledge about pain (a score of over 80%) with scores ranging from 69 to 89% and a mean score of 78%. Even when nurses had a good level of theoretical knowledge of pain assessment and management, this was not reflected in their observed clinical practices. This finding suggests that gaps in knowledge are not the primary reasons for clinical practice deficits; rather the gap is between what pediatric nurses know and what pediatric nurses do.

Of the 113 nurses studied, the number of pediatric pain management courses nurses had completed and the hospital where nurses were employed were the only two variables that correlated with increased pain knowledge scores (Johnston et al., 2007). Pediatric nurses' knowledge and attitude scores at the six hospital sites ranged from a mean of 66% to 82%. Nurses who received one-on-one coaching had a significantly greater increase in pain knowledge compared to nurses in the control group, although there was a significant increase in knowledge scores from one of the three control group hospitals and a significant decrease in scores at one of the three hospitals where coaching was implemented.

Children who had documented pain assessments were cared for by nurses who had higher scores on the Pediatric Nurses' Knowledge and Attitudes Regarding Pain Survey (Johnston et al., 2007). Nurses who documented analgesic administration had higher scores than nurses of patients who did not have documentation of analgesic administration. The hospital of employment again seemed to be a significant variable, since all patients received at least one analgesic in 24 hours at one hospital, whereas four other hospital sites had a significant decrease over time in analgesic administration documentation.

Vincent and Denyes (2004) found that of the 67 nurses from 7 units of a Midwestern hospital who were surveyed, 55% thought over 20% of children over-report pain (Vincent, 2005). While 82% of the nurses reported believing the child's self-reported pain intensity when behavioral cues were added; only 49% reported believing the patient in the absence of behavioral cues. When offered a choice to provide more analgesia, 73% of nurses reported a desire to provide more analgesia to the child with self-reported severe pain when behavioral cues were added, but only 27% would provide the increased dose of analgesia in the absence of the additional behavioral cues.

To better understand pediatric nurses' decision-making processes when responding to children's pain, Vincent (2007) examined the congruence between 20 nurses' cognitive representations and their pain assessment and management decisions using pediatric post-operative vignettes and interviewed 30 nurses regarding their response to the two vignettes (in review). These investigations were based on Kaplan's cognitive representation theory that knowledge is organized over time as a result of repeated exposure to an experience and embodies an individual's assumptions, beliefs, facts, and misconceptions (Vincent). Well-developed cognitive representations, therefore, are easily activated; thus they influence nurses' decision-making and behavior. Individual nurse's cognitive representations of acute pain management included 5 to 24 items (Vincent, 2007). Self-report was included on 13 of the 20 subjects' cognitive maps; whereas 16 subjects included behavioral manifestations, with 10 nurses including both assessment categories. Pharmacologic management was included on 15 of the subjects' cognitive maps, 12 included non-pharmacologic treatment approaches, 7 included family involvement, and only 5 nurses included all three methods of managing children's pain. Vincent (2007) found that the four pediatric nurses who did not choose to provide any analgesia, despite self-reports of severe pain in the vignettes, did not include self-report or behavioral manifestations of pain in their cognitive maps, or these nurses rated behavior with a higher importance than self-report. The cognitive maps of the seven nurses who increased the analgesic dose were more likely to include and assign a similar importance rating to both self-report and behavior pain assessment methods. Nurses who did not provide analgesia and those who decided to increase the analgesic dose rated non-pharmacologic treatment approaches as more important than pharmacologic methods, but nurses who did not provide analgesia in the vignettes were more likely to include both categories in their cognitive map.

Factors nurses identified as influencing their pain assessment and management decisions on the two vignettes differed when the vignette patient was smiling despite a self-report of severe pain or grimacing with a similar self-report of severe pain (Vincent, in review). While the majority of nurses reported a pain score congruent with the vignette report, for the smiling patient, nurses identified pain rating, mismatch of rating and patient behavior, vital signs, vocalization and the child's understanding of the pain scale as the factors influencing their assessment and management decision; whereas for the grimacing patient, nurses identified pain rating, vital signs, and mobility as the influencing factors. Nurses identified the prior dose of morphine as the factor that influenced how much morphine they would administer with subsequent doses. Nurses who were hesitant to increase the morphine dose from the previously administered dose despite vignette patients' continued reports of severe pain revealed misconceptions about duration of action for morphine and fears of overmedication, sedation and respiratory depression.

*2.4.3 Fears of adverse analgesic side effects*

In Vincent and Denyes' (2004) study regarding pediatric nurses abilities and analgesic administration practices, 52% of nurses reported an exaggerated incidence of opioid related respiratory depression, but only 27% exaggerated the incidence of opioid addiction (Vincent, 2005). Christenson (2000) found that fears of addiction and other treatment side effects have increased influence for nurses who are parents.

*2.4.4 Inability to overcome barriers to optimal pain management*

Pediatric nurses' knowledge and attitudes regarding children's pain and the nurses' abilities to overcome barriers to optimal pain management were measured with survey tools developed by the researchers (Vincent & Denyes, 2004; Vincent, 2005). Nurses who reported a greater ability to overcome barriers to optimal pain management had more years of nursing experience and scored higher on the knowledge and attitude regarding pain survey. When asked to rank a list of barriers to optimal pain management, the top two barriers were inadequate or insufficient orders and the medical staff's low priority for pain management.

Nurses actual pain management practices were also scrutinized (Vincent, 2005; Vincent & Denyes, 2004). Results highlight a lack of relationship between reported nurses' knowledge, attitudes, and abilities to overcome barriers as measured through survey methods and pediatric nurses' clinical abilities and actions to reduce or relieve pain as documented through children's self-reported pain scores and amount of analgesics administered. The researchers identify that a significant limitation of this study's methodology was that it inadequately addressed **nurses' decision making processes** (Vincent & Denyes). These researchers admit that conducting research in and about a real practice environment present significant design challenges, but emphasize that if we continue to rely on knowledge generated from hypothetical vignettes and surveys, our knowledge will remain limited and fail to reflect practice realities (Vincent & Denyes). .

*2.4.5 Time-constraints*

It takes more time to prepare analgesics for administration and provide pharmacologic and developmentally appropriate biobehavioral interventions than it does to ask about pain or observe pain behaviors in an effort to assess children for pain (Johnston et al., 2007). Johnston et al. (2007) suggest that time constraints may explain why pain assessment documentation improved more than pain management documentation after coaching sessions. Yet, this study relied on chart audits rather than real time observation of clinical practice. Perhaps nurses provide interventions, but fail to take the time to document these efforts. Johnston et al. (2007) notes there are no incentives to document nursing interventions especially non-pharmacologic efforts to make children more comfortable. Future studies need to explore the importance of the organizational context, including policies, staffing, and culture, which may impact the nurses prioritization of pain assessment, intervention and documentation.

*2.4.6 Characteristics of the nurse, patient, and family*

2.4.6.1 Nurses' characteristics: Age, gender, and ethnicity

Several factors such as nurse's education level, age, years of experience, personal experience with opioids, and nurse's ability to overcome barriers have been investigated as influencing pain management decisions (Ely, 2001; Manworren, 2000; Polkki et al., 2003; Pud, 2004; Simons & Roberson, 2002). Nurses' own experience with analgesics influenced their treatment choices "Like Ibuprofen, I know that is a wonderful medicine so I believe in it myself (have used it with good results)" (Gimbler-Berglund et al., 2008, p. 23). Research suggests that nurses who are better educated, with more clinical experience, or have had personal experience with pain are more skilled in making optimal pain management decisions for their pediatric patients (Burokas, 1985; He, Polkki, Vehvilainen-Julkunen & Pietila, 2005; Holm, Cohen, Dudas, Medema, & Allen, 1989; Manworren, 2000; Polkki, Vehvilainen-Julkunen & Pietila, 2001; Salantera, Lauri, Salmi & Helenius, 1999; Vincent, 2005; Vincent & Denyes, 2004).

Results of the influence of nurses' characteristics on nurses' pain assessment and management decisions, however, are inconsistent across studies (Burokas, 1985; Christenson, 2000; Griffin et al., 2008; Holm et al., 1989; Twycross, 2002; Vincent, 2005; Vincent & Denyes, 2004). Griffin et al.'s (2008) presentation of the 2005 national survey of nurse characteristics and inferences about children's pain indicate that nurses' age, race/ethnicity, education, prior experience of pain, recent pain training and years of clinical experience were not significantly associated with nurses' pain perceptions or their pain management choices. The only significant survey findings were that nurse practitioners recommended higher doses of analgesics than non-nurse practitioners, current employment in nursing was related to pain ratings, and white nurses recommended use of more non-pharmacologic methods of pain management than non-white nurses. Christenson (2002) also found that nurses with advanced degrees chose higher opioid doses, and suggested greater confidence regarding pain assessment and management.

Twycross (2002) found no significant differences in relation to nurses' age and their administration of analgesics, but nurses who had been in the profession for over 10 years were less likely to administer analgesics than nurses with 2 to 10 years of experience.

2.4.6.2 Personal values, beliefs and attitudes about pain

Of 134 pediatric nurses questioned, 12% confirmed complete pain relief was their pain management **goal** (Burokas, 1985). The majority, 61.2%, indicated their goal was as much pain relief as possible. Burokas (1985) found that nurses who chose the goal of pain relief also stated they would provide, in vignette situations, more analgesics than nurses who did not express pain relief as their pain management goal. This goal was the single most important factor affecting pediatric nurse's analgesic administration. More research is needed to investigate how nurses' goals for pain management influence their clinical actions and pain management interventions.

Pediatric nurses' beliefs, perceptions and misbeliefs regarding postoperative pain management have been surveyed (Christenson, 2000; Margolius, Hudson, & Michel, 1995). Improvements are suggested by survey results over time. The most prevalent belief of Margolius et al.'s survey of 207 pediatric nurses was that infants and children seldom need analgesics for pain after surgery. Nurses also commonly believed children did not feel pain because of their immature nervous system and that crying was the only way to know if an infant was in pain. Instead, Christenson found in surveying 68 pediatric nurses that they no longer reported these misbeliefs and that their responses were consistent with clinical practice guidelines. Pediatric nurses in Margolius et al's survey indicated that feelings of powerlessness and limited collaboration hindered their ability to manage children's pain. Whereas pediatric nurses responding to Christenson's survey believed they had a powerful influence on children's pain management; however their perceptions of whether nurses actually exercised this power in clinical practice were not as strong. They perceived that pediatric nurses still do not consistently assess children's pain and do not document the effectiveness of pain management interventions (Christenson; Margolius et al.). Higher levels of education correlated positively with beliefs and perceptions (Margolius et al.) and negatively with misbelief statements (Christenson). Pediatric nurses who were parents, however, were more likely to agree with misbelief statements (Christenson).

Nurses' responses to survey questions about pain management beliefs, perceptions, and misbeliefs were consistent with clinical practice guidelines, but as previously mentioned were incongruent with their perceived and actual clinical behavior (Christenson, 2000; Twycross, 2002, 2008). Nurses need to identify their own feelings and preparation when assuming responsibility for children's pain assessment and management; and to recognize how these factors may affect their clinical practice to assure they effectively address and alleviate pain. The priority pediatric nurses place on pain influences clinical practice and how well patients' pain relief needs are met.

2.4.6.3 Surgical severity and post-operative day

In Herrick's (1998) dissertation study of factors that influenced adult patients' pain intensity and satisfaction after abdominal surgery, patients with transverse and long incisions received more morphine equivalence per body surface area than patients with vertical and shorter surgical incisions. Patients with vertical incisions were less satisfied. Patients with longer incisions also reported more pain on postoperative days three and four, when patients are expected to be walking, sitting and more active. The type of surgery affected pain intensity score upon return to the postoperative unit. Herrick notes that analgesic orders are rarely individualized by surgical procedure except for patients requiring liver resection, who received epidural fentanyl and also reported less pain immediately after surgery. Herrick found that the outcome of surgery, specifically whether the patients returned from surgery with a new ostomy or a diagnosis of cancer, significantly lowered patients' satisfaction. Yet, patients with moderate to high pain intensity reported being very satisfied with care. Satisfaction, therefore, may reflect differences in patients rather than pain relief and care unit characteristics.

2.4.6.4 Pediatric patients' characteristics: Age and cognitive level

Children's characteristics, such as their age, cognitive level, previous pain experience, temperament, coping-styles, gender, ethnic and cultural background influence their interpretation and response to pain. These characteristics cannot be changed, but their influences must be understood by the nurse to better care for the child experiencing pain.

Age and cognitive ability influences how a child defines and understands pain (Cheng et al., 2003; Neul et al., 2003). As age and the child's level of cognitive development increases, the child's understanding of pain, coping strategies, and the impact of pain also increases (McGrath & Hillier, 2003).

Children's ability to communicate their pain and describe the experience reflects their maturity (McGrath & Hillier, 2003; Crandall, Miaskowski, Kools, & Savedra, 2002). School-aged children and adolescents rank the word 'pain' to indicate greater pain intensity than the words 'hurt' and 'ache', respectively (LaFleur & Raway, 1999). Nurses should find out what words the child uses to describe pain and use these terms during interactions with the child. Children's language of pain also reflects their previous pain experiences, ethnic and cultural background, and specifically the words and expressions used by family members and peers.

How age influences a child's report of pain intensity is less clear. It is believed that children judge pain severity and unpleasantness in comparison to previous sensations (McGrath & Hillier, 2003). Younger school-aged children tend to select the extremes of Likert-type pain rating scales regardless of the number of rating choices (Chambers & Johnston, 2002). They also report their least and most painful experiences resulted from similar childhood injuries and tissue damage, whereas reports from adolescents reflect a greater variation in tissue injury and duration. Older children will generally have a wider frame of reference as they encounter more diverse pain experiences. So, previous pain experiences are an important component to explain the diversity of pain intensity reports from similar tissue damage in children of similar age and cognitive abilities.

Pediatric nurses may use age to discriminate analgesic administration. Christenson (2000) found that in vignettes, pediatric nurses gave infants (7 days to 3 years of age) less morphine than older children (8 to 14 years of age) despite having similar diagnosis and body mass corrections. The less likely the nurses were to believe that crying was the only way to know if a child was experiencing pain, the more morphine they were likely to administer. Pediatric nurses were better able to choose the appropriate dose for older children than they were for infants and toddlers. This may reflect the complexity of assessing and managing pain in children who are unable to provide self-report.

2.4.6.5 Children's characteristics: Gender

Gender related differences in pain sensitivity, vulnerability, pain experiences, expressions, and treatment efficacy are receiving increased attention in pediatric pain research (Cheng et al., 2003; McGrath & Hillier, 2003). Vincent and Denyes (2004) found a weak correlation between gender and pain intensity, suggesting girls report higher levels of pain than boys (Vincent, 2005). Studies investigating gender variations in pain expression in infants have provided inconsistent results (Unruh, 1996). In fact, the preponderance of research has been unable to show a relationship between gender and pain response. Yet, several key studies indicate that school-aged boys may be more stoic in their response to pain (Cheng, et al.). Researchers found that boys were more likely to underestimate their pain and that girls were more likely to overestimate their pain (Cheng, et al.; McGrath & Hillier). Young school-aged children demonstrated gender differences in response to procedural pain, with girls exhibiting more behavioral distress to venipunctures, immunizations, and bone marrow aspirations (McGrath & Hillier). Girls also cried significantly more than boys in response to pain. Additional research indicated no gender difference in children's cognitive understanding of pain, but girls use more affect laden words to describe their pain experiences.

Gender differences in health care utilization for pain tend to emerge during childhood (Unruh & Campbell, 1999). First born girls from lower socioeconomic classes are more likely to seek school health services. Yet, this may be the result of societal norms and expectations reinforced much earlier in children's lives. For example, research indicates that parents of toddlers report that their boys are less sensitive than girls to common bumps, bruises and pains (Unruh & Campbell, 1999). Day-care workers are more likely to provide physical comfort to girls hurt on the playground than boys. Therefore, gender-related differences may be influenced by ethnic, cultural, and societal expectations and customs (McGrath & Hillier, 2003). Healthcare providers are not immune to these societal biases regarding gender differences in pain expression and treatment.

2.4.6.6 Children's characteristics: Race, ethnicity, and culture

Examination of the National Hospital Ambulatory Medical Care Survey (NHAMCS) from 1992 to 1997 indicated that African American children insured by Medicaid were the least likely to receive parenteral analgesics or sedatives during treatment of their fractures (Hostetler, Auinger, & Szilagyi, 2002) While these data provide evidence of racial and ethnic disparities in the treatment of children's pain, more research is needed to explore the factors that influence these findings. Experimental pain research in adults indicates that ethnic differences in pain sensitivity and tolerance exist and may contribute to ethnic disparity in the experience and treatment of clinical pain (Berstein & Pachter, 2003; Green et al., 2003). However, ethnic differences in pain sensitivity, expectations, pain responses, treatment and response to pain treatment are most likely multifactorial, ultimately the result of complex and dynamic interactions of biologic, psychologic, and sociocultural processes (Green et al.).

Sociocultural factors, both the cultural or ethnic background of the individual in pain, as well as the social setting; influence perception, communication, tolerance, response, coping strategies, treatments and effectiveness of these treatments for pain experiences (Bernstein & Pachter, 2003). Culture shapes individuals' subjective experiences of pain and teaches behavioral responses to pain through modeling, direct explanations, instruction, and observation. Culture acquisition begins in infancy and continues into adulthood. Yet, individuals within an ethnic or cultural group should not be stereotyped to a particular set of pain beliefs and behaviors. Intracultural variations results from individual experiences, education, and current circumstances.

Few studies have examined cultural effects of children's perceptions and communication about pain (Bernstein & Pachter, 2003). Research regarding validity and reliability of pain scales indicate less reliability of behavioral scales than self-report pain scales for children of different cultural backgrounds. This finding suggests that the children's behavior differences during painful procedures may reflect cultural influences. Little cultural variation in verbal communication of pain through the use of both self-report tools and qualitative descriptions has been found. Acculturation of children has been suggested to explain the lack of significant cultural differences (Bernstein & Pachter).

Cultural sensitivity in the communication of children's self-report of pain requires appropriate assessment tools (Wiroonpanich & Strickland, 2004). While translations of assessment tools are available, few tools have been validated for cultural fitness (McCaffery, 1999; Van Cleve, Munoz, Bossert & Savedra, 2001). Initial content, construct, and concurrent validity and test-retest reliability of a translated version of the Adolescent Pediatric Pain Tool may capture quality descriptors of pain for Spanish speaking children of at least two different sociocultural backgrounds (VanCleve et al., 2001) Beyer and Knott (1998) developed and validated pain intensity scales specifically for African-American and Hispanic children in an effort to improve accuracy of pain assessment for these minority children cared for in a majority health care system (Bernstein & Pachter, 2003; Beyer & Knott).

Genetic and cultural factors influence variability in individual response to pain treatments (Burroughs, Maxey, Crawley & Levy, 2002; Lea, 2005). Genetic factors may alter the absorption, distribution, metabolism, excretion or action of medications. Codeine, for example, is poorly metabolized by 5-10% of white patients, and 1% of Asians who lack the enzyme to convert the analgesic to its active form (Burroughs et al., 2002). Diet and herbal remedies can alter drug metabolism.

Care should be delivered in a culturally sensitive manner. Nurses must avoid stereotypes, but be aware that cultural and individual factors influence a child's behavioral response to pain (Clyde & Kwiatkowski, 2002). Country of origin, often related to culture, may affect reaction to pain. Children are socialized in the cultural mores of their family system. Therefore, parents and other family members can provide insight and guidance to reveal the cultural influences that may impact assessment and treatment of children's' pain (Davidhizar, Havens & Bechtel, 1999). Pain assessment should take these social and cultural factors into account and the treatment plan should accommodate the cultural beliefs of the parents and children whenever possible.

2.4.6.7 Stereotypes of patients' physical attributes

Stereotypes may play a role in pediatric nurses' pain assessment and recommendations for managing children's pain. While results have been mixed, the bulk of evidence from studies of adult patients suggests nurses are more likely to recommend aggressive treatment for male versus female patients; white versus minority patients, unattractive versus attractive patients (Green et al., 2003; Griffin et al., 2007). In four studies that included children, race and sex did not influence pain treatment (Griffin, et al.). In two studies that included children, racial minorities with fractures were less likely to receive opioids for pain in the emergency departments (Hostetler et al., 2002; Pletcher, Kertesz, Kohn, & Gonzales, 2008).

The first study to suggest that stereotyping based on children's personal attributes may influence pain assessment and treatment was Beyer et al.'s (1983) classic study. This retrospective examination of analgesic prescriptions and administration revealed sex stereotyping involving children (1 day to 14 years of age) following cardiac surgery. Boys were prescribed significantly more codeine and girls were prescribed significantly more acetaminophen.

More recent studies found children's age, race and gender did not seem to influence nurses' analgesic administration patterns (Griffin et al., 2007; Vincent, 2005; Vincent & Denyes, 2004). In surveys, there was no evidence that nurses' perceptions of children's pain or nurses' clinical recommendations were influenced by stereotypes based on children's physical attributes of sex, race, or physical attractiveness (Griffin, et al.). For the majority of vignettes, nurses' reports of children's pain were consistent with the children's self-report, although nurses perceived the unattractive child to be in slightly more pain. Comparable doses of analgesics and number of non-pharmacologic interventions were recommended by nurses for all the pediatric vignettes, regardless of the children's physical attributes. There was, however, a difference in the types of non-pharmacologic interventions nurses recommended, with significantly more nurses considering television, videos, and electronic games for boys and significantly more reporting they would rock or swaddle girls and recommend girls read to themselves as compared to boys.

2.4.6.8 Children's previous experiences with pain

Past experience with pain impacts pain perception. Research indicates that infants who have experienced painful procedures display a more intense behavioral response to subsequent procedures (von Baeyer, Marche, Rocha & Salmon, 2004). Long term effects are suggested based on prematurely born adolescents who demonstrate lower pain thresholds in an experimental pain study (Buskila et al., 2003). As children age, mature, and through the knowledge gained in subsequent painful events, they are able to reframe pain experiences, which then alter perceptions of pain severity (McGrath & Hillier, 2003).

Additional research has helped to distinguish that it is not just the past exposure to pain that affects a child's subsequent response, but the nature of child's pain experience. Fear and anxiety may intensify the perception of pain, especially if previous experiences have been negative (McGrath & Hillier, 2003; Rocha, Prkachi, Beaumont, Hardy & Zumbo, 2003). Children with a history of negative pain experiences are at risk for increased anxiety, distress, and pain consistent with expectations from subsequent painful events, regardless of individual coping styles.

2.4.6.9 Children's pain expectations, acceptance, and tolerance

Children's pain expectations, acceptance, and tolerance influence their pain experiences. Research comparing children's expectations of pain and pain experiences indicate that younger children are less accurate than older children in predicting their procedural pain intensity (von Baeyer, Carlsen & Webb, 1997). Children that expected more pain tended to report more post-operative pain (Foster & Varni, 2002).

Pain acceptance and pain threshold are the terms used to describe the pain an individual is willing to live with or the pain an individual is willing to tolerate without analgesia (Cheng et al., 2003; Miaskowski, 1999). Research regarding pain acceptance has focused on children's post-operative pain thresholds. Results of two studies indicate that 36-51% of children reported post-operative pain scores higher than their pain threshold scores. In other words, children experienced more pain than they were willing to accept or could tolerate.

Pain tolerance is differentiated from pain acceptance and pain threshold as the pain an individual is willing to withstand for some reason or period of time (Cheng et al., 2003). Research regarding children's pain tolerance has been limited to parent's perceptions. Parents' predictions of pain tolerance in needle procedure pain studies significantly correlated to actual distress behaviors exhibited, especially for younger children. These results suggest that parental predictions of children's tolerance of pain from common needle procedures may be helpful information for healthcare providers performing subsequent needle procedures. Conversely, when the focus of the research was more unique pain experiences, such as experimental cold pressor pain and pain after spine surgery, parental predictions of children's pain tolerance did not correlate with children's self-reports of pain intensity (Foster, Yucha, Zuk & Vojir, 2003; Kotzer, 2000).

2.4.6.10 Children's characteristics: Temperament and coping styles

Temperament has been described as innate personality that predisposes the child to react with a certain behavioral response style (Broome, Rehwaldt & Fogg, 1998). This is a relatively stable trait that correlates with the child's response to pain. "Difficult" (poorly adaptable) children were more prone to display distress behaviors than "easy" (adaptable to new situations) children (Finley & Schechter, 2003; Rocha et al., 2003). More intense children also tended to receive more postoperative pain medications (Wallace, 2005). Temperament has not been shown to influence the actual intensity of the pain experience, but it does seem to influence children's expression of pain behaviors.

Lack of control exacerbates fear and anxiety, thus amplifying the pain experience. Many of the cognitive-behavioral techniques for pain reduction (relaxation, deep breathing, distraction, hypnosis) work because they reduce anxiety and fear and increase the child's sense of control or mastery over the situation (Kuttner & Solomon, 2003). Children who have a perception of control over a situation and are involved in it respond with more adaptive behaviors (Ellis & Spanos, 1994). For example, the child who helps remove bandages often tolerates a painful dressing change better than one who is restrained while the procedure is done to his or her body.

Coping style, the strategies a child uses to cope with stressors, is another individual characteristic influencing pain. Examples of different coping styles are information seeking, approaching, attending to the pain versus avoiding, distracting, or focusing attention away from the painful stimuli (McGrath & Hillier, 2003). Researchers reported that teaching methods that contrasted or matched children's preferred coping styles were both effective psychological interventions to better control children's pain. These mixed results suggest that children may need different coping strategies for different pain experiences and types of pain.

2.4.6.11 Parental influence

In pediatrics, the healthcare rights of the patient, legal minors, are assumed by the parents. Parents and legal guardians access and secure treatment from healthcare providers for children in pain; therefore, the parents' pain perceptions, expectations, beliefs and treatment concerns influence children's pain experiences (Cusick, 2003; Huth et al, 2003; Miaskowski, 2003; Schechter, Berde, & Yaster, 2003). The parents' cultural beliefs about pain should be explored. Supplying information and discussing parents' concerns regarding pain and pain management may be effective for updating parents' knowledge and assuring the parental participation necessary for providing optimal pain relief for children (Huth et al., 2003; Polkki, 2002; Simon, 2002).

Research regarding parental influences in pediatric pain management has focused on the meaning of pain for parents, pain assessment, procedural pain management, treatment, and parental satisfaction. Parents of children that died of cancer reported that their children died in significant pain (Wolfe et al., 2000). Yet, Woodgate and Degner (2003) report that families and children with cancer expected the child would suffer with symptoms, like pain. They believed it was necessary for the child to continue to fight these symptoms, since fighting the symptoms was more tangible and less frightening than fighting the cancer. The meaning given to a child's pain may be a parental barrier to providing effective pain relief.

Mixed results regarding the accuracy and value of parents' assessment of children's pain have been reported by researchers. Strong correlation between parents' predictions of children's procedural pain distress and children's actual behaviors indicate that parents can provide accurate anticipatory guidance of children's response to pain from common healthcare procedures (Cheng et al., 2003; Franck et al., 2000; Kankkunen, Pietila & Vehvilainen-Julkunen, 2004). Parents are familiar with children's behaviors and responses to everyday painful bumps and bruises, but they may be unfamiliar with the amount of pain experienced after more extensive trauma, surgery or other novel pain experiences (Cheng, et al.; Manworren, Paulos, & Pop, 2004). While some studies indicate better correlation between parent and child pain ratings than those of healthcare providers and children, other studies indicate that parents under or overestimate their child's post-surgical pain (AAP & APS, 2001; Cheng, et al.; Huth et al., 2003; Simon, Franck, & Roberson, 2001; Kankkunen et al., 2004)

Parents provide valuable assessment data to recognize pain in children that are unable to provide a self-report due to cognitive impairments (Carter, McArthur, Cunliffe, 2002). Parents report unique behaviors and behavior clusters used by their children to express pain (Hunt, Mastroyannopoulous, Goldman & Seers, 2003). Tools to capture these data for use by healthcare providers are being validated (Breau, Finley, McGrath, & Camfield, 2002; Finley, Chambers, McGrath, & Walsh, 2003; Solodiuk & Curley, 2003; Terstegen, Koot, Boer & Tibboel, 2003).

Children want to be with their parents and parents want to be with their children during painful procedures (Broome & Huth, 2003; Finley & Schechter, 2003). Strategies to reduce parental anxiety have been associated with decreases in children's report of pain and their pain behaviors (AAP & APS, 2001). This suggests that parents should be carefully prepared for what will happen to the child and how the parent can coach the child to cope with the procedure (Broome et al., 1998; Huth et al., 2003; Kleiber & McCarthy, 1999; Melnyk, Small & Carno, 2004). The child may display more distress behaviors when the parent is present. Research indicates that providing the child developmentally inappropriate amounts of control, lack of parental attention on the child, and providing praise and apologies to the child rather than focusing on distraction and coping skills may elicit these distress responses (Kleiber & McCarthy; Broome & Huth, 2003). Despite providing instruction regarding non-drug methods that parents could use to comfort their child after cardiac surgery, research indicates most parents chose not to use these interventions (Huth et al., 2003). Healthcare providers and parents are encouraged to focus on the child and reinforce coping and distraction strategies to reduce distress during painful procedures.

Treatment of children's pain by parents is suboptimal (Kankkunen, Vehvilainen-Julkunen, Pietila & Halonen, 2003; Sutters & Miaskowski, 1997). Parents report that their children experienced more pain than they had expected after day surgery. Unsatisfactory discharge information, inability to comply with discharge instructions due to fatigue, lack of trust in children's self reports of pain, and fear of addiction from pain medications were significant barriers to parents ability to manage their children's pain after surgery (Kankkunen et al., 2004; Kankkunen et al., 2003) Validation of a pain assessment tool specifically designed to help parent's quantify their child's pain at home after surgery, Parent's Postoperative Pain Measure, and the development of explicit written instructions to supplement verbal discharge directions may guide parents to provide better pain management (Finley et al., 2003, Kankkunen et al., 2003).

Parental satisfaction with children's pain management does not reflect the amount of pain experienced after surgery (Foster & Varni, 2002). Instead, satisfaction relies on providing parents with sufficient information and meeting their expectations (Melnyk et al., 2004; Polkki, Pietila, Vehvilainen-Julkunen, Laukkala & Ryhanen, 2002; Simons, 2002). Poor communications between healthcare providers and parents, as well as, low expectations for pain relief continue to be barriers to effective pain management (Kankkunen et al., 2003; Simons & Roberson, 2002). Parents are resistant to voice their concerns about their child's pain, because they do not want to be perceived as difficult or to be challenging the nurses' expertise (Simons, Franck & Roberson, 2001); therefore, nurses must open the lines of communication and encourage dialog about children's pain if relief is to be achieved.

## 2.5 Theory of Bureaucratic Caring

The meaning and application of Ray's Theory of Bureaucratic Caring will be presented as it relates to the care of hospitalized children in pain. Ray's Theory of Bureaucratic caring originated as a grounded theory of the dynamic structure of caring within an organizational culture (Ray, 1999). The original research revealed the struggle of nurses to serve both the bureaucracy and human beings through care (Ray, 1999). The Theory of Bureaucratic Caring evolved from the Hegelian dialectical process of examining the codetermination of polar opposites, specifically the humanistic dimensions of caring (educational, social/cultural, and spiritual/religious) as the thesis and the bureaucratic dimensions of organizations (political, economic, legal, and technologic/physical) as the antithesis of caring. The formal theory reflects a "synthesis of caring understood as a humanistic phenomenon and influenced by competing structures and processes within the organizational culture and the society as a whole" (Ray, 1989, p. 34). Nursing and caring are contextual and are influenced by the organizational culture.

Culture is defined as shared meanings systems in which individuals communicate, perpetuate and develop their knowledge and attitudes (Ray, 1989). Organizational cultures are social constructions that formalize how people interact (Ray, 1999). Bureaucracy is an efficient system of workplace organization. In bureaucracies, power flows from official authority based on hierarchical roles and principles. Systems for the allocation and exchange of resources and record keeping are defined. Fairness and equality in treatment of all employees require general rules of performance and specific standards of work and output. Rules and regulations are applicable to all employees including managers. There are fixed divisions of labor with employment based on technical qualifications. Reliance on expertise, skills and experiences are relative to positions. Bureaucracies are often criticized for being inflexible. This may be the result of the authoritarianism of bureaucracies that places power into the hands of few.

Bureaucratic caring is further defined in terms of humanistic dimensions and the competing bureaucratic dimensions of organizations. These dimensions are classified into seven structural caring categories (Ray, 1989). The bureaucratic categories are political, economic, legal, and technological/physiological. Categories of humanistic phenomena are educational, social/cultural and spiritual/religious. (Table 2.3).

Table 2.3 Aspects of Bureaucratic and Humanistic Dimensions of the Bureaucracy of Caring

| | |
|---|---|
| Bureaucratic dimensions | |
| Political | Role stratification<br>Division of labor<br>Power<br>Decision making<br>Communication patterns<br>Regulatory influences<br>Distribution of resources within an organization |
| Technologic/physiological | Knowledge and skill to operate and use equipment to maintain the physiological functions of the patient. |
| Economic | Allocation of resources to provide care while maintaining the viability of the system. |
| Legal | Responsibility<br>Accountability<br>Liability<br>Right<br>Rules and guiding principles of behavior. |
| Humanistic dimensions | |
| Spiritual/religious | Acts of faith<br>Empowerment<br>Creativity<br>Choice<br>Hope<br>“Brotherly love.” |
| Social/Cultural | Communication<br>Compassion<br>Concern<br>Involvement<br>Intimacy<br>Love<br>empathy in caring<br>Respect and trust in providing care<br>Adhering to culturally defined standards of moral behavior |
| Educational | Educational programs<br>Information<br>Teaching. |

Ray's Theory of Bureaucratic Caring tries to explain the work of nurses in clinical practice and factors that effect performance outcomes. The care goal is the focus (Figure 1.1). Caring is centered in the diagram, emphasizing the convergent focus on the provision of care in nursing. The differential aspects of care are illustrated by the concentric depiction of equally spaced care dimensions. The theory relies on the interplay of concepts, specifically, the dimensions of caring for nursing. The interplay dynamics of the care dimensions are represented by the arrows towards or away from care. The Theory of Bureaucratic Caring illustrates the interplay of organizational forces and barriers and their effect on nursing's ability to facilitate choice and achieve caring.

*2.5.1 Development of the Theory of Bureaucratic Caring*

Nursing's humanistic philosophies and theories are being challenged by the transformation of healthcare systems to corporate enterprises that emphasize competitive management and economic gain (Ray, 1989). The conflict between the view of healthcare as a business and healthcare as a human need has resulted in the undervaluation of care in economic terms of cost and worth (Ray, 1999). The need to justify the economic impact of nursing within a business culture has moved nursing from centering on patient care to the preservation of humanistic care within a corporate culture. The Theory of Bureaucratic Caring was inductively developed based on qualitative research data in an effort to advance nursing's understanding of hospitals as cultural systems and to clarify the meaning of caring within these systems (Ray, 1989).

Ray and colleagues have explored the political and economic dimensions of the Theory of Bureaucratic Caring (Ray, 1989, 1994, 1999; Ray, Turkel & Marino, 2002). Results of their inquiry suggest economics as the more dominant modality and a barrier to care, while continuing to support the reliance on all aspects of caring for the interrelationship and interconnectiveness of the human dimension of nursing care (M. A. Ray, personal communication, October 29, 2004). The legal, educational, social/cultural, and technological/physiological dimensions of bureaucratic caring require further definition through scientific inquiry.

The Theory of Bureaucratic Caring has been previously used to explore nurse-patient relationships, but only from a nursing administration perspective (DiDominic, 1995; Landry, 2001). Turkel (1999) emphasizes the value of the theory to guide clinical practice as well as research and nursing administration. M. A. Ray, however, is unaware of attempts to apply this theory to clinical practice in research (personal communication, October 29, 2004). Research that focuses on clinical problems and clinical practices may provide further support and definition for the dimensions of caring described in this theory. Weighting of the dimensions of caring may vary as the result of the approach and perspective of the inquiry. Predictability of this model for care performance has not been tested.

*2.5.2 Philosophical perspective*

Development of the formal Theory of Bureaucratic Caring is based on the literature and supporting theories of chaos, tacit knowledge, and complexity science. Ray outlines nursing support for the Theory of Bureaucratic Caring based on theories of caring from Leininger, Watson and Benner (Ray, 1989, 1999; M. A. Ray, personal communication, October 29, 2004). These nursing theorists identify caring as the core of nursing (Hilton, 1997). Leininger defines nursing as “a learned humanistic art and science that focuses upon personalized care behaviors, functions, and processes directed toward promoting and maintaining health behaviors or recovery from illness, which have physical, psychocultural, and social significance or meaning for those being assisted” (Leininger, 1984, pp. 4-5). Watson studied nursing care by attempting to classify caring behaviors (Hilton, 1997). Benner describes nursing as a caring relationship (Benner, 1984). Benner’s influence surfaced during a discussion on the expertise of nurses ‘from novice to expert’ at negotiating bureaucratic care and developing a climate to provide care in healthcare organizations today (M. A. Ray, personal communication, October 29, 2004). Studies have established a link between caring and positive patient outcomes.

Nursing's caring role evolves out of human need. To meet this need, nurses choose their possibilities. Choices are based on temporal experience and a need to achieve meaningful and purposeful lives with and among others (Johnson, 2000). At the edge of order and chaos is choice. Ray (1994) suggests that caring is a choice "to bring order (healing and well-being) out of chaos (disease, pain or crises)" (p. 26).

Nurses rely on the past – tacit knowledge – as well as spiritual-ethical knowing, caring-presence and technical competency to facilitate moral choice at the edge of chaos, providing care to achieve health, well-being, healing or a peaceful death (Ray, 1994). Inquiry of nursing's role in pediatric pain management must recognize that discovery is guided by sensing the presence of a hidden reality.

Tacit knowledge may be the hidden reality that dictates nursing choices. Polanyi (1967) recognized the tacit dimension of knowing and being. Beliefs precede and undergird knowledge. Tacit knowledge is a pre-logical phase of knowing (Smith, 2003). These informed guesses, hunches and imaginings are not easily shared. "We know much more than we can tell" (Polanyi, p. 4). This statement summarizes the difficulty inherent in capturing and transferring tacit knowledge for clinical practice and inquiry.

While Polanyi provides philosophical framework for discovering the true variables that influence nurses' ability to impact hospitalized children's pain and assure optimal treatment, Polanyi does not provide scientific method that can be transmitted as a logical blueprint for pursing knowledge (Nye, 2002). Instead, at this point, exploration of nursing's role requires a shift of focus from testable knowledge to tacit knowledge. Hegelian dialectic provides a framework for exploration consistent with the evolution of understanding of nursing within the culture of healthcare organizations (Ray, 1989).

Complexity science identifies the universe as interdependent and relational, holistic, complex, and dynamic (Ray, 1994). Complexity science emphasizes that since phenomena are interconnected and dynamic, yet knowledge is limited and approximate, our understanding of reality is restricted and incomplete. Models for studying phenomena with humanistic dimensions are inherently deficient, unable to include all variables that may affect goal attainment. The future is open to possibilities but dependent upon the past, creating unpredictability.

In contrast to complexity science, Newton's third law of motion identifies a simple relationship of phenomena, specifically identifying that for every action there is an equal and opposite reaction. Is the automatic reaction to a child's pain - nursing care to relieve the pain? According to research that indicates children's pain is poorly managed, the answer to this question is no. While nursing acts and reacts to assessments, care planning, interventions, and evaluations, nursing reactions are not the effect of actions, but instead are the result of complex personal and system interactions.

Actions and reactions to pain may be the result of personal, patient and organizational forces that nurses negotiate in the bureaucracy of caring. The basic relationship of action-reaction, however, provides a simplistic framework of nursing performance. By dissecting the nurse-patient relationship, variables necessary to provide nursing care can be identified. If subtleties in interpersonal dynamics and the patient's condition (such as pain) are the action; desire to care, the nurse's response based on experience and knowledge, tempered by intuitiveness, workload and volume, provide the final reaction. The reaction is the performance, the potential for optimal pain relief and pain prevention.

### *2.5.3 Alternative theoretical framework*

Huth and Moore's (1998) prescriptive theory of acute pain management in infants and children provides direction for clinical nursing practice and is presented in Figure 2.1. This theory emphasizes the unique opportunity nurses have to relieve pain for hospitalized children and could be considered an alternative theoretical approach for studying nurses' role in pediatric postoperative pain management. Adequacy of nursing knowledge regarding pain assessment and management and collaboration among healthcare professionals are assumptions of the theory. Pain reduction (rather than pain relief) that is satisfactory to the child, and/or parent and nurse is the desired outcome.

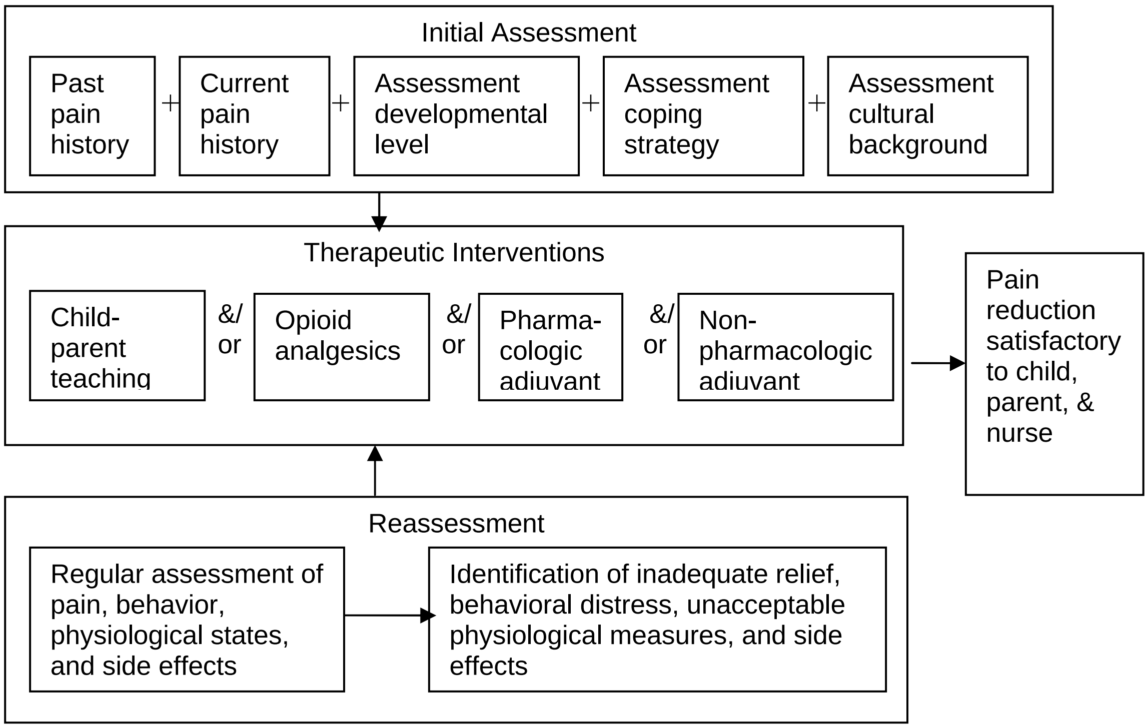


Figure 2.1: Huth & Moore's Model of a Theory of Acute Pain Management in Infants and Children

The focus of Huth and Moore's (1998) theory is the singular interaction of a nurse and a patient. While this is the level at which nursing care is achieved, this model has limited application for the acute care environment since it isolates the nurse and patient outside the influence of the healthcare bureaucracy. Since care of the pediatric patient in acute pain is delivered in a hospital setting, the characteristics of the organization must also be considered. Nursing practice is complex. Competing priorities, forces and barriers from the organization and general culture, beyond workload demands, play into reactions to a child's pain and must be taken into consideration when exploring acute pediatric pain management.

Huth and Moore's (1998) theory fails to illustrate the organizational and cultural factors that impact the delivery of care in healthcare bureaucracies. Therefore, despite the prescriptive nature of the theory, application of the theory to the care of hospitalized children in acute pain continues to rely on the individual nurse's knowledge and beliefs regarding pain management, ignoring the clinical skills required of individual nurses to negotiate for optimal pain relief. The bedside nurse can relieve a child's pain or be the final barrier that leaves the child to suffer.

## 2.6 Gap in Knowledge

The primary motivation for choosing nursing as a profession is to care for others. Yet, estimates suggest that up to 93% of hospitalized children have pain (Huth & Moore, 1998). Despite evidence of pain management knowledge mastery, children continue to receive inadequate analgesia after surgery (Vincent, 2005; Vincent & Denyes, 2004,). Focusing on nursing care choices, 'on the edge of chaos,' to bring comfort in caring for pain is essential. What factors within the dimensions of care persuade or dissuade the nurse from administering analgesics to prevent pain and optimize pain relief? Is it lack of knowledge, conflicting tacit knowledge, beliefs, attitudes or professional, organizational, and general culture that continue to deter pediatric nurses from providing appropriate treatment of pain?

Assessments of nurses' knowledge, attitudes and beliefs have failed to completely explain forces that promote or deter nurses from intervening to relieve children's acute pain. Research reveals inconsistencies between nurses' knowledge and attitudes regarding pain management and actual clinical practice (Dihle, Bjolseth & Helseth, 2006; Ellis et al., 2007; Watt-Watson, Stevens, & Garfinkel, Streiner & Gallop, 2001; Vincent, 2005; Vincent & Denyes, 2004). Several factors such as education level, age, years of experience, personal experience with opioids, and the nurses' ability to overcome barriers have been investigated as influencing pain management decisions. (Ely, 2001; Manworren, 2000; Pud, 2004; Reiman & Gordon, 2007). However, pediatric nurses' clinical practice may also reflect the political and cultural climate and structure of individual healthcare institutions (Berry & Dahl, 2000; Jordan-Marsh et al., 2004; Pasero, Gordon, McCaffery & Ferrell, 1999). Therefore, pain management inadequacies may also be a reflection of nurses' failure to effectively negotiate the bureaucracy of caring. Few studies have explored the complexity of interacting variables that promote or deter nurses from advocating and negotiating the bureaucracy of caring to achieve optimal pain management for hospitalized children experiencing acute pain (Christenson, 2000; Jordan-Marsh et al., 2004; Twycross, 2007a&b; Vincent, 2005; Vincent & Denyes, 2004).

To understand factors that contribute to the continued suboptimal management of pain in children requires a shift in focus from what nurses know (knowledge and beliefs) to what nurses do in the course of caring for a child in pain. What structures and processes do nurses negotiate in their efforts to assess and manage children's pain (Twycross, 2007a&b)? What influence does the bureaucracy and culture of the care environment have on nurses' effectiveness in negotiating optimal pain management? By identifying variables that encourage and hinder or deter nurses from effectively managing children's postoperative pain in clinical practice, further efforts to improve pediatric postoperative pain management can focus on enhancing or controlling these identified variables (Vincent; Vincent & Denyes).

Choices of administering PRN analgesics, choosing between analgesics, and selecting analgesic dosages given a range of management options will provide a basis for inquiry. The nurse is recognized as the negotiator to facilitate care and modulate care decisions to achieve care outcomes. This expands the role of the nurse from investigation within an isolated nurse-patient relationship to the role of care coordinator within a bureaucracy of care.

Pediatric acute pain management within a hospital system provides the opportunity to explore the interplay of the dimensions of bureaucratic caring. Each dimension of care presents a potential impetus or conflict to achieving the care goal. A fuller understanding of the humanistic and bureaucratic dimensions of care in the clinical practice of pediatric pain management will require further definition of each aspect of care. Currently, technologic and physical dimensions are included as bureaucratic dimensions of care; however, humanistic aspects are also involved in defining these concepts for the provision of pediatric pain management. Physical signs of pain may be misinterpreted since they are not specific to pain expression, hence prone to human interpretation and the humanistic dimensions of caring.

The multiple aspects of acute pediatric pain management can be further explored through a qualitative approach toward explaining the interplay of dimensions of bureaucratic care and nursing's negotiations to relieve children's pain during hospitalization. Nursing negotiation of the interplay of the forces and barriers can be observed. Adherence or deviation from care standards can be identified. Nurses' decision-making in regards to administering PRN analgesics when ordered can be explored.

The richness of the qualitative approach to further define specific care dimensions as they relate to pediatric acute pain management in a hospital setting is enhanced by the flexibility to potentially provide quantitative support for the investigation. Quantitative outcomes, such as time from pain assessment to intervention, may provide a summary measure of the interplay of the forces and barriers nurses negotiate to relieve children's acute postoperative pain in the bureaucracy of caring. The ultimate outcome, pain relief, can be quantified by a pain intensity score, functional measures and evaluation of the nurses' performance.

Individuals choose the vocation of pediatric nursing to provide care to children. Pediatric nurses that work in acute care settings have the unique opportunity to relieve pain for hospitalized patients. The bedside nurse can relieve a child's pain or be the final barrier that leaves the child to suffer. Since care is the essence of nursing, choices that leave the child to suffer must be the result of influences beyond the desires of the individual pediatric nurse. The Theory of Bureaucratic Caring provides a unique perspective to investigate this complex phenomenon of acute pediatric pain management within the nurse-patient relationship and the bureaucracy of healthcare. Successful negotiation of dimensions of care should result in optimal pediatric pain management.

# CHAPTER 3

# PROCESS OF INQUIRY: RESEARCH DESIGN AND METHODS

This study sought to bridge the gap of pediatric nurses' knowledge of pain management principles and translation into clinical practice by describing pediatric nurses' negotiation of the bureaucracy of caring to efficiently assess and intervene in efforts to relieve or reduce children's acute post-operative pain. A qualitative descriptive study of human factors engineering and ethnography was used to identify influential variables on time from assessment to intervention and to describe how nurses negotiate the complexities of the bureaucracy of caring.

## 3.1 Specific Aims

The specific aims of this study were to explore how pediatric nurses negotiate the bureaucracy of caring to relieve children's acute post-operative pain on a pediatric post-surgical care unit.

Aim #1: Describe pediatric nurses' actions to assess and manage children's acute post-operative pain on a pediatric post-surgical unit with PRN analgesics and biobehavioral (non-pharmacologic) interventions.

Aim #2: Categorize factors observed to influence pediatric nurses' abilities to care for patients using the seven dimensions of bureaucratic caring: (1) political, (2) technologic/physiological, (3) economic, (4) legal, (5) spiritual/religious, (6) social/cultural, and (7) educational.

Aim #3: Describe the specific care dimensions as they relate to acute pain management and how nurses negotiate these dimensions of caring to relieve acute post-operative pain for patients in a pediatric post-surgical unit setting.

Aim #4: Evaluate the interplay of care dimensions and their influence on time of pain assessment to intervention.

## 3.2 Pilot Study

The study design was informed by a pilot study. The pilot study was conducted on a surgical unit at an unrelated free-standing, non-profit, children's hospital in the Southwest United States. The purpose of the pilot study was to test the feasibility of using ethnography and human factors engineering to collect and quantify observations, which describe factors that influence nurses' actions to relieve children's acute post-operative pain on a pediatric post-surgical care unit. Therefore, the sampling plan for the pilot was purposeful based on number of nurses and shifts of observation to achieve maximal variation sampling (Creswell & Plano-Clark, 2007; Liamputtong & Ezzy, 2005).

The pilot study sampling plan had the researcher purposively shadow one nurse at a time for an entire shift, one day shift and one night shift for each day of the week. A different nurse was observed on each shift, each day of the week, for a total sample of 14 different nurses observed. Nurses who consented to participate in the study were selected based on scheduling convenience. Preliminary pilot data analysis suggested that the interplay of the dimensions of bureaucratic caring nurses negotiated and the factors that influenced time from pain assessment to intervention on a pediatric post surgical care unit differed according to surgical schedule and whether the shift of observation was a week day shift, weekend day shift, weeknight shift, or weekend night shift. There was great disparity in the number of nursing care processes performed and time in direct care processes among these shifts. The most likely explanation is a difference in patient care workload among days of the week and shifts.

Previous researchers have scheduled nurse observations at what were described as "key periods for activities relating to pain" (Brown & McCormack, 2006; Manias, 2003; Manias, Botti & Bucknall, 2002; Manias, Bucknall & Botti, 2004, 2005). Observations were limited to two-hour periods. While this is a well referenced approach for conducting observational studies of nurses work, two-hour block time intervals may fail to provide sufficient opportunity to observe how nurses' familiarity with their assigned patients, changes in patients' conditions, and changes in care demands throughout a shift may influence their pain management decisions. This researcher speculated that effectiveness of initial pain management interventions implemented during a nurse's shift or even nurse's efforts caring for the same patient during previous shifts may influence the type and timing of subsequent interventions. Therefore, during the pilot study, the researcher asked whether the nurse had previously cared for the same patient to determine the potential social influence of familiarity. The researcher also planned to observe pediatric nurses throughout their 12-hour clinical shifts. Analysis of the pilot data revealed that some nurses anticipated patients' pain by reviewing charts and medication administration records prior to the start of their shift, and then based on their evaluation of assessments and reassessments of analgesic and biobehavioral interventions' effectiveness during their shifts.

A stop watch was used to map nurses' time during patient care throughout the pilot study. Time, location, pain assessments, pain interventions including medication administrations, biobehavioral techniques, reassessments, interruptions of care and field notes were recorded. The nurse-patient interaction was a key observation of  study. These interactions typically took place in the patients' rooms. Preliminary analysis of the pilot observations suggested that nurses spend up to 19 to 28% of their shift in the patients' rooms. Care activities performed in patient rooms, direct care activities, were primarily assessments, medication administration, non-drug interventions and documentation.

Key observations essential to pain assessment and management practices were recorded and coded. Coding of pilot study observations provided over a dozen themes characterizing nurses' challenges and activities related to pain management, such as ambiguous assessments, priority of surgical site pain over other pain, reliance on parents to report pain and permit analgesic administration.

PRN analgesics and biobehavioral interventions were used to treat pain in the pilot study. Preliminary analysis of pilot study observations suggested that some nurses use biobehavioral techniques rather than analgesics as initial pain management interventions. When these biobehavioral interventions did not achieve appreciable pain reduction or relief, some nurses administered analgesics as a secondary intervention. But, the pilot study outcomes were not always pain relief or even pain reduction. The reverse order of interventions was also observed. The pilot study identified nurses' use of biobehavioral interventions and their timing in relation to analgesic administration as a factor that clearly influenced time from pain assessment to intervention. The nurse was recognized as the negotiator of the bureaucracy of caring who facilitated and modulated care decisions to focus on care outcomes.

Witnessing of analgesic procurement and waste of controlled substances was also indicated as a factor that influenced time from pain assessment to intervention during pilot study observations. Was the nurse's initial biobehavioral intervention chosen because it could be readily implemented and the nurse anticipated a potential delay in securing a witness to provide this patient's ordered analgesic? Cognitive processes could not be captured through observation alone. Therefore, the researcher could only speculate as to what influenced the nurse's clinical judgment and decisions in this pilot.

Based on these preliminary findings, the pilot study procedures were modified. Shifts of observation were limited. Interview strategies were added to glean insight into nurses' critical thinking and decision-making processes.

## 3.3 Research Design

The primary outcome of interest in this study was time from pain assessment to pain intervention. Time of pain assessment was defined as any information that alerted the nurse the patient was experiencing pain, such as but not limited to, a request from the patient or parent for an analgesic, a patient's self-report pain intensity score, or behavioral indicators of pain. Pain interventions of interest for this study were limited to the administration of PRN analgesics and biobehavioral interventions. When pain is treated with PRN analgesics and biobehavioral techniques, nurses are empowered to use clinical judgment in determining intervention type, time, and dose.

This qualitative descriptive study used human factors engineering and ethnography. Human factors engineering is used to analyze clinical care processes and patient care delivery (Potter, Boxerman, & Wolf, et al., 2004). The human factors engineering approach provided a means to identify factors that influenced nurses' timeliness in responding to pain assessments. Ethnography is concerned with describing a group or culture to understand what people do, how they relate to one another, what their rules, customs and rituals are, what they believe and how they interpret their experiences (Cutler, 2004; Liamputtong & Ezzy, 2005). Ethnography involved review of documents, observations, and interviews with members of the group or culture being studied.

### 3.4 Setting

The setting for this study is a 297 bed free-standing, non-profit, pediatric tertiary care medical center in the Southwestern United States that provides care to children 0 to 21 years of age. This medical center was recognized in 2006 as a Magnet-designated organization by the American Nurses Credentialing Center (CCMC, 2010). According to its mission statement, "the Department of Nursing is committed to providing quality care to our patients and families which includes prevention, interdisciplinary collaboration, intervention and evaluation to achieve quality outcomes" (CCMC, 2010). Nursing's philosophy is caring; guided by seven principles: "1) commitment to quality family-centered care, 2) respect for individuality and diversity, 3) combining the art of caring with the science of nursing to provide evidence-based care, 4) collaboration to coordinate care across the spectrum of health and illness, 5) critical thinking in carrying out the nursing process to achieve best practice, 6) provide an environment that supports innovation, learning, mentoring, advancement, and professional development, 7) practicing within and maintaining a safe care environment (CCMC, 2010)."

The medical center has had an anesthesia-based pain management service since 2002. A full-time pain management nurse was added to the team in 2005. The service then expanded from following patients with epidural analgesia to managing some post-operative patients with PCA, patients with challenging post-operative acute pain, and patients with chronic pain. In anticipation of adding a full-time board-certified pain management specialist, an additional full-time nurse was added to the service in 2008. The new medical director joined the team in 2009. The pain management service underwent a rapid transformation. Now the pain management service has an active chronic pain clinic and also sees some patients who had experienced challenging acute post-operative pain in follow-up. Acute pain management services expanded to include nerve blocks and PCAs for patients with medical conditions. The pain management service also provides some palliative care services. The pain management service has developed pain management order sets and revised the current pain management policy. A formal physician ordered consult is required for the pain management service to see patients, but the pain management nurses will provide nurse to nurse consultation for any patient with pain. The pain management nurses also provide nursing education regarding pain and pain management policies as part of clinical orientation and skills week.

The post-surgical department is comprised of two nursing units with 18 patent care rooms on the North unit and an additional 18 patient care rooms on the South unit. Although care is provided on two units, these units are staffed by the same department personnel who rotate between the units. The average daily census for this department is 34.7 and the average length of patient stay is 3.6 days with over 12,600 inpatient surgical admissions per year (O. Chapa, personal communication, November 24, 2008). The surgery schedules are heaviest on Mondays, Wednesdays, and Fridays (O. Chapa, personal communication, March 30, 2009).

### 3.5 Sample and Sampling Plan

In keeping with ethnographic research principles, the defining component of the culture of nursing explored was nurses' responses to indications of children's pain after surgery on a pediatric post-surgical care unit. The unit of analysis was time from pain assessment to pain intervention. Each individual unit of analysis defines a case. Pilot study results suggested that nurses negotiate 6 to 10 cases during a routine 12 hour shift.

Observations and interviews were conducted until additional observations failed to provide new information, or no longer changed the analysis, which are strategies suggested by Cutler (2004) and Liamputtong and Ezzy (2005). Wallace (1989) observed 91 nurse-patient interactions related to pain and Bucknall & Botti observed 316. Other observational studies suggest that saturation should be achieved by observing 6 (Manias, 2003) to 52 nurses (Manias, Bucknall & Botti, 2004) for 18 (Willson, 2000) to 320 total hours (Dihle, Bjoseth & Helseth, 2006), but none of these researchers observed nurses for an entire 12 hour shift (Brown & McCormack, 2006; Manias, Bucknall, & Botti, 2002, 2005; Twycross, 2002, 2007a; Wallace, 1989).

There were 69 Registered Nurses (RNs) and 3 Licensed Vocational Nurses (LVNs) employed on the postsurgical nursing unit (O. Chapa, personal communication, November 24, 2008). Of the RNs employed full time, 26 worked from 06:30 to 19:00 and 26 worked from 18:30 to 07:00. An additional two nurses worked full time days during winter months. Two nurses worked part time days, defined as two shifts per week; one nurse worked four day shifts per month. One nurse worked full time nights during winter months and the remaining 11 nurses worked four night shifts per month. Nurses have worked at the medical center for less than a year to 16 years. Of the 69 RNs, only 4 are male, 2 worked full-time on the day shift and 2 worked full-time on the night shift.

Homogenous sampling was used for this study. As described by Liamputton & Ezzy (2005), homogenous sampling should be used to decrease variation in influencing factors, such as shift of observation; and decrease potential extreme outliers based on nurses' gender, education and experience levels. In order to decrease demographic variability and protect subjects' identities, the study sample was limited to female RNs who provided direct patient care and who did not have a Master's or higher advanced nursing degree. Observations were standardized to day shifts (06:30 to 19:00) on Tuesdays and Thursdays. Therefore, observations for this study were restricted to the 24 female RNs who work full or part time in a direct patient care role throughout the year on the day shift. All female RNs employed on the nursing unit who met inclusion criteria were invited to participate in the study. The two day shift clinical managers were not invited to participate in this study, since they do not provide direct patient care. Charge nurses were included in this sample. Charge nurses are either scheduled to work their shifts in the charge nurse role or in a direct care provider role. For this study, nurses were only observed when they were providing direct patient care. The researcher purposively shadowed one nurse at a time for an entire shift.

Judgmental sampling was also required. The researcher relied on the willingness and availability of the subjects for observation on allocated fieldwork days; and the researcher used judgment about the appropriate members of the culture to observe to obtain information-rich understanding of the phenomenon to address the aims of the study (Cutler, 2004; Liamputtong & Ezzy, 2005).

Nurses' work and their negotiation of the bureaucracy of care was the focus of the study observations, so nurses were considered the only study participants. The nurse-patient interaction was the key observations of this study. Patients' data were collected to characterize the nurses' work, but patients were not identified. Nurses also interact with parents, visitors, physicians, other nurses, and other members of the healthcare team during the study observations. These individuals are identified in the results by role only.

Thus, observations for this study were restricted to the potential sample of 24 female RNs who worked full or part time in a direct patient care role throughout the year on the day shift:

- The researcher purposively shadowed one nurse at a time for an entire shift.
- Observations were on Tuesdays and Thursdays

Observations and interviews were conducted until additional observations failed to provide new information and no longer changed the analysis.

*3.5.1 Criteria for inclusion of subjects:*

All female RNs employed to provide direct patient care on the post-surgical nursing unit and who worked year round during the day shift, except those with a Master's or higher advanced nursing degree, were eligible for inclusion in this study.

*3.5.2 Criteria for exclusion of subjects:*

- Male nurses were excluded from the study
- Nurses were excluded from the study when they were sharing their assignment with a student nurse.
- Nurses who were not employed by the medical center's post-surgical unit year round were excluded from study. This included nurses who were employed on other patient care units at the medical center who floated to the work on the post-surgical unit.

## 3.6 Measures

Time from pain assessment to pain intervention had been identified as the dependent variable of interest, but at this point in the investigation variables that encourage or hinder/deter nurses from effectively managing children's postoperative pain can only be suggested based on the review of the literature and preliminary analysis of the pilot study. Figure 3.1 summarizes the potential predictor variables whose influence on the time from pain assessment to PRN analgesic administration or biobehavioral intervention will be examined. Identification of additional predictor variables is anticipated through the qualitative methods described.

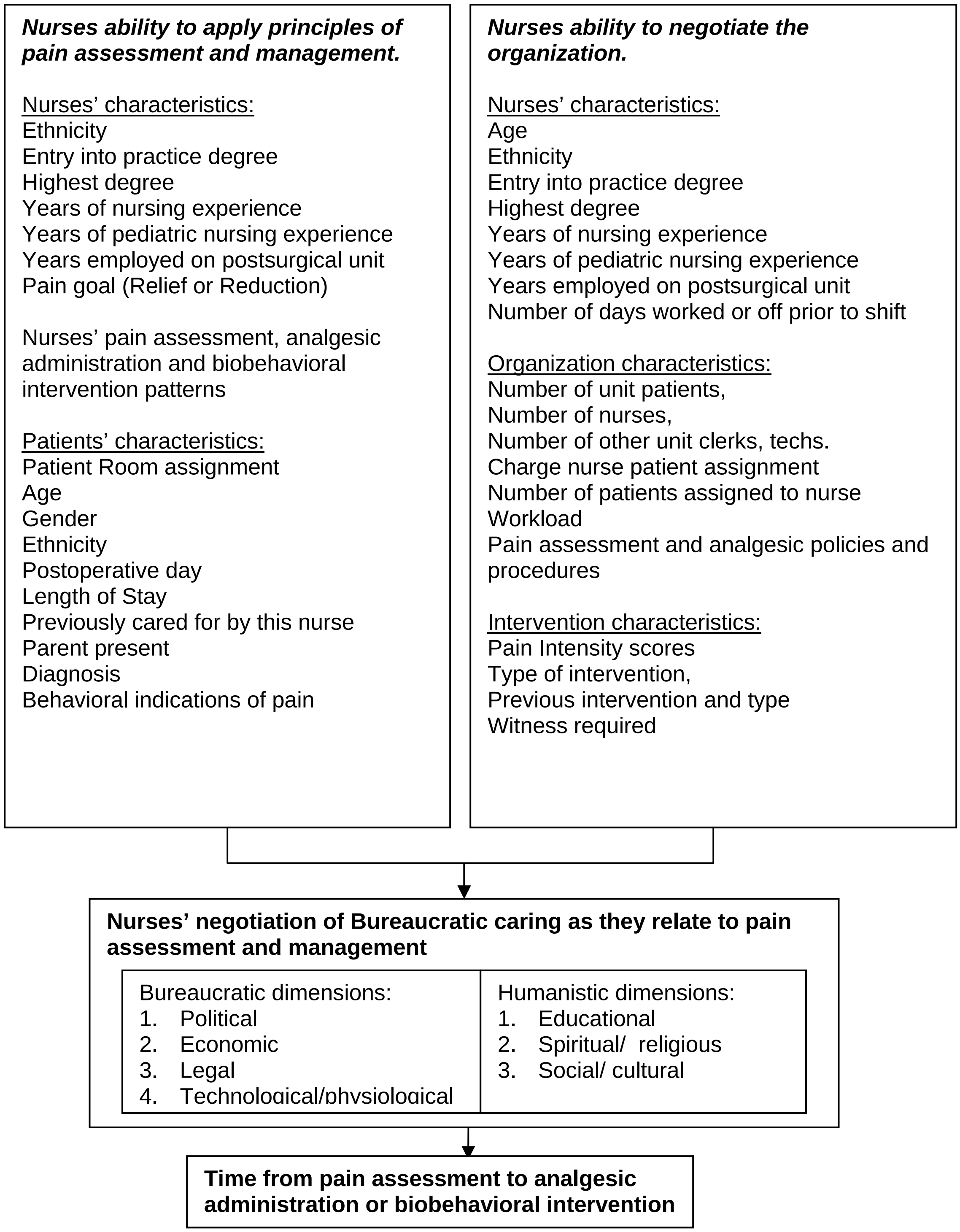


Figure 3.1: Potential Predictor Variables Influencing the Time from Pain Assessment to Analgesic Administration or Biobehavioral Intervention

*3.6.1 Nurses' characteristics: (See Figure 3.1)*

3.6.1.1 Nurses Demographic Information Form (See Appendix B)

Nurses' demographic characteristics, including age, ethnicity, academic preparation, years of nursing, years of pediatric nursing experience, years on the specific pediatric post-surgical care unit, and days worked or off prior to observation, were recorded by the nurse at the time of the shift observation. Validity and reliability testing were not performed on the demographic information form. This demographic form was used in the pilot study that informed the methodology and data collection procedures of this study.

3.6.1.2 Nurses' pain management goals

Nurses were briefly interviewed after each shift to obtain their evaluation of the shift, including their pain management goals and the factors that helped or hindered their efforts to meet those goals. These responses were recorded on the *Time Recordings and Field Notes* pad (See Appendix A).

*3.6.2 Patients' characteristics: (See Figure 3.1)*

Patient demographic characteristics, specifically age, gender, ethnicity, diagnosis, post-operative day, length of stay, parental presence, and nurses' prior experience caring for patients were recorded on the Patient Demographic Information and Location Form (See Appendix C). The location of each patient was also recorded to accurately map the physical requirements of providing care for assigned patients on the nursing unit. Patient data were collected to characterize the nurses' work, but patients were not subjects in the study and were not identified. Patients' demographic data were recorded prior to incoming shift report and as additional patients were assigned to the nurse being observed. Those patients who the nurse interacted with during the shift of observation, but who were not assigned to the nurse, were characterized according to the observed interaction.

*3.6.3 Organization characteristics: (See Figure 3.1)*

Number of patients on the unit, number of nurses, whether the charge nurse has a patient assignment, number of other personnel, such as unit clerks, care partners, students, and number of patients assigned to the nurse observed were recorded by the researcher in the workload section of the Nurses Demographic Information Form (See Appendix B). Other work assignments, (such as committee meetings, assignment to the code team, reconciling the narcotic count, etc.), which may indirectly impact patient care and nurse workload, were recorded by the researcher when the work was assigned and when it was completed.

*3.6.4 Intervention characteristics: (See Figure 3.1)*

In order to capture observation data a *Time Recordings and Field Notes* pad was used for each shift of observation. Running time was recorded in the left margin. Key observations essential to pain assessment and management practices were recorded and coded based on the pilot study, which informed the methodology and data collection procedures of this study. Nursing processes and work tasks identified in previous studies such as assessing, planning, intervening, consulting, delegating, educating, medication administration, witnessing, documenting, hunting and gathering supplies and equipment, interruptions, delays, hand-offs, breaks, and travel to accomplish care tasks were coded next to the running time and recorded during the observation. Pain assessment dialogues were quoted verbatim. The researcher's observations of patients' behavioral indications of pain were also noted. Observations of interventions, including choices of analgesics available to the nurse and the observed patient responses to biobehavioral interventions were recorded.

After interventions, nurses were asked to share their thoughts regarding pain assessment and management observations. Clarification questions were used to gain insight into nurses' decision-making processes (See Appendix A). These responses were recorded on the *Time Recordings and Field Notes* pad.

## 3.7 Procedures

A pilot study informed the methodology and data collection procedures for this study, including procedures for recruitment, consent, observation scheduling, and data collection. The settings for the pilot study and this study, however, are surgical units at unrelated children's hospitals.

### *3.7.1 Recruitment and consent*

All pediatric nurses employed on the post-surgical nursing unit were invited to participate in the study during two staff meetings. At that time, study procedures were reviewed (See Appendix D), consent forms were distributed, and questions regarding the study and consent forms were answered. Nurses were informed that the focus of the study was observation of their clinical care and factors that influence their pain assessment and management of post-surgical patients during a routine 12-hour shift. Further recruitment efforts focused on researcher and clinician work schedules. Nurses were contacted individually to gauge the nurse's interest in participating in a shift observation up to four weeks prior to the day of clinical observation. Nurses who agreed to participate in the study were selected based on scheduling convenience. Consent forms were signed immediately prior to the observation.

### *3.7.2 Shift observation*

Nurse subjects completed the top section of the *Nurses Demographic Information Form* (age, ethnicity, academic preparation, years of nursing, pediatric nursing experience, years on the specific pediatric post-surgical care unit, and number of days worked or off prior to shift of observation) at the time of the shift observation (See Appendix B). The researcher completed the workload section of *Nurse Demographic Information Form,* as well as the *Patient Demographic Information and Location Form* for each patient assigned to the nurse observed (See Appendixes B & C). Patient demographic characteristics (age, gender, ethnicity, diagnosis, post-operative day, length of stay, and parental presence) were recorded prior to the incoming shift report and as additional patients were assigned to the nurse being observed on the nursing unit. Those patients who the nurse interacted with during the shift of observation but who were not assigned to the nurse were characterized according to the observed interaction on the *Field Notes.* Other work assignments that may have indirectly impacted patient care and nurse workload were recorded by the researcher on the *Workload Form.*

Pediatric nurses were observed throughout their clinical shift while providing care to patients on the pediatric post-surgical unit. Pain assessment and management efforts were observed. A stop watch was used to map nurse's time during patient care. The stop watch was able to store up to 100 split times. This allowed the researcher to let the clock run while marking aspects of care that may have influenced time from pain assessment to intervention, such as but not limited to travel time, time to obtain a witness, and time providing a biobehavioral intervention. Time, location, pain assessments, interruptions of care, pain interventions, and field notes were recorded as a running account on a separate pad of *Time Recordings and Field Notes* for each nurse observation. These data and observations were recorded in real time and reviewed for completeness immediately after the shift of observation.

Care actions were timed and documented. Nurses' pain assessment, analgesic administration and biobehavioral intervention patterns were observed and recorded. Behavioral indications of pain were observed by the nurse researcher, clarified in the post-intervention interviews, and recorded. Interruptions in care that hinder nurses' efforts to promptly attend to children's postoperative pain were also observed and recorded. Clinical outcomes such as pain assessment data, patient behavior, medications administered and care rendered were recorded to identify clinical variables and describe nurses' efforts to relieve children's postoperative pain during a typical patient care shift.

### *3.7.3 Post-intervention and post-shift interviews*

Nurses were asked to share their thoughts and clarify their actions after pain management interventions and after the shift to glean insight into nurses' decision-making processes, specific influences or difficulties encountered, which may have affected the nurses' pain management decisions (See Appendix A). Nurses' pain goals were solicited in the post-shift interview. These were noted on the *Time Recordings and Field Notes.*

*3.7.4 Additional ethnographic data*

Pain assessment and analgesic policies and procedures were examined in keeping with ethnographic research principles. Clinical tools, processes, policies and systems that supported and encouraged pediatric nurses to assess and manage pain were identified and reviewed for adherence and discrepancies with clinical observations. Variances of policies and procedures with observed practices are highlighted in analysis.

## 3.8 Data Analysis

The primary outcome of interest in this study was time from pain assessment to pain intervention. Time of pain assessment is defined as any information that alerts the nurse that the patient is experiencing pain, such as but not limited to, a request from the patient or parent for an analgesic, a patient's self-report pain intensity score, or behavioral indicators of pain. Pain interventions of interest for this study were limited to the administration of PRN analgesics and biobehavioral interventions.

Key observations essential to pain assessment and management practices were captured and coded. Five phases of exploration of qualitative data analysis were completed: (1) the initial reading through and review of the individual shift observations, (2) the reading through of the pain assessment to intervention intervals, (3) the second reading through of individual shift observations, (4) constant comparison of additional shift observations with previous observations, and (5) a final review of all pain assessment to intervention intervals across the study. Four levels of coding were required to analyze the qualitative data: (1) coding of nursing processes, (2) coding to describe how nurses' assess and manage children's acute postoperative pain on a pediatric post-surgical unit, (3) coding of influencing factors, and (4) categorizing influencing factors according to seven dimensions of bureaucratic caring.

Field notes were initially coded while recorded to flag pain assessment and intervention data. Nursing processes and work tasks, such as assessing, planning, intervening, consulting, delegating, educating, medication administration, witnessing, documenting, hunting and gathering supplies and equipment, interruptions, delays, hand-offs, breaks, and travel to accomplish care tasks were coded while recorded. Secondary verification of the first level of coding of qualitative data began immediately after the observation. Secondary verification involved reading through all notes and verifying that all pain assessment and intervention observation data were flagged and all nursing processes and work tasks were coded. The data were then transcribed into a password protected Microsoft Excel database. This completed the first phase of data exploration.

During the second phase of data exploration, pain assessments to intervention intervals were reviewed. Data were simultaneously coded to describe how nurses' assessed and managed children's acute postoperative pain. This second level of coding involved writing a phrase or statement to characterize the observations. This level of coding was influenced by the literature review and results of the pilot study, which provided over a dozen themes characterizing nurses' challenges and activities related to pain management, such as ambiguous assessments, priority of surgical site pain over other pain, reliance on parents to report pain and permit analgesic administration. The phrases or statements were compared to similar events within the shift observation and grouped into categories. This completed the second phase of data exploration.

The entire shift observation was then reread for a second time. Each pain assessment to intervention interval was explored for influencing factors as the third phase of data exploration. These influencing factors were coded to allow the data to be compared, interrelated and further analyzed to identify relationships. For example, nurses' use of biobehavioral (non-pharmacologic) interventions and their timing in relation to analgesic administration is an influencing factor that was identified during the pilot study. The regulatory or organizational requirement to witness certain analgesics was also identified as influencing time from pain assessment to intervention during the pilot study. Initial identification of influencing factors completed the third level of coding.

The Director of Nursing Research at the study site reviewed the transcribed observations and interviews. She also reviewed the initial coding of nursing processes, descriptions of nurses' pain assessments and management interventions and influencing factors for consistency of themes and descriptions. Differences were reconciled and the codes were further refined. This completed the third phase of data exploration.

The fourth phase of data exploration was ongoing throughout the duration of observations with a constant comparison of additional shift observations with previous observations. Observations and interviews were conducted until additional observations failed to provide new information or no longer changed the analysis, as suggested by Cutler (2004 and Liamputtong and Ezzy (2005). When no new information emerged, this phase of data exploration was considered complete. The collated observational data were given to the Director of Nursing Research at the study site who reviewed the coded data for consistency of themes and descriptions.

During the fourth level of coding, the researcher and the Director of Nursing Research at the study site independently categorized influencing factors according to seven dimensions of bureaucratic caring: (1) political, (2) technologic/physiological, (3) economic, (4) legal, (5) spiritual/religious, (6) social/cultural, and (7) educational. Differences in categories were reconciled through consensus. This allowed the researcher to analyze how factors observed to influence pediatric nurses' abilities to care for patients, categorized into the humanistic and bureaucratic dimensions of caring as defined by Ray (1989).

In the fifth and final phase of data exploration, all pain assessments to intervention intervals were reviewed. Coding of nursing processes, how nurses' assess and manage children's acute postoperative pain, and influencing factors were compared for each subject and between subjects for consistency.

Descriptive statistics were used to analyze the time requirements and frequency of nursing processes, how nurses' assess and manage children's acute postoperative pain, influencing factors, and care dimensions. Descriptive statistics were also used to analyze the frequency of nurse and patient demographics, and the outcome variable, time from pain assessment to intervention. This analysis is supported by quotes and descriptions of pain assessment and intervention interactions between nurses, patients, family members, and other healthcare professionals obtained during observations.

## 3.9 Ethical Considerations

Nurses' work and their negotiation of the bureaucracy of care was the focus of the study observations, so nurses were considered the only study participants. All nurses employed on the nursing unit who met inclusion criteria were invited to participate in the study. Written informed consent was obtained from eligible nurses before observations began. Nurses' demographic data were recorded at the time of the shift observation but de-identified in study reports to assure nurses' anonymity.

The nurse-patient interaction is a key observation of this study. Patient data were collected to characterize the nurses' work, but patients were not identified. Patients assigned to the nurse were described by age, gender, ethnicity, diagnosis, post-operative day, length of stay, and parental presence. These data were collected prior to incoming shift report and as additional patients were assigned to the nurse being observed. Those patients the nurse interacted with during the shift of observation were characterized according to the observed interaction.

It was anticipated that nurses would also interact with parents, visitors, physicians, other nurses, and other members of the healthcare team during the study observations. These individuals were not subjects of the study and were only identified during observations by role.

Pediatric nurses were the sole subjects in this study; however, any nurse who did not consent to participate in the study, but interacted with the nurse being observed, was identified only as “a nurse”, “a charge nurse”, or “a clinical manager” to reflect their role in the organization in the recordings of the interaction observation in a similar manner to how the roles of other healthcare team members were recorded.

*3.9.1 Risk protections*

The nurse researcher acted as an observer during the study; however, the consent specified that if the nurse researcher observed a dangerous, illegal, or unethical practice, she would intervene to protect the patient and nurse from harm (See Appendix D). These practices may have required reporting consistent with state and federal regulations. The researcher had planned to drop from the study, any shift observations which required the researcher to intervene due to dangerous, illegal, or unethical practices. No dangerous, illegal, or unethical practices were observed. It was anticipated that the researcher would also observe some less than best practices in pain management. Since intervening in these circumstances may alter the factor influences being studied, the nurse researcher merely recorded these observations with the goal of identifying practice improvement opportunities after analysis of all observations.

*3.9.2 Research oversight*

All research activities are subject to oversight by the Institutional Review Boards of Cook Children’s Medical Center and the University of Texas at Arlington (UTA) to ensure complete compliance with all institutional, State and Federal guidelines for ethical research activities. Completed consent forms and observation schedules are secured in a locked file drawer of the Center for Nursing Scholarship and Technology at UTA. These are the only data that identify the study participants. The observation schedules were destroyed when data analysis was complete. The completed consent forms will be secured for the amount of time and in the manner required by the Institutional Review Boards of Cook Children’s Medical Center and UTA.

The researcher's field notes were transcribed by the researcher and remained in the possession of the researcher at all times. These field notes did not identify the nurse observed or the patient, but did include the date of observation and the room numbers of the rooms the nurse entered in order to map the nurse's travels. After transcription, the original field notes were secured in a locked file drawer of the Center for Nursing Scholarship and Technology at UTA. The field notes are secured separate from the consent forms until 2013, three years after conclusion of the study.

The researcher is licensed as a Registered Nurse, recognized by the Texas Board of Nursing as a Pediatric Clinical Nurse Specialist and is board certified in pain management nursing. The researcher's skills in recording qualitative and quantitative data, as well as the feasibility of using this approach of ethnography and human factors engineering to collect and quantify observations which describe factors that influence nurses' actions to relieve children's acute post-operative pain on a pediatric post-surgical care unit were refined in a pilot study. The researcher does not have supervisory responsibilities or management authority for nurses employed at the institution or on the study's postsurgical nursing unit.

The researcher has documented training in the protection of human subjects in research at University of Texas Southwestern (UTSW) by viewing on August 9, 2000 "Protecting human subjects: The Belmont Report," a film produced by the National Library of Medicine for the National Institutes of Health and the Food and Drug Administration. The researcher has satisfied the National Institutes of Health (NIH) human subjects training requirements for obtaining federal funds by completing the Human Participant Protection Education for Research Teams online course sponsored by the NIH on September 24, 2005. The researcher completed basic required training modules of the human research curriculum from the Collaborative Institutional Training Initiative (CITI) January 24, 2008. On June 24, 2009, the researcher completed the 13 required CITI annual update modules. The researcher has also completed HIPAA training required by UTA and Cook Children's Medical Center.

## 3.10 Summary

The purpose of this study was to describe factors that influence nurses' effectiveness in negotiating healthcare systems to assess and treat hospitalized pediatric patient's acute pain. Care is the focus of nursing, so the nurse-patient relationship is at the core of this investigation. Caring for a hospitalized child in pain requires relieving or reducing the child's pain. Previous research has evaluated nurses' knowledge and attitudes regarding pain, pain assessments, and the amount of analgesics administered to infer efficacy of pain management. A qualitative descriptive approach of human factors engineering and ethnography was used in this study to describe the complexity of nurse, patient, and healthcare system variables and interactions.

# CHAPTER 4

# RESULTS

This study sought to bridge the gap of pediatric nurses' knowledge of pain management principles and translation into clinical practice by describing pediatric nurses' negotiation of the bureaucracy of caring to assess and intervene in efforts to relieve or reduce children's acute post-operative pain. A qualitative descriptive study of human factors engineering and ethnography was used to identify influential variables on time from assessment to intervention and to describe how nurses negotiated the complexities of the bureaucracy of caring.

Observations and interviews were conducted until additional observations failed to provide new information or no longer changed the analysis, as suggested by Cutler (2004) and Liamputtong and Ezzy (2005). When no new information emerged, three additional observations were conducted to confirm data saturation, for a total of 14 shift observations of 14 different nurses. Nurses were observed from October 22, 2009 until January 7, 2010. Half of the observations were on Tuesdays and the other half were on Thursdays. Nurses' shifts ranged from 12 hr 9 min to 13 hr 32 min for a total of 175.5 hours of observation.

## 4.1 Cases: Pain Assessment to Intervention Intervals

A total of 143 nurse-patient pain assessment interactions, which may or may not have led to pain interventions, were observed (Table 4.1). In addition, nurses interacted with patients to plan their pain management interventions and educate the patients and their families regarding pain assessment and management during hospitalization and after hospital discharge. Nurses spent 17 min to 180 min for an average of 83 min or 11% of their shifts in care activities related to pediatric pain management on a post-surgical care unit.

Table 4.1: Nurses-Patient Pain Assessment Interactions

| Nurses-patient pain assessment interactions | Total = 143 |
|---|---|
| Cases: Pain assessment to intervention interval (see Tables 4.2 & 4.3) | 58 |
| Pain assessment indicated patient not in pain | 25 |
| No intervention for pain (see Table 4.4 for more details) | 22 |
| Care of medical patients' pains | 25 |
| Use of schedule analgesics or pain technologies | 13 |

In this study, each nurse negotiated 0 to 10 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention **cases** during the observed shift, for a total of 58 cases and a mean of 4.1 cases per observed shift. Five nurses intervened every time they were alerted to their patients' pains. One nurse did not have any patients with pain; therefore no pain assessment to intervention intervals was able to be identified during her shift. Of the 58 **cases**, pediatric Registered Nurses intervened with analgesics 43 times (Table 4.2) and biobehavioral interventions 15 times (Table 4.3).

There were 25 times, 0-4 times per shift, when patients were not in pain and no intervention was required for this initial pain assessment or reassessment, for a mean of 1.8 times per shift. Two of the nurses never reassessed their patients for pain, despite having three cases each.

Nurses assessed patients for pain and did not intervene when alerted to their patients' pains 0-5 times per shift for a total of 22 times and a mean of 1.6 per shift (Table 4.4). There were seven reasons nurses did not intervene when alerted to children's post-surgical pain. The most common reason was because reassessments were too soon after the administration of an analgesic. Either it was too soon to evaluate peak effectiveness of the analgesic; or it was too soon for the nurse to provide another ordered analgesic intervention.

Table 4.2: Cases: Pain Assessment to Analagesic Intervention Intervals (Age is in years, unless designated as w for weeks or m for months, X means not applicable, Previous interventions: A, analgesic or B, Biobehavioral, Time is in min:sec)

| Shift | Pt | Age | Time to intervention | Assess-ment | Previous | Consult | Interrupts & Delays | Triage | Travel | Witness | Gather | Oral | IV push |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6 | 1 | 07:21 | FLACC 2 | x | x | x | x | 00:55 | 02:07 | X | X | 01:38 |
| 1 | 6 | 1 | 11:26 | Crying | A | x | x | x | 00:31 | 05:57 | X | X | 02:24 |
| 1 | 6 | 1 | 16:40 | FLACC 0 | A | x | 2:03 | 05:52 | 00:57 | 01:06 | X | X | 05:08 |
| 1 | 15 | 9 | 04:06 | Whines FLACC 5 | x | 2:00 | 0:21 | x | 00:06 | 03:13 | X | X | X |
| 2 | 1 | 2w | 05:24 | X | A | X | x | x | 00:42 | X | X | X | X |
| 2 | 2 | 10 m | 21:35 | Crying, FLACC 4 | x | X | 1:40 | x | 00:36 | 03:10 | 01:45 | 07:40 | X |
| 3 | 11 | 16 | 15:05 | 7 | A | 1:01 | 3:45 | X | 00:50 | 02:13 | X | X | 02:10 |
| 3 | 9 | 9 | 05:58 | Pt request | X | X | X | X | 00:35 | 01:27 | 00:38 | 01:13 | X |
| 4 | 16 | 1 | 00:00 | Pre-med | X | X | X | X | 00:10 | 02:18 | X | 01:20 | X |
| 4 | 16 | 1 | 10:57 | X | B | X | X | X | 00:58 | 04:11 | X | X | X |
| 6 | 4 | 2 | 18:48 | uh huh (Yes) | X | X | 05:33 | 00:59 | 00:34 | 01:10 | 01:17 | 01:13 | X |
| 6 | 4 | 2 | 48:06 | X | A | X | 37:49 | X | 00:37 | 02:29 | X | 00:19 | X |
| 6 | 5 | 15 | 23:25 | 8 | X | 0:53 | X | 03:59 | 00:54 | 01:40 | X | X | 09:02 |
| 6 | 5 | 15 | 17:49 | 8 | A | X | 00:31 | 00:05 | 00:52 | 02:32 | X | X | 08:32 |
| 6 | 5 | 15 | 05:59 | X | A | X | X | X | 01:20 | 01:16 | X | X | X |
| 7 | 3 | 7 | 23:00 | kinda a 4 | X | X | X | 01:29 | 00:31 | | 04:55 | 01:53 | X |
| 7 | 18 | 6 | 41:58 | Cries | B | X | 02:31 | 30:19 | 00:25 | 02:18 | 01:14 | 00:35 | X |
| 8 | 8 | 6 | 13:38 | Faces 2 | X | X | X | X | 00:35 | 01:21 | 00:40 | 00:38 | X |
| 8 | 8 | 6 | 08:43 | X | A | X | X | X | 00:18 | 01:49 | X | 04:42 | X |
| 8 | 8 | 6 | 04:32 | crying | B | X | X | X | 00:24 | 01:05 | X | 00:32 | X |
| 8 | 18 | 16 | 25:47 | 6 | X | 1:06 | X | X | 00:30 | 02:32 | X | X | 16:14 |
| 8 | 18 | 16 | 02:10 | like a 6 | A&B | X | X | X | 00:24 | 01:26 | X | | X |
| 8 | 18 | 16 | 26:41 | 8 or 9 | A | X | X | 04:31 | 00:28 | 03:35 | X | | 15:02 |

Table 4.2- *Continued*

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 16 | 7 | 07:56 | Nods | X | X | X | X | 00:18 | 01:25 | X | 00:53 | X |
| 9 | 18 | 1 | 08:04 | crying 6-FLACC | X | X | X | 01:02 | 00:10 | 01:30 | X | 00:58 | X |
| 9 | 3 | 2m | 43:34 | crying | B | X | 16:36 | 15:55 | 00:30 | 01:00 | X | 00:31 | X |
| 9 | 3 | 2m | 05:59 | Pt quiet – Mom’s request | A | X | 01:34 | X | 00:55 | 00:51 | X | 00:37 | X |
| 10 | 14 | 16 | 08:41 | 8 | X | X | X | X | 00:39 | 02:45 | 00:22 | 00:29 | X |
| 10 | 14 | 16 | 04:54 | ok | A | X | X | X | 00:25 | X | 00:38 | 01:26 | X |
| 10 | 6 | 15 | 04:45 | a little bit, 4 | A | X | X | 00:44 | 00:21 | 00:39 | X | 00:21 | X |
| 11 | 9 | 9 | 00:00 | X | X | X | X | X | 00:55 | 01:31 | 00:35 | 00:05 | X |
| 11 | 12 | 1 | 10:05 | Check if awake & M wants | X | X | X | 07:57 | 00:22 | 02:02 | X | 02:19 | X |
| 11 | 12 | 1 | 00:50 | Pt asleep | A | X | 00:59 | X | 00:29 | 00:10 | X | 00:17 | X |
| 11 | 12 | 1 | 00:00 | Pt crying | A | X | 01:07 | 02:24 | 00:23 | 03:36 | X | 00:52 | X |
| 11 | 15 | 15 | 00:00 | 0 | A | X | X | 04:34 | 00:32 | 01:02 | X | 03:16 | X |
| 11 | 15 | 15 | 07:42 | itching | A | X | X | X | X | X | X | X | X |
| 11 | 15 | 15 | 00:00 | 1 | A | X | X | 10:20 | 00:30 | 01:48 | X | X | X |
| 12 | 12 | 11 | 00:00 | 7 | X | X | X | 00:11 | 00:29 | 01:38 | 01:07 | | X |
| 13 | 8 | 16 | 06:15 | X | A | X | X | 02:21 | 00:19 | 02:37 | X | 00:17 | X |
| 13 | 2 | 2 | 08:47 | he might be a little | X | X | X | 01:36 | 00:28 | 01:53 | X | 00:38 | X |
| 13 | 3 | 9m | 00:00 | X | X | X | X | X | 00:25 | 02:37 | X | 00:05 | X |
| 14 | 16 | 16 | 03:21 | Like a Wow | X | X | X | X | 00:39 | 01:22 | 00:53 | 00:54 | X |
| 14 | 13 | 5m | 12:11 | X | X | X | X | X | 00:43 | 01:26 | X | 00:26 | X |
| 43 Cases | | | Mean 11:26 | | | 01:12 | 05:22 | 05:31 | 00:32 | 02:01 | 01:16 | 01:17 | 07:31 |

Table 4.3: Cases: Pain Assessment to Biobehavioral Intervention Intervals (Age is in years, unless designated as w for weeks or m for months, X means not applicable, Previous interventions: A, analgesic or B, Biobehavioral, Time is in min:sec)

| Shift | Pt | Age | Time to intervention | Assessment | Previous | Delays | Triage | Consult | Gather | Travel | Witness |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 15 | 9 | 05:58 | It hurts | A | X | x | X | X | x | X |
| 2 | 1 | 2w | 07:24 | Crying, FLACC 3 | A | X | x | 0:00:35 | 01:24 | 00:50 | 02:40 |
| 3 | 13 | 4 | 09:13 | Crying & Kicking | X | X | X | X | 00:45 | 00:52 | X |
| 4 | 16 | 1 | 03:57 | Cries | A | X | X | X | X | X | X |
| 6 | 5 | 15 | 22:42 | X | A | X | 0:19:48 | X | X | X | X |
| 6 | 7 | 2 | 00:00 | Crying | X | X | 1 | X | X | X | X |
| 7 | 2 | 8m | 05:54 | Crying | X | X | 0:05:54 | X | X | X | X |
| 7 | 18 | 6 | 05:10 | Cries | X | 0:01:51 | X | X | X | X | X |
| 8 | 8 | 6 | 03:04 | screams | A | X | X | X | X | X | X |
| 8 | 8 | 6 | 04:59 | screams | A&B | X | X | X | X | X | X |
| 8 | 18 | 16 | 09:27 | X | A | X | X | X | 0:05:42 | 00:50 | X |
| 8 | 18 | 16 | 02:47 | X | B | X | X | X | X | X | X |
| 9 | 3 | 2m | 01:39 | crying | X | X | X | X | X | X | X |
| 10 | 14 | 16 | 00:00 | hmm | A | X | X | X | X | X | X |
| 11 | 9 | 9 | 06:38 | Ow-sobs | A | X | X | X | X | X | X |
| 43 Cases | | | Mean 05:47 | | | | | | | | |

Table 4.4: No Interventions for Pain (*challenging cases, see section 4.5 & Appendix E for more details)

| 22 Cases | Assessments (Pain >0 or 1) | Nurses rationale |
|---|---|---|
| 10 | • 5<br>• 4 or 5<br>• Faces 2<br>• "Ow ow"<br>• "Ow" (screams)<br>• "My arm really, really hurts"<br>• "No, ow"<br>• 6<br>• 8 | Reassessment too soon:<br>• 47 min after morphine *<br>• 17 min after morphine*<br>• 20 min after Lortab<br>• 43 min after Lortab*<br>• 65 min after Lortab*<br>• 12 min after Lortab*<br>• 1 1/2 min after Lortab<br>• 3 min after hydromorphone<br>• 28 min after hydrocodone *<br>• Med due in ½ hour |
| 4 | • 5½<br>• "Ow"<br>• Stirs when incision palpated | Patient dozing<br>Patient asleep<br>Patient asleep<br>Patient asleep when responds to request |
| 3 | • 2<br>• No, 3 or 4 | Patient refused intervention |
| 2 | "cast is hurting" | No analgesic ordered |
| 1 | Just incision | Just incision |
| 1 | | Aunt refused |
| 1 | | Broken promise (rationale unknown) |

Nurses assessed medical patients for pain 0-7 times per shift. Nurses assessed for pain and provided a scheduled analgesic, like ketorolac or ibuprofen up to 3 times per shift; and nurses used a pain technology like patient controlled analgesia to manage the patients' pains up to 2 times in a shift. Care of the medical patients' pains resulted in 25 cases and the use of scheduled analgesics or pain technologies included another 13 cases.

*4.1.1 Time from alert to management influences*

Time from alert to intervention with PRN pain medications or biobehavioral interventions for the 58 cases ranged from 0 to 48 min 6 sec, with a mean of 10 min 51 sec. This section will detail the factors that influence this time range.

4.1.1.1 Immediate response cases

Time from alert to intervention with PRN pain medications or biobehavioral interventions was immediate (no time delay) for nine cases. One nurse intervened immediately in four cases for three patients by using **advanced planning**. She brought the first dose of an ordered analgesic for her initial assessment of one patient. A second patient was crying when she entered the room with the analgesic she had previously discussed bringing as soon as it was due. The infant had been asleep when she previously formulated this plan with the patient's mother. The third patient reported pain scores of 0 and 1 when the nurse brought in the PRN analgesics on a scheduled routine. Three different nurses achieved an immediate time from alert to intervention by **pre-medicating** two of their patients for dressing changes and one of their patients for physical therapy.

Two patients experienced no time delay for intervention because their nurses provided immediate biobehavioral interventions. One nurse attempted to comfort a patient on arrival from the post-anesthesia care unit. The other patient was immediately repositioned by a physical therapist in an effort to promote comfort during a pain reassessment.

4.1.1.2 Confirmation assessment

Nurses assessed patients in response to the calls for pain medications on six occasions, but never more than once on a patient. **Travel** to assess a patient to confirm the need for an intervention added 12 to 13 sec to the alert to intervention time.

4.1.1.3 Consultation and expediting orders

Eight nurses **consulted** or were consulted by other nurses and healthcare providers to make pain management decisions during observations. Nurses also consulted child life specialists, physician assistants and surgeons. Consults resulted in five interventions. Consults added 35 sec to 2 min 37 sec, for an average of 65 sec. However, nurses usually waited until physician assistants and surgeons made rounds to consult. In post-shift interviews, three nurses recognized the cooperation and help of co-workers for facilitating pain management, specifically mentioning charge nurses, pharmacist, unit secretary, and doctors who were friendly.

Six nurses commented in post-shift interviews that having correct analgesics ordered and available facilitated achieving their pain management goals for their patients. Medications were not ordered for two patients and not available for one patient. One nurse tubed an order to the central pharmacy to expedite processing. She explained that even though there are unit based pharmacists, they cover more than one unit; therefore, by tubing the order, it would be processed more quickly.

4.1.1.4 Interruptions, delays and care priorities

Four nurses were **interrupted** six times between being alerted to their patients' pains and intervening. The shortest interruption was 21 sec while a care partner and clinical manager moved a patient bed into the hallway, which prevented the nurse from getting to the patient with an intervention. The longest interruption was 2 min 3 sec to answer a phone call. The average interruption added 35 sec to these alert to intervention times.

Nurses were **delayed** from 59 sec to 37 min 49 sec for an average delay of 6 min 10 sec. Six nurses were delayed nine times. The longest delay was the result of a patient leaving the unit with his Aunt without notifying his nurse. Nurses needed to re-document the medication administration times in the automated dispensing system and electronic medication administration record when the patient returned and was ready for analgesic administration. The adjusted average delay is 2 min 12 sec when this extreme outlier is removed. Two delays were related to waiting in line for the medication room computer and the automated dispensing system. Two delays were the result of looking for patient stickers to label medications. Four other delays were related to the computer system, including two password problems, a nurse leaving before completing the co-sign procedure of the automated dispensing system, and having to wait for pharmacy to add a patient and verify his medications in the computer system.

Isolation procedures also delayed care. Only two patients were in isolation; however, gowning and gloving added another minute to alert to intervention times.

**Triaging care priorities** delayed 9 nurses alert to intervention times in 19 cases. Care priorities ranged from 5 sec to 30 min 19 sec for an average of 6 min 18 sec. While going to get morphine for one patient, the nurse was called to assess her other patient's sudden blotchy red rash. This added 5 min 52 sec to this case. Another nurse took 59 sec to drop off a patient tray. A third nurse responded to a patient alarm, which took 1 min 29 sec. It took one nurse 14 min 49 sec to assess another patient's IV and discuss with the attending physician the possibility of leaving the IV out. In another case, the nurse took 11 sec to get a patient gown.

There was one nurse who took a 16 min 36 sec break between being alerted to a patient's pain and providing an intervention. The patient arrived from the post anesthesia care unit after bilateral inguinal hernia repair. The nurse assessed the patient and encouraged the mother to try to breast feed the infant. The infant continued to cry. The nurse intervened with Tylenol with Codeine 43 min 34 sec after the patient arrived.

4.1.1.5 Analgesic administration

If the intervention was a PRN analgesic, the alert to intervention interval may have included time to travel to gather the analgesic, co-sign controlled analgesics, gather liquids for patients to take with oral analgesics, and administer the oral or intravenous analgesic to the pediatric patient.

Table 4.5: Analgesic Administration Time Influences.

| | Cases | Minimum time | Maximum time | Average time |
|---|---|---|---|---|
| Travel for analgesics | 42 | 6 sec | 80 sec | 32 sec |
| Co-sign controlled analgesics | 39 | 10 sec | 357 sec | 121 sec |
| Gather liquids to take oral meds | 11 | 22 sec | 295 sec | 76 sec |
| Administer oral analgesics | 27 | 5 sec | 460 sec | 77 sec |
| Intravenous push analgesics | 8 | 98 sec | 974 sec | 451 sec |

Analgesics were stored in a centralized medication room. Differences in travel times reflect distance from the patient room and the medication room.

Nurses were required by policy and law to **co-sign** the removal and discard of controlled substances. Nurses typically signed into the electronic medication administration record or the automated medication dispensing machine and then called only once for a co-signer. The co-signer would then sign into the other system. The nurses would then switch to assure they had co-signed the medication in both systems. Nurses always checked the dose against the dose drawn up by the nurse and witnessed the discarding of excess controlled analgesic. Nurses had to call for a co-sign more than once three times during three different shift observations. The nurses waited 70 - 79 sec before recalling for a co-signature. In an effort to expedite this co-signature procedure, four nurses bundled co-signing with other nurses who required controlled analgesics to be co-signed on four occasions. This co-signature procedure then took between 108 and 357 sec, but this actually completed the procedure for two different nurses each time.

The administration of oral analgesics required the **availability of liquids** to wash down the medication. Sometimes the patients had drinks available in their rooms, but nurses had to retrieve drinks 14 times. Usually patients were offered Gatorade, Capri Sun, or a variety of juices to take with these analgesics. Nurses also gathered crackers, graham crackers, cups and straws.

Many patients were **resistant to take oral analgesics**. Nurses tried to disguise the taste and rewarded patients for taking these analgesics. One patient cried, "No, No," but then finished the dose of medication with one squirt from the oral medication syringe. Another patient drank a syringe of Lortab, then sip of Gatorade, and then the second syringe of Lortab to complete the two teaspoon dose. Patients who could swallow pills usually did so in 5 sec or less.

Nurses also administered intravenous opioids over 98 to 974 sec. These analgesics were ordered **intravenous push**. Some nurses pushed the medication at a slow continuous rate, some pushed the medication intermittently over a period of time, and others used a syringe pump.

## 4.2 Setting Description

Time from pain assessment to pain intervention was identified as the dependent variable of interest. Figure 3.1 summarized the potential predictor variables whose influences on the time from pain assessment to PRN analgesic administration or biobehavioral intervention were examined. These potential variables were identified based on the review of the literature and preliminary analysis of the pilot study. Identification of additional predictor variables was anticipated through the qualitative methods described. In this section the nurses' characteristics, patient characteristics, and organizational characteristics will be reported. The influence of these characteristics will also be reported in this section. Nurses' pain assessment, analgesic administration and biobehavioral intervention patterns, as well as intervention characteristics will be reported in the next section.

*4.2.1 Nurses' characteristics (Table 4.6)*

The nurses' ages were skewed with 11 of the 14 aged between 23 and 34 years of age. All but two of the nurses were Caucasians. Six of the nurses had two years of nursing experience, with half of these having worked for another healthcare organization during their initial year of clinical practice as a professional nurse. All but 2 of the 14 nurses had worked as pediatric nurses throughout their career. Half of the nurses had worked exclusively on the pediatric post-surgical nursing unit study site for their entire career of 2 to 15 years of nursing practice.  Two of the three charge nurses had exclusively worked on the pediatric post-surgical nursing unit study site for their entire career, with one being employed elsewhere for her first two years of nursing practice.  This reflects the nurses limited exposure to other nursing care units and other bureaucracies of caring.

Table 4.6: Observed Nurses' Characteristics

| Nurses' Characteristic | Less Experienced (n=7) | Experienced (n=4) | Charge Nurses (n=3) | Total (n=14) |
|---|---|---|---|---|
| Nursing experience | 2-3 years<br>Mean 2.1 | 4-14 years<br>Mean 8.8 | 5-15 years<br>Mean 10.3 | 2-15 years<br>Mean 5.8 |
| Pediatric experience | 2-3 years<br>Mean 2.1 | 2-11 years<br>Mean 5.8 | 5-15 years<br>Mean 10.3 | 2-15 years<br>Mean 4.9 |
| Unit experience | 1-2 years<br>Mean 1.7 | 1-6 years<br>Mean 3.5 | 3-15 years<br>Mean 9.7 | 1-15 years<br>Mean 3.9 |
| Age | 23-30 years<br>Mean 25.6 | 26-60 years<br>Mean 37.8 | 31-57 years<br>Mean 44.7 | 23-60 years<br>Mean 33 |
| Entry degree | 2 ADN<br>5 BSN | 3 ADN<br>1 BSN | 1 ADN<br>2 BSN | 6 ADN<br>8 BSN |
| Current degree | 2 ADN<br>5 BSN | 2 ADN<br>2 BSN | 3 BSN | 4 ADN<br>10 BSN |

Table 4.6 - *Continued*

| | | | | |
|---|---|---|---|---|
| Number of nurses worked or off prior to observation | 4 worked<br>3 off 1-5 days | 3 worked<br>1 off 3 days | 1 worked<br>2 off 3-9 days | 8 worked<br>6 off 1-9 |

All but one of the nurses with greater than three years of experience considered analgesic side effects in making intervention decisions. Only two of the nurses with less than three years of experience considered analgesic side effects in making intervention decisions or had patients who experienced any analgesic side effects. This finding suggests that nurses' years of experience influence their analgesic side effect management. Nurses' entry degrees, current degrees, ages, years of experience, or whether these nurses had worked or were off the day before the observation did not seem to have any other influence on how nurses assessed and managed pediatric post-surgical patients' pains. Therefore, these characteristics will not be included in subsequent sections or categorized into the humanistic dimensions of bureaucratic caring.

*4.2.2 Nurse's pain goals (Table 4.7)*

In post-shift interviews, nurses were asked what their pain goals for the shift were. Nurses were also asked if they felt they had achieved their pain goal during the observed shift. All nurses thought their pain goals had been met, mostly met or partially met. Two nurses listed their pain goals according to the individual patients assigned to their care. All other nurses provided more global responses. The nurse who did not have any patients in pain during her shift was the only nurse whose pain goal was to make sure patients are pain free. She stated her goal was achieved. Other nurses' pain goals and their impression of their success in achieving those goals are listed in Table 4.7.

Table 4.7: Observed Nurses' Pain Goals

| Pain Goal Achieved? | Pain Management Goals |
|---|---|
| Yes | Keep patients **comfortable**, **control** pain before it gets too high |
| Yes | Maintain a level of **comfort** for my patient |
| Yes | Meet patients' expectations |
| Yes | Have them after med administration to have them at therapeutic range **less than five, under control** (This nurse's patients' pain scores after medication administration were a zero or a one.) |
| Yes | • (First Patient): Get off epidural and tolerate oral pain meds and keep pain **below a three or four** (This patient's highest pain score was a two)<br>• (Second Patient): Keep on top of pain with oral or IV pain meds thought might need IV 'cause not on epidural as long and keep **pain less than four** because of his developmental delay and changes (This patient never used a numeric or faces scale).<br>• (Third Patient): Encourage PO intake |
| Yes, I feel it was | Keep them **comfortable** and meet **parents'** goals for the little ones. Making sure goes down to comfortable level, you know they say you **can't get them to a zero**, but the one patient was a zero, so comfortable with activities. |
| I think so | Keep my patients as **comfortable as possible** |
| I think so | Since I had patient yesterday, more control with post-surgical patient. There is going to be **some pain**, but you want it to be **controlled** and **manageable** so they can do ADLs. |

Table 4.7 - *Continued*

| | |
|---|---|
| I think so - the best I could I don't know about (first patient) 'cause she went home but I think I did with (second patient) | • (First Patient): Really just to get her pain under **control**, 'cause it doesn't sound like she had well **controlled** pain because she may have been over-rating her pain. I don't think if you are an eight you can just lay there, maybe if you are a four. But it is not about my perception of pain and her and my perceptions are different.<br>• (Second patient): Make her pain **tolerable**<br>• (Third patient): His pain was **tolerable**<br>• (Fourth patient): Really doesn't complain of pain |
| I think it was, my patients **aren't crying anymore** and (patient) is not **complaining** | Here we like to keep our **pain under a three**, but sometimes you can just keep it **tolerable**, keep them as **comfortable** as possible, you can't make everyone's pain go away, but you can make them as **comfortable** as possible |
| Mostly, I would say | My goal is to **control** pain as best I can and if not working I consult the provider (This nurse did consult a surgeon for one of her patient's pain) |
| Partially, (patient) was my only challenge and by the time I got him his pain was out of control | Get 'em up and walking, I wouldn't expect (patient) up and running but **comfortable** |

Nurses used the words comfortable, tolerable, controlled and manageable when stating their pain goals. Three nurses gave the numerical goal of under a three, but one nurse also gave her second patient a goal of less than a four; and a third nurse gave a goal of less than a five. Nurses also stressed functional goals, such as encourage oral intake, ADLs and walking.

The “Pain” education sheet provided to families on admission does not provide a numeric goal. This education sheet also clarifies, “while all pain cannot be stopped, almost all pain can be reduced (CCHCS: Pain, May 2006).” The hospital’s pain policy states, “Goals will be set according to the patients and family’s background, expectations, and culture,” (CCMC: Policy PS 153, January 2009).

In this study, nurses’ goals for pain management were consistent with the organization’s goals, suggesting alignment with organizational culture. Nurses desired for their patients to be as comfortable as possible, pain managed, and tolerable. For the majority of patients, these goals were achieved.

*4.2.3 Organizational characteristics*

Staffing was consistent throughout the observation period with a range of 14 to 18 patients at the start of each shift for a mean of 16.4 patients and a range of 10 to 18 patients at the end of the shift with a mean of 14.2 patients. The unit was staffed with 5 to 6 nurses per shift with an average of 5.7 nurses. One of these nurses was the charge nurse and did not provide direct patient care. This created a consistent 1:3 or 1:4 nurse to patient ratio at the beginning of the observed shifts. There were two care partners (nurse’s aids) for all but one of the observed shifts and a unit clerk for all but two of the observed shifts. Care partners obtained all vital signs, assisted patients with hygiene and obtained all bedside blood sugars. In addition, care partners performed tasks as delegated by the charge nurse or individual nurses.

Charge nurses had an important hierarchal role in the pediatric surgical unit’s culture. Charge nurses checked and verified all orders, notified nurses of new orders, including discharges, assigned new patient admissions to manage staffing workload, and managed communication with physicians and other clinical departments. Charge nurses were not assigned patients when in charge. This role seemed to insulate staff from care interruptions (See Table 4.8). Charge nurses did provide direct care to patients during shifts when they were not assigned to the charge role. The three charge nurses observed were providing direct patient care, rather than acting as the charge nurse, during their observed shifts.

Table 4.8: Percentage of Time in Nursing Processes

| Nursing Processes | Percentage |
|---|---|
| Documentation | 21 % |
| Cognitive Breaks | 10 % |
| Planning | 9 % |
| Medication Preparation and Administration (excludes co-signing or witnessing) | 8 % |
| Patient Assessment | 7 % |
| Travel | 7 % |
| Interventions | 6 % |
| Handoffs | 6 % |
| Consultation | 5 % |
| Meal Breaks | 5 % |
| Management | 4 % |
| Educate | 3 % |
| Co-sign or Witness | 2 % |
| Delegate | 2 % |
| Hunting and Gathering | 2 % |
| Infection Control Procedures (hand hygiene, gowning, gloving, etc.) | 1 % |
| Interruptions | 1 % |
| Delays & Miscellaneous | 1 % |

Discharges exceeded admissions for all but one shift. Yet, the nurse to patient ratio at the end of the shift was held constant at 1:3 or 1:4, with nurses volunteering to go home in the middle of their shift on two occasions. The observed nurses were then assigned additional patients to even out the remaining nurses' workload. Only one nurse did not discharge any of her patients during the shift observed (See Table 4.9). All other nurses discharged at least one patient. The earliest discharge was at 9:45 in the morning. The majority of discharges were between 10:00 and 14:00. The latest discharge was at 19:02. Of the six nurses who discharged more than one patient, four nurses discharged two of their patients in the same hour. All patients discharged during observations were discharged to their homes, with one patient being discharged to a foster home.

All but one nurses observed admitted at least one patient during her shift. The earliest admission was at 7:02; and the latest admissions arrived at 16:53 and 17:41. The majority of admissions (n=7) arrived between 15:00 and 17:00. Admissions arrived after their discharges for eight of the nurses observed. Patients were admitted from the post-anesthesia care unit (n=7), emergency department (n=2), pediatric intensive care unit (n=2), and directly from physician's offices (n=3).

The nurses observed were assigned to care for a total of 65 pediatric patients, 46 of these were post-operative patients. Each nurse cared for at least two post-surgical patients during the shift.

Table 4.9: Observed Nurses' Workload (Pts = Patients, W = worked the day before observation, O = off work at least the day before observation)

| | Nurse | Assigned Pts | + Admissions | - Discharges | Work or Off | for Pts | Post-surgical Pts | Medical or Trauma Pts | Cases | No Pain | No intervention | Medical, Schedule, PCA or epidural |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Less Experienced | 1 | 5 | 1 | 2 | W | 4 | 3 | 2 | 5 | 4 | 2 | 7 |
| | 2 | 5 | 1 | 1 | 0 | 0 | 3 | 2 | 3 | 0 | 0 | 6 |
| | 3 | 6 | 2 | 3 | 0 | 2 | 4 | 2 | 3 | 2 | 2 | 2 |
| | 4 | 5 | 1 | 2 | W | 3 | 2 | 3 | 3 | 0 | 0 | 3 |
| | 5 | 5 | 1 | 2 | 0 | 0 | 3 | 2 | 0 | 1 | 0 | 3 |
| | 8 | 3 | 1 | 1 | 0 | 1 | 2 | 1 | 10 | 2 | 5 | 0 |
| | 12 | 4 | 1 | 1 | W | 2 | 3 | 1 | 1 | 2 | 0 | 4 |
| Experienced Nurses | 7 | 5 | 1 | 1 | 0 | 1 | 4 | 1 | 4 | 2 | 1 | 1 |
| | 10 | 5 | 1 | 4 | W | 4 | 5 | 0 | 4 | 2 | 2 | 2 |
| | 11 | 4 | 0 | 0 | W | 1 | 3 | 1 | 8 | 2 | 3 | 1 |
| | 14 | 4 | 1 | 1 | W | 3 | 3 | 1 | 2 | 2 | 0 | 0 |
| Charge Nurses | 6 | 5 | 1 | 1 | 0 | 1 | 4 | 1 | 7 | 1 | 3 | 5 |
| | 9 | 4 | 1 | 1 | W | 0 | 3 | 1 | 5 | 2 | 0 | 3 |
| | 13 | 5 | 1 | 3 | 0 | 1 | 4 | 1 | 3 | 3 | 4 | 1 |
| Total | 14 | 65 | 14 | 23 | | 23 | 46 | 19 | 58 | 25 | 22 | 38 |

*4.2.4 Patients' characteristics*

The majority of patients was over 3 years of age and should therefore be able to self-report their pain using standardized and validated pain scales (Table 4.10). The hospital's pain assessment and management policy during the study specified the hospital's standardized assessment tools and the appropriate patients for each tool with the Wong-Baker Faces scale for children 3 to 7 years of age and a numbers pain scale for children older than 7 (CCMC: Policy PS 153, January 2009). All but five patients had parents, guardians, or other family members with them during the entire shifts observed. Only one of the patients was without a parent or guardian for the entire shift and this patient was in child protective services custody.

Table 4.10: Patients' Characteristics

| Patients' Characteristics | Post-surgical n=46 (%) | Medical or Trauma n=19 (%) | Total n=65 (%) |
|---|---|---|---|
| Gender: Male | 18 | 9 | 27 |
| Female | 28 (61%) | 10 (53%) | 35 (58%) |
| Age: Mean | 7.7 years | 7.9 years | 7.8 years |
| <3 years | 19 | 6 | 25 |
| 3-7 years | 4 | 5 | 9 |
| >7 years | 23 | 8 | 31 |
| Range | 2wks to 24yrs | 1 month to 17 years | 2wks to 24yrs |
| Ethnicity/Race: | | | |
| White | 32 (70%) | 10 (53%) | 42 (65%) |
| Black | 10 (22%) | 4 (21%) | 14 (21%) |
| Hispanic | 4 (8%) | 5 (26%) | 9 (14%) |
| Days hospitalized | 0-22 days<br>Mean 3 | 0-29 days<br>Mean 5.5 | 0-29 days<br>3.7 |
| Post-operative day: 0 | 11 | | |
| 1 | 14 | | |
| 2 | 4 | | |
| 3 | 7 | | |
| 4-12 | 10 | | |

The surgical procedures of the patients cared for by observed nurses were varied. The most common surgical procedure was appendectomy (n=7), all of which were done laparoscopically except one. The only other surgical procedures that more than one patient underwent were cochlear implant (n=3) and insitu hip pinning (n=2). While there were no other duplicate surgical procedures, the most common type of surgery was orthopedic.

## 4.3 Pain Assessment and Management

The specific aims of this study were to explore how pediatric nurses negotiate the bureaucracy of caring to relieve children's acute post-operative pain on a pediatric post-surgical care unit. Nurses' pain assessment, analgesic administration and biobehavioral intervention patterns, as well as intervention characteristics will be reported in this section.

Aim #1: Describe pediatric nurses' actions to assess and manage children's acute post-operative pain on a pediatric post-surgical unit with PRN analgesics and biobehavioral (non-pharmacologic) interventions.

The themes that emerged from the content analysis are presented in a sequential format similar to the nursing process. There were four phases commonly observed during pain assessment to intervention intervals: alert, assess, decision, intervention. Other observations and influences related to assessing and managing children's pain on a pediatric post-surgical unit are also described in this section. Influences will be further described and analyzed using the seven dimensions of bureaucratic caring in subsequent sections.

### *4.3.1 Alert*

First, the nurse is alerted to the patient's pain and need for a pain management intervention in four different ways: handoff and shift report, initial pain assessment and reassessments, requests for pain medications, and nurses' pre-medication planning and advanced planning for painful activities or treatments.

#### 4.3.1.1 Handoff and shift report

The number of times a patient received a pain medication during the previous shift and the time of the last dose was reported during **shift report** on all except six post-surgical patients. All but one of these six patients had surgery at least 4 days prior to these shift reports. The patient whose surgery was more recent was a 15 year old white female whose appendix was removed laparoscopically the day before report. The consistency of handoff report is most likely influenced by the unit's use of a standardized report sheet with a section for reporting the administration of PRN medications.

In addition to the written report sheets, nurses verbally reported during shift report to the oncoming nurse when analgesics were administered. This occurred twice during observations. There was one occasion when a nurse identified that her patient received Lortab at 6:43 and this was not reported at shift change.

More commonly the nurses would verbally discuss with the oncoming nurse pain management challenges and concerns experienced during the shift. On two occasions calling the surgeon or anesthesiologist to escalate pain management was reported during formal shift report. These discussions continued face to face between the nurse coming on and going off shift.

In addition, nurses used these **face to face** interactions to discuss inconsistency with their expectations of patients' pain behaviors, patients and family members' pain management expectations, and pain management orders. This occurred on seven occasions. One nurse shared "When she had a chest tube, she only had Tylenol ordered, when her chest tube was d/c'd, they ordered Tylenol with Codeine. Just do whatever her parents want, that's what we do here, isn't it? They are really nice." Usually these reports focused on a patient whose pain was more challenging to control. "Mom said, don't tell him he can have the Dilaudid 'cause he will ask for it all the time." Another nurse shared her concerns about a patient's pain both as she left after her shift and 12 ½ hours later when coming on shift for the next night.

A formal system also exists for reporting analgesics given and analgesic orders when **patients transition** from the post-anesthesia care unit, emergency department, and other patient care units. However, transition report procedure is slightly different based on the unit transferring the patient. The nurses from the post-anesthesia care unit both fax a report and verbally provide a report to the receiving nurse. The emergency department only faxes the report. The pediatric intensive care unit nurses verbally provide a report to the receiving nurses, who can access the patients chart electronically to review care information. Only the nurses from the pediatric intensive care unit transferred the patients and are therefore available to provide further updates and clarification when the patient arrives on the unit. "He hasn't had morphine in 36 hours, Lortab last at noon, Tylenol due at 8PM," reports the transferring nurse. The verbal reports provided 3 opportunities during the 14 observations for nurses to clarify pain management orders and previous interventions.

A formal report system does not seem to be in place for transitioning care when the nurse assigned to patients is at **lunch**, but reporting on patients pain management needs was observed before 5 of the 14 nurses went to lunch. These reports were typically short. "If room 5 complains of pain, start Motrin." Nurses tried to make sure their patients were medicated for pain before going to lunch, "12 might need medicine before lunch, Oh and so does 15, I'll do that first." During two other observations, nurses reported to the charge nurse, "Everyone has been medicated for pain" and "all pain under control and should be no issues." Interventions were given to two patients while the nurse observed was on lunch break.

4.3.1.2 Pain assessments: Initial assessments and reassessments

Report from previous shift did not seem to influence when nurses assessed patients for pain. For example, it was reported in one shift report the nurse's assigned patient had received morphine 3 times with the last dose at 4:30 and another of her patients received a last dose of Vicodin at 22:06 during the previous night shift. The nurse assessed her two non-surgical patients first. The patient who had received morphine was the third of the nurse's four patients to be assessed. This patient was one year old, and it was difficult to determine how the nurse assessed that this patient's pain did not require intervention. An hour and 29 minutes after this assessment, the mother requested morphine for the infant's pain. The patient who received Vicodin was the last patient this nurse assessed; but when asked, this patient refused additional Vicodin for her pain of 2 on a 0 to 10 scale.

However, during initial interactions with parents it became evident that nurses did use this shift report information regarding timing of analgesic administration for planning care. "Mom, she had pain med at 4:50, so she can have more at anytime."

Five of the fourteen nurses performed their **initial patient assessments** by room number order. Only one nurse bundled her initial assessments with other care tasks, like the administration of a scheduled analgesic.

Most nurses completed their initial patient assessments by 8 o'clock. Of the nurses who assessed their patients early, one nurse found two of her three patients in pain, which required intervention as a result of this initial assessment, and another nurse found one of her patients in pain during an assessment at 7:11. This infant patient had last received Tylenol with Codeine at 22:00.

Three nurses did not begin their initial patient assessment until after 8 o'clock. While one of these nurse's patients denied pain or appeared comfortable, another nurse was alerted to her patient's pain during her 8:13 initial assessment and then was paged to address another patient's pain while still attending to the first patient's pain. This nurse had been warned by the nurse going off-shift that both of these patients had challenging pain that had been difficult to control through the night. The third nurse who delayed her initial patient assessments until after eight o'clock emerged from shift report with a timed treatment and then was confronted with new orders and a physician request for assistance to prepare a patient for an unanticipated trip to the operating room. When this nurse was finally able to assess her three post-surgical patients, two were in pain requiring intervention.

There were two other calls to two different nurses for pain medication before these nurses had completed their initial patient assessments. The earliest was a call at 7:38 for a patient one day after laparoscopic interval appendectomy. According to the information provided during shift report, this patient was last given Lortab for pain at 20:05. The other nurse was paged for pain medication at 8:35.

Half of the patients were uncomfortable and required intervention for pain when admitted to the post-surgical care unit. Three of the patients coming from the PACU, one of patients from the emergency department, and one of the patients transferred from the PICU arrived in pain, nurses were delayed in providing analgesics until the orders were entered into the computer. One of the patients coming from the physician's office was in pain and another was in pain about four hours after admission. Neither of these patients had an analgesic ordered for pain.

Of the 46 post-surgical patients, there was no observable pain assessment as part of the initial assessment of 9 patients. One of these patients had a long history of hospitalization and was known as uncooperative with healthcare staff. Seven of these patients were under a year of age. The nurses were, however, observed being alerted to the pain of five post-surgical patients under a year of age. These patients were either crying (four) or the one patient's mother reported her discomfort. The nurses did not intervene for one of these patients' pain. The nurse informed the one mother that the child needed to wait another 45 minutes until it was time for her pain medication.

Of the 19 medical patients, 7 were not assessed for pain during the nurses' initial assessments. Only two of these patients were less than one year old, so the limitation of the observational method does not explain the lack of assessment for these patients. It may be that nurses did not prioritize pain assessment for non-surgical patients. The pain assessment and management policy that was in effect during the study observation period requires "all inpatients should have pain assessment regardless of the type of pain and even in the absence of pain…The presence and intensity of pain should be assessed at the time of admission and every four hours with vital signs, unless the patient is asleep" (CCMC Policy: PS 153, January 2009).

Nurses intervened for 10 post-surgical patients whose initial assessments alerted the nurse to the patient's pain. Seven of these patients were crying during the initial assessment. One 9 year old boy directly asked for pain medication when the nurse initially assessed him after return from surgery. When the nurse moved his fingers the patient woke and jumped and yelled. The nurse asked, "Does it hurt a lot or a little?" The patient's initial response was an incomprehensible, "Uh." The nurse clarified for the patient her expectations, "It's gonna be sore a little." After a short discussion of the plan of care with the patient's parent, the patient asked, "Can I get some pain med, 'cause this thing is hurting right now." The nurse planned to intervene, "Okay, let me get you something and some Gatorade."

A scheduled medication was given in response to the pain identified during one patient's initial assessment. This teenage patient reported pain of a 5 on a 0 to 10 scale at 7:19 the day after a laparoscopic appendectomy. The nurse gave ketorolac and advised ""I have your Toradol - we talked about that yesterday, if you are still hurting we can do something else."

Of the initial pain assessments on the other 12 medical patients, only 1 had pain. On initial assessment of an infant patient admitted with fever, short gut and a central line infection, the nurse states; "I have his meds, how was your night?" Mom responds; "Not good" The nurse clarifies, "Do you think he's hurting or just fussy from being here?" Mom replies, "I can't tell anymore." The nurse requests, "Let me know if you want to try some pain meds, I don't think he's had some in a while, we could try Tylenol or Motrin." Mom replies, "OK." Upon further assessment, the nurse identifies swelling of the patients arm proximal to the IV. The nurse addresses this swelling to relieve the patient's fussiness rather than intervening with an analgesic.

Nurses did not intervene when alerted to patients' pains during the initial assessment of three patients. One alert was a subtle behavior, as the nurse checked the patient's incision and auscultated the patient's abdomen three days after open appendectomy; he stirred, but remained asleep.

Some of the patients' initial assessments clearly indicated the patients were not in pain (see Section 4.5). However, some of the patient's initial assessments indicated the patient had pain, but either the patient did not want an intervention or the pain was not significant enough to alert the nurse to intervene. For example, a 12 year old female one day after laparoscopic appendectomy refused analgesia, "Are you hurting at all?" The patient replies, "Kind of?" The nurse further probes, "What number is it?" The patient softly responds, "Two." The nurse clarifies, "A ten?" The patient and the mother state, "Two." The nurse then, asks, “Do you want Vicodin pills?" The patient refuses, "No." The nurse warns, "Don't wait until it hurts too much." The patient agrees, “OK." This patient was discharged three hours later without intervention or further pain assessment.

**Reassessments** of 15 patients alerted 8 nurses to patients' pain 23 times. Three of these patients were on pain technologies (patient controlled analgesia or epidural analgesia) and the nurse encouraged the two patients on patient controlled analgesia (PCA) to push their button. A fourth patient was a medical patient.

Nurses relied on parents to alert or confirm that a child was in pain during 15 reassessments. A nurse asked, "Is he hurting this morning? I noticed he didn't have any pain med since 9 last night." The dad responded, "He hasn't said he's hurting, but he's been a little whiny – are you hurting - does it hurt? He might be hurting a little" The nurse suggests intervening with an analgesic. ”Let's give him something, has he eaten?" Another nurse asks, “Are you doing OK?" The patient's Mom reports, "She is starting to express a little discomfort" The patient is walking from bathroom crying.

Family members also clarified when intervention was not required in response to behavioral indicators that suggested pain. A nurse asks, "Well did it seem like the medicine worked?" The patient is crying. The Grandmother replies, "Yes." The nurse clarifies, "Then why is he crying." The Grandmother explains, "He wants the milk in the bottle and he has juice."

There were five instances where four different nurses did not intervene when patients clearly alerted them to pain on reassessment. A nurse asked another patient, "What would you rate your pain now?" The patient reports, "6" The Mom and nurse repeat in unison, "A 6?" The patient clarifies, "It's not a 9." The nurse then reassesses the patient another way, "Is your tummy feeling better now that you went?" The patient reports, "A little, but I can feel it working its way down and it's not comfortable." During a later post-shift interview a nurse provides support for not intervening for pain identified on reassessment "Our pain team tells us that a four is comfortable. They don't expect kids to be pain free." Nurses supported not responding to patients' reports of pain by citing behavioral indicators. The nurse asks, "Is that heating pad helping?" The patient replies, "Yeh." The nurse asks, "What's your pain now?" The patient reports, "Five and a half." The nurse questions, "What, five and a half?" The nurse clarifies for the researcher, "As he's dozing off, I'm going to say he is good for now."

4.3.1.3 Request for pain medication

Ten of the nurses were alerted to 14 patients' pains by page 18 times. Twelve of these calls resulted in pain assessment to intervention cases with PRN pain medications or biobehavioral interventions for post-surgical pain. One nurse was called twice to alert her to a patient's pain at 16:07 and 18:40. Three other nurses were called twice to respond to two different patients' pains with each call. One nurse was called four times by one patient for post-surgical pain one day after laparoscopic cholecystecomy. This nurse was alerted by pager to the patient's pain at 8:32, 11:06, 13:04, and 18:01. The nurse had also been alerted in shift report that this patient's pain was difficult to control. Nurses assessed the patients in response to the calls for pain medications on six occasions, but never more than once on a patient. Two of these assessments were also the nurses' initial assessments of the patient.

Nurses were also alerted to patients' pains by requests for analgesics while they were in the patients room assessing and treating patients. Five nurses were alerted to 6 patients' pains in this manner 11 times. Two of these patients had also called for pain medicine at least once when the nurse was not in the room. One patient and his mother requested and received an analgesic or heating pad for pain four times at 15:03:31, 16:08:04, 17:29:29, and 18:07:44. One patient's mother requested morphine as the nurse prepared to leave after completing her assessment. Later that afternoon, this mom requests, "When you come back can you bring some morphine?" The nurse agrees, "Yes." The patient was a one year old female, on her third day of hospitalization after resection intestinal duplication cyst. She was quiet and snuggled close to her mother in bed. Another father of a two week old on her third day of hospitalization after right thoracotomy and excision of sequestration, asked the nurse after providing discharge instructions, "You think she can have some Tylenol before we leave?" Yet during another observation, a grandmother stated after receiving discharge instructions regarding her one year old grandson who had a cochlear implant placed the previous day, "Maybe the nurse will give you pain medicine so you don't hurt so bad and then you will go to lala land on the way home." The nurse did not provide an analgesic for this request.

Nurses were also alerted by another type of call – the sound of crying from outside patients' rooms. Four different nurses responded to four different patients' cries. "Mom, do you think we need pain med?" Mom replies, "Yes, but she may just be mad at me." The nurse clarifies, "You want to give Tylenol this time?" The Mom responds, "Let's give Lortab." Another patient arrived crying. The nurse introduced herself, checked the incisions as the mother comforted the infant with a pacifier and stroking.

A nurse responded to one false alarm. One of the physicians reported "he's hurting." The nurse assessed the patient in response to this report, "Are you OK now that you are situated? Are you hurting?" The almost 10 year old patient replied, "No." The nurse probed further, "Are you sure, cause I can give you morphine."

4.3.1.4 Pre-medication and advanced planning

Ten nurses **pre-medicated** twelve of their patients for potential pain from dressing changes, sitting, walking, and physical therapy. One of the patients was medicated twice for the anticipated pain of two dressing changes.

The most common reason nurses gave for pre-medicating patients for pain was to get them up and walking whether that was with a nurse or prior to physical therapy. A parent confirmed a plan for her son's pain management, "I'm going to try to get him to walk too now that the pain med has kicked in." Patients' experiences may have reinforced nurses' plans to pre-medicate patients prior to walking.

Physical Therapists also planned for the patients to be pre-medicated for therapy. This patient's physical therapist called rather than surprising the nurse and the patient, "I pre-medicated about 40 minutes ago. Not sure where he got crutches, but no gait belt, about 7:45, that's 8:45, 9:45; I don't think it will have worn off." An 11 year old female patient was comfortable at 7:33 the day after insitu hip pinning, "Are you hurting?" The patient replied, "No." The nurse probed further, "What number would you give it?" The patient responded, "A zero." The nurse then explained, "PT will come today, they will call first so we can give pain med before PT. Then if she does well she will probably go home today." At 8:41:19, the nurse informed the patient and her family, "At 10, PT will come so in 30 minutes I can bring your pain med, actually I could give it now." The nurse gave the patient 2 tablets of 7.5mg/500 hydrocodone/acetaminophen at 9:24:41; and at 9:28:01 the nurse asked, "What's our pain level now?" The patient stated, "Seven." The nurse clarified, "Just on thigh where the incision is?" The patient nodded (Yes).

Three nurses pre-medicated three patients for four dressing changes. One nurse discussed the plan to pre-medicate the patient for her dressing change with the initial patient interaction. At 8:43:17, the patient cried as she gave Lortab. At 9:11:17, the patient's mom asked to hold the procedure a little longer since the patient was asleep. The nurse agreed, "I waited 30 minute for the Lortab, I can wait another 30." The nurse performed the dressing change at 10:49:03. The patient cried when her foot was raised, while the wound was flushed and cleaned and with application of Bacitracin. Dad consoled the infant during the dressing change. At 15:19:21, the nurse asked, "I have Tylenol or do you want me to give Lortab?" The mom explained, "She hasn't been sleeping." The nurse decided, "I can give Lortab, it might make her sleepy and then in an hour I am going to show you how to do wound care, since you will do it at home." But ten minutes later, at 15:29:25, the nurse returned and stated, "I'm going to do wound care." Mom asked, "Did you give Lortab?" The nurse replied, "I'm going to give it now." The patient cried throughout the four minute dressing change, but settled as soon as the procedure was complete at 15:36:39.

Six nurses used **advanced planning** twelve times to prevent pain for eight of their patient's pain, rather than reacting to a pain assessment. Nurses planned and provided one to three doses of analgesics for each of these eight patients. Nurses either merely gave the medications when the time interval between doses had elapsed or informed the parents they could ask for the analgesic. "Hey kiddo, I have some pain meds for you." The child life specialist informed the nurse, "He says this is hurting" (points to IV) . The nurse replies, "I'll have you take this and then address your IV. Can you sit up to take this?" An experienced nurse even provided analgesics ordered PRN on a scheduled basis to a trauma patient despite it requiring extra effort on her part. The nurse asked, "Are you hurting?" The patient replied, "No." The nurse informed the grandmother that she was going to pre-medicate him for pain. She informed the patient the medicine doesn't taste great. The patient responded, "I don't want medicine." The grandmother reinforced, "We have to."

When the appropriate time interval between PRN analgesics had passed, nurses asked mothers to alert them when their child was ready for the next dose. "When she wakes we can give her something for pain." The nurse was paged 55 minutes later for a pain medication for the patient.

One of the nurses explained the difficulty in scheduling PRN analgesics. "I wanted to give that baby some pain medicine 'cause that morphine should have worn off by now, but I hate to wake him up to give him Tylenol with Codeine. If he wakes up crying, I'll give him Morphine, if he wakes up and is OK, I'll give Tylenol with Codeine, either way he's getting something." When this nurse reported off to the charge nurse for lunch she stated, “Plan for morphine if wakes up and is fussy. Mom and PNP talked about trying to keep him on pain meds to keep him down- so we want to keep him snockered."

Only one nurse actually delayed medicating the patient for pain twice to keep the patient on the PRN intervals. This nurse determined during her initial assessment that this patient’s pain was returning prior to the time the next dose was due. The mom reported, “She's hurting, we gave her about ten milliliters and she wouldn't take it, she’s hurting.” The nurse informed the mom, "Let me check, I don't think she can have her Lortab until 9:45, but let me check.” It was 9:05:12 at the time of the assessment. The mom stated, "She's sleeping now.” The nurse communicated her plan of care, "OK, so if she wakes up let me know and I can give it. Do you think the pain med is working long enough? The mom replied, "Yesterday, we gave her pain med and we were surprised she drank afterwards, we didn't think she would.” The nurse concluded, "So it works until about the last hour. I will check if maybe we can give her Motrin in between. I'll come back at about 9:45. Let me know if she wakes before then.” Right on time at 9:44:43, the nurse checked to see if the patient was awake and if the mom wanted pain medicine. At 16:43:17, the nurse assisted the mom in giving another oral medication, "Baby if you don't drink we will have to restart your IV. She is due for pain med in about half an hour, maybe that will help?" At 17:16:49, the patient was crying in her dad’s arms when the nurse arrived to give her PRN analgesic.

4.3.1.5 Alert summary

Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention **cases**, pediatric Registered Nurses were alerted to patients post-operative pain during routine initial assessments (10 cases, 2 interventions each for 2 of the patients' assessments) and reassessments (15 cases), requests for analgesics or biobehavioral interventions, i.e. heating pads, when the nurse was not in the patient room (12 cases) and when the nurse was in the room (5 cases), nurses advanced planning (7 cases) and pre-medication for procedures and therapies (6 cases), or when nurses heard crying from the room (3 cases). Nurses' degrees, age, years of experience, or whether these nurses had worked or were off the day before the observation did not seem to influence how nurses were alerted to patient's pain.

Communication between shifts was standardized to alert the oncoming shift nurse to the number of times patients received pain medications during the last shift and the time of the last dose. The consistency of handoff report is most likely influenced by the unit's use of a standardized report sheet with a section for reporting the administration of PRN medications. This information was not reported during the **shift report** of six post-surgical patients, all of whom had surgery at least 4 days prior to these shift reports. This suggested that patients may no longer be routinely receiving PRN analgesics this long after surgery. Nurse to nurse, **face to face,** reports focused on inconsistency with their expectations of patients' pain behaviors, patients and family members' pain management expectations, and pain management orders.

While nurses routinely provided nurses taking over the care of patients with information about the patient's pain management during the previous shift, including difficulties, this did not seem to influence when the nurse assessed the patient for pain or how they reacted to the patients' reports of pain. However, during initial interactions with parents it became evident that nurses did use this shift report information regarding timing of analgesic administration for planning care. Five of the fourteen nurses performed their **initial patient assessments** by room number order. Only one nurse bundled her initial assessments with other care tasks, like the administration of a scheduled analgesic. Five patients were in pain when initially assessed or before assessed by one of the 11 nurses who assessed patients early. Whereas, four of the patients cared for by one of the three nurses who started their initial assessments after 8 o'clock were in pain at or before the time of the assessment.

Of the 46 post-surgical patients, there was **no observable pain assessment** as part of the initial assessment of 9 patients (see Table 4.11). Nurses may have been using an appropriate observational tool to assess the pains of patients under a year of age; and therefore, this researcher's documented lack of pain assessment may merely reflect a limitation of this study's methodology. Of the 19 medical patients, 7 were not assessed for pain during the nurses' initial assessments. Only two of these patients were less than one year old, so the limitation of the observational method does not explain the lack of assessment for these patients. It may be that nurses did not prioritize pain assessment for non-surgical patients despite the pain assessment and management policy requirement for all inpatients to be assessed for pain at the time of admission and every four hours regardless of the type of pain an even the absence of pain. (CCMC Policy: PS 153, January 2009).

Table 4.11: Pain Assessment with Initial Patient Assessment

| Total Patients (65) | Medical (19) | Surgical (46) | Surgical Patient Details |
|---|---|---|---|
| No Pain Assessment | 7 | 9 | - History of hospitalizations<br>- Epidural<br>- Under one year of age (7) |
| Pain Assessed | 12 | 37 | |
| Alerted to Pain Cases | 1 | 10 | - Crying (7)<br>- Asked for analgesic<br>- Throat pain of 7/10<br>- Pain of 5/10 |

Table 4.11 - *Continued*

| | | | |
|---|---|---|---|
| NO intervention for Pain | 0 | 3 | - Patient stirred<br>- "Like a 4 right now-“<br>- Not time |

Some patient’s initial assessments indicated the patient had pain, but either the patient did not want an intervention, or the pain was not significant enough to alert the nurse to intervene. Some patients’ initial assessments clearly indicated the patients were not in pain.

A formal report system does not seem to be in place for transitioning care when the nurse assigned to patients is at **lunch**, but reporting on patients pain management needs was observed before 5 of the 14 nurses went to lunch. **Transition report** procedures differed based on the unit transferring the patient. Verbal reports provided opportunities for nurses to clarify pain management orders and previous interventions.

**Reassessments** of 15 patients alerted 8 nurses to patients’ pain 23 times. Nurses relied on parents to alert or confirm that a child was in pain during reassessments. Family members also clarified when intervention was not required in response to behavioral indicators that suggested pain. Patients were also given a choice of whether the nurse should intervene when pain was identified during reassessments.

There were five instances where four different nurses did not intervene when patients clearly alerted them to pain on reassessment. A nurse explained, “Our pain team tells us that a four is comfortable. They don't expect kids to be pain free.” Nurses supported not responding to patients’ reports of pain by citing behavioral indicators, like sleep.

Ten of the nurses were alerted to 14 patients’ pains by call **requests for analgesics** 18 times. Twelve of these calls resulted in pain assessment to intervention cases with PRN pain medications or biobehavioral interventions for post-surgical pain. Nurses assessed the patient in response to the calls for pain medications on six occasions, but never more than once on a patient. Two of these assessments were also the nurses' initial assessments of the patient. Nurses were also alerted by the sound of crying from outside patients' rooms. Four different nurses responded to four different patients' cries.

Nurses were also alerted to patients' pains by requests for analgesics while they were in the patients room assessing and treating patients. Five nurses were alerted to 6 patients' pains in this manner 11 times. Two of these patients had also called for pain medicine at least once when the nurse was not in the room.

Ten nurses **pre-medicated** twelve of their patients for potential pain from dressing changes, sitting, walking, and physical therapy. The most common reason nurses gave for pre-medicating patients for pain was to get them up and walking whether that was with a nurse or prior to physical therapy. Dressing change was the second most common reason nurses pre-medicated patients.

Six nurses used **advanced planning** twelve times to prevent pain for eight of their patient's pain, rather than reacting to a pain assessment. Nurses either merely gave the medications when the time interval between doses had elapsed or informed the parents they could ask for the analgesic. Only one nurse actually delayed medicating the patient for pain twice to keep the patient on the PRN intervals.

Parents played a significant role in alerting nurses to patients' pains. Parent's either alerted nurses by calling out to request pain management interventions or alerting the nurse while they were in patients' rooms assessing and treating patients. These types of alerts initiated almost 30% of the pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases. Another five of these alerts from parents did not lead to an intervention; and nurses responded to four of these alerts on medical patients or with scheduled analgesics and pain technologies. Nurses alerted parents to the next time an analgesic could be given and asked them to call when the patient was awake or needed the analgesic 10 times during the study observations. Nurses also relied on parents to verify their assessment of patients' pains, provide supplemental information to clarify the patient's pain assessment, or to coach their children to assist the nurse with her assessment efforts over 40 times during the study observations, at least twice for every shift except the fifth shift observation.

The majority of pain assessment and management interactions with parents were with mothers. There are two possible reasons. First, for all but one child who had only one parent present, the mother was that parent. Second, when the mother and father were present, the nurse usually addressed the mother or the mother addressed the nurse regarding the patient's pain. There were only three fathers who took an active role in alerting the nurse to their child's pain, and one of these fathers was the only parent with the patient. Grandmothers' roles were similar to that of mothers', whether the mother was present or not.

*4.3.2 Assess*

Nurses used five techniques for assessing pediatric patients' pains. The hospital's pain assessment and management policy during the study specified the hospital's standardized assessment tools and the appropriate patients for each tool with the numbers pain scale for children older than 7, the Wong-Baker Faces scale for children 3 to 7 years of age, and the FLACC for infants and nonverbal children. (CCMC: Policy PS 153, January 2009). However, nurses used cordial assessments, patients' reports, the numbers scale, the Wong-Baker Faces scale, and behaviors (including the FLACC scale), to assess their patient's pains during the study observations. There was no obvious pain assessment for 17 of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases**.**

Nurses assessed patients from 1 to 19 times per patient per shift for a mean of 8 assessments per patient during the shifts observed. Nurses assessed patients as often as every 2 minutes per patient to as infrequently as every 4 hr 49 min for a mean of an assessment every 43 minutes per patient per shift. Nurses spent 37 minutes in patients' rooms with 11.4 minutes dedicated to assessing patients.

Nurses assessed patients for pain from 0 to 7 times per patient per shift for a mean of 3 pain assessments per patient during the shifts observed. Nurses assessed patients for pain as often as every 2 minutes per patients to as infrequently as every 6 hr 12 min for a mean of a pain assessment per patient every 90 minutes. Post-surgical patients were more likely to be assessed for pain then non-surgical patients.

4.3.2.1 Cordial assessments

Most pain assessments started with a cordial "How are you doing?," or "How are you feeling?," followed by a patient's report or use of the number pain scale. However, some pain assessments were limited to these cordial means. For example, two different nurses reassessed patients asking, "How you doing?" A six year old responded, "Better." The other nurse added to her cordial assessment, "You feel good," but this two year old who was three post-operative days from his appendectomy did not respond. Exclusively cordial assessments were slightly more common with medical patients. Six nurses assessed five medical patients and three surgical patients with cordial assessments. None of the pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases was limited to cordial assessments.

4.3.2.2 Patients' reports

Reports from the patients were the most common pain assessment technique. This technique was used by every nurse and observed 47 times with 21 patients between 2 and 17 years of age. However, this was exclusively the only pain assessment technique used prior to interventions in just four cases. Five additional post-surgical patients between 9 and 16 years of age reported "it hurts," "it hurts really bad," or nodded when asked if they were hurting before being more thoroughly assessed with a standardized pain scale and then receiving interventions.

Patients also reported comfort, "Yes, It's working," "Just the incision," or "No" when asked if hurting. One patient even gave the nurse a thumbs up.

Moms supplemented assessments that relied on patients' reports 12 times. "She had a rough night." "You can be just as uncomfortable at home as you are here. You have to tell them why you don't want to go home." A father supplemented his seven year old daughter's assessment once.

Nurses had a tendency to use leading comments or suggestions when assessing and reassessing patients' pains. Seven nurses made 12 leading comments or suggestions, such as "Any better since the medicine I gave you?" This nurse also asked another patient, "How's your belly feeling, does it hurt when I push on it." The patient replied, "Just the incision." The nurse restated, "Just sore when I push on it?" On reassessment nurses asked, "Is your pain about the same?" "Did your pain medicine make your pain better?" Another nurse asked, "Is your arm fixed?" Nurses even suggested pain scores, "How's your pain now, is it gone, like a 0, or a little bit like a one or a two?" This patient responded, "It's okay." One mother also made a suggestion that may have influenced her son's self-report of pain, "If he doesn't need it, I'd rather he not get pain medicine – You aren't hurting are you?" Her 16 year old son responded one day after hip-pinning, "No."

4.3.2.3 Numbers scale

The numbers pain scale was the standardized pain scale used the most to assess patients' pains during study observations. While there were 23 post-surgical patients over 7 years of age during the study observations, the numbers pain scale was only used to assess and reassess 13 post-surgical patients' pains by 10 nurses. These patients were 11 to 16 years old.

Twelve interventions were provided by seven nurses following the assessment of eight patients with the numbers pain scale. These pain scores ranged from 0-9 with a mean of 6. A nurse intervened for one patient each who provided ratings of 0-1; and another nurse intervened for a patient who reported a pain level of 4. The other nine times patients received interventions, their ratings were 5-9, with a mean rating of 7.4.

Interventions did not follow 11 uses of the numbers pain scale by 9 nurses to assess or reassess 10 patients for pain. These pain scores ranged from 0-8, with a mean of 3.2. Only two of these patients reported a pain level of 0. “Are you hurting?” the nurse asked. “No,” the patient responded. The nurse probed further, “What number would you give it?” The patient replied, “A zero.” Another nurse asked, “Are you hurting? On a 0 to 20?” The patient replied, “0” and laughed “20?” Two patients reported a pain level of 1. One patient reported a pain level of 2. The next lowest pain number scores were, “It is a three or four,” “Like a four,” and “Like a four or five.” “Are you hurting?” the nurse asked. “No,” the patient responded. The nurse probed further, “On a pain scale?” The patient replied, “It is a three or four because my throat is sore.” One patient each reported a pain level of five, six, and eight. “How is your pain level?” The patient replied, “It still hurts.” The nurse clarified, “Still an eight?” The patient agreed, “Yes.” The nurse responded, “PT said they would be here in a little while.”

Pain scores did not always indicate that the patient was comfortable, but at least two nurses provided a reason for not intervening further. When the nurse asked, "How would you say your pain is?" The patient reported, “Like a four or five" The nurse’s rationale, "Well it hasn't been an hour yet.” It had been 16 minutes since intravenous morphine had been given. The patient commented, “It's tolerable.” There was one incident when the patient was asked, “How’s your pain now, did that morphine help?” The patient reported, “Five.” The nurse responded, “Good so coming down.” The nurse documented “states improved,” rather than documenting the actual numbers rating the patient had reported. This nurse stated in the post-shift interview that “nothing” had hindered her ability to meet her pain goal of keeping her “patients as comfortable as possible.” This was not the same nurse who had reported in the post-shift interview, “Our pain team tells us that a four is comfortable.”

Only two nurses explained the anchors of the number pain scale on one occasion each, “On a scale of zero to ten, zero being no pain and ten being the worst pain ever?” The patient reported, “Zero.” Nurses used different anchors for the numbers pain scale, “Can you give me a number between one and ten?" This patient responded, "Seven." The nurse probed further, "And before pain medicine?" The patient replied, "Ten." Three nurses used a zero to ten scale; and three nurses used a one to ten scale. The nurses who used the one to ten scale first determined that the patient was in pain. "Does this leg feel like the other leg?" The patient responded, "Like the back is achy?" The nurse asked, "On a scale of one to ten, how achy?" The patient reported, "Like a one." The other assessments assumed the patients knew the scale, and the responses suggested there was an understanding despite the lack of scale anchors and definition of the anchors (see Table 4.12).

Table 4.12: Use of Numbers Pain Scale

| Nurse assessment | Patient response |
|---|---|
| Can you give me a number between 1 and 10? | 7 |
| Where is your pain level at on a 1 to 10 scale? | 8 |
| On a scale of 1 to 10, how achy | Like a 1 |
| On a scale of 0 to 10, 0 being no pain, 10 the worst ever? | 0 |
| On a scale of 0 to 10, how is your pain? | It's an 8 |
| What is your pain? On a scale of 0 to 10? | Uh, 1 |
| If 0 is no pain and 10 worst, what is your pain right now | Like a 4 |
| Are you hurting? On a 0 to 20? | 0 |
| Before I started this medicine, what was your pain? | It was an 8 |
| Ok, tell me what your pain number is. | It's an 8, 8 ½ |
| How's your pain? Patient responds, "Fine." Nurse repeats, "Fine." | About a 6 |
| What would you rate your pain? | Like a 6 |
| OK bud, how would your rate your pain now? | 8 or 9 |
| What's our pain level now? | 7 |
| How is your pain now, did that morphine help? | 5 |
| How would you say your pain is? | Like a 4 or 5 |

Table 4.12 - *Continued*

| | |
|---|---|
| What would your rate your pain now? | A 6 |
| How is your pain level? Patient responds, “It still hurts.” Nurse, “Still an 8?” | Yes |
| Are you hurting? Patient responds, “No.” Nurse, “What’s your number?” | Just a 1 |
| What number is it? | 2 |
| Are you hurting?  Patient responds, “No.” Nurse, “On a pain scale?” | It is a 3 or 4 |
| Are you hurting? Patient replies, “No.” Nurse, “What number would you give it?” | A 0 |

An education sheet is available for families and provided on admission.  It defines pain and specifies the three scales used to measure pain. The numbers scale is merely described as “a 0 to 10 Pain Rating Scale,” the anchors are not defined (CCHCS: Pain, May 2006).

Mothers provided supplemental information to verify their children’s pain assessments or assisted with the use of the number pain scale on eight occasions. Parents also offered supplemental pain assessment information to alert the nurse to the need for intervention.  In response to being called to a room for analgesic administration, the nurse asked, “Before I started this medicine, what was your pain?" The patient replied, "It was an eight, I was asleep and her phone went off and made me jump.” Mom added, "We waited about 30-40 minutes." The patient concludes, "Then I couldn't stand it."  A nurse was observed explaining the pain scale to a parent and her goal to prevent pain from getting too high, "Let us know when it is a two or three, don't wait until pain is severe.”

4.3.2.4 Wong-Baker Faces scale

The hospital’s pain assessment and management policy during the study specified the Wong-Baker Faces scale was the hospital’s standardized assessment tool for verbal children three to seven years of age (CCMC: Policy PS 153, January 2009). There were nine patients between three and seven years of age, but only four of these were post-surgical patients.  The

Wong-Baker Faces pain scale was only used four times to assess and reassess the pain of three patients, six, seven and nine years of age, by three different nurses. The nurses explained the Wong-Baker Faces scale, but not with the script used to validate the tool. Nurses had Wong-Baker Faces scales hanging from their identification badges, but it did not include the validated script. The patients and parents were also provided a copy of the Wong-Baker Faces scale on the "Pain" education sheet. (CCHCS: Pain, May 2006). This education sheet was also missing the validated script. It said, "Each face is a child who feels happy because they have no pain (hurt), or sad because they have some or a lot of pain. We ask the child to point to a face on the scale they feel most like." The validated brief word instructions are, "Point to each face using the words to describe the pain intensity. Ask the child to choose face that best describes own pain and record the appropriate number" (Hockenberry, Wilson & Winkelstein, 2005). The original validated instructions are, "Explain to the person that each face is for a person who feels happy because he has no pain (hurt) or sad because he has some or a lot of pain. Face 0 is very happy because he doesn't hurt at all. Face 2 hurts just a little bit. Face 4 hurts a little more. Face 6 hurts even more. Face 8 hurts a whole lot. Face 10 hurts as much as you can imagine, although you don't have to be crying to feel this bad. Ask the person to choose the face that best describes how he is feeling" (Hockenberry, Wilson & Winkelstein, 2005).

Assessments with the Wong-Baker Faces pain scale led to two interventions. The nurse clarified with a seven year old during her initial assessment, "Have you been giving numbers or looking at Faces?" The nurse went on to explain, "This is our Faces scale, (nurse shows scale), this is if you aren't hurting, this if hurting a little, this is where we would want to give you some pain medicine, and this hurts a whole lot. You can point." The patient pointed and says, "Kind of a four." The nurse clarified, "Between four and six?" The patient agreed, "Yeh." An hour and 23 minutes later the nurse reassessed the patient after intervention, "How is your pain now? Better?" The patient nodded. The nurse probed further, "What number are you now? (Shows Faces scale). The patient points to the face with the number two under it.

The Faces scale had limited utility with the nine year old patient. Her nurse showed her the Faces scale and asked, “Can you point to which face is yours?” Her mom stated, “She is legally blind, she has no peripheral vision. She can look at it straight on.” The patient replied, “I like the happy face.”

There was one incident in which a nurse did not show the patient the Faces scale, but charted a Face scale of eight. The nurse asked the researcher “Which one has tears in it?”

4.3.2.5 Behaviors, including the FLACC scale

As previously mentioned, nurses intervened for three patients’ pains when alerted by crying from the patients’ rooms. However, crying was actually the assessment for 12 of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases**.** Crying patients were between two weeks and six years old. Additional assessed behaviors that led nurses to intervene for pain were whining, kicking, and screaming.

Parent’s role is also described in the “Pain” family education sheet. “Since a baby or young child cannot always tell us when they’re hurting, parents help us better understand their child’s pain” (CCHCS: Pain, May 2006). It goes on to note, “You know your child better than anyone else and can share with us even the slightest change in your child’s behavior. It is important for us to learn about your child’s past pain history, how your child expresses pain, and past methods (both successful and unsuccessful) that you have used to treating pain.”

Nurses relied on parents to supplement their assessment of patient’s behavioral indicators of pain. At other times, nurses merely deferred their pain assessment of younger patients to the parent’s report. “Has she complained of her neck hurting?" The patient’s mother replied, “No." Another nurse asked a mother who only speaks Spanish, “Does he have any pain, delor?” The mother responded, "No."

A few mothers voiced their uncertainty, "Do you think she's in pain?” The nurse informs this mother of a two month old girl, "It's hard to tell, she may be hurting or hungry, that's why we give the Tylenol.” This mother later acknowledged her lack of expertise regarding her daughter's pain, "She's eating good.  She seems to be doing better with that Tylenol…How long do kids normally need pain medicine?"  The nurse responded, "It depends, everyone is individual we can see if she doesn't need anything every four hours we can hold off a little while and see."  The mother explained, "Sorry I'm asking so many questions, I'm just nervous with her." Another nurse sought verification of the meaning of a patient's cries.  "Mom do you think we need pain med?"  Mom replied, "Yes, but she may just be mad at me."  Mothers who were uncertain in verifying their child's pain behaviors had children less than three years of age.

Three nurses also relied on grandmothers to verify their assessment of patients' pains, provide supplemental information to clarify the patients' pain assessments, or to coach their children to assist the nurse with her assessment efforts.  The nurse commented after the patient is unable to demonstrate use of the Faces scale, "Well, I thought you might be able to show me."  The grandmother clarifies when the patient has pain, 'When he moves only." The two year old boy cries.  Two of the grandmothers were the only family member with the patient, but the third patient was also accompanied by her mother.  This grandmother witnessed the pre-schooler's injury, "She said spleen would swell. How can you tell?  She said she might have more pain.  Like I said, since 11 she has not had pain except her IV.  Honey does your tummy hurt?  She hasn't tried to stand up which isn't normal for her."

There were 11 post-surgical patients less than 1 year of age and 8 post-surgical patients between 1 and 3 years of age. Nurses documented a FLACC score as their pain assessment for five cases.

Nurses' statements support their use of the FLACC pain scale for pain assessments. One nurse mentioned to the researcher that FLACC was used to score the patient's pain because the patient was unable to use the Faces scale.  Another nurse reported, "I have been using FLACC on him, but should use Faces according to his age, but I don't think he can do Faces, so I ask the parents.  It's hard when parents aren't here."  During the last observation, the nurse informed the researcher, "He looks like a 0 FLACC to me."  Nurses also supplemented their documentation of use of the FLACC scale with statements like “denies pain,” “pre-medicated for wound care,” and “caregiver requests pain medicine.”

4.3.2.6 Contributing factors

Movement, anxiety, hunger, and other factors appeared to contribute to patients’ pains and complicate nurses’ ability to obtain an accurate assessment. Parents were warned in the “Pain” educational handout that, “Children may experience pain because of increased anxiety and/or fear. Helping children relax often decreases this pain,” (CCHS, May 2006). Contributing factors complicated 28 assessments of 18 patients by 10 different nurses. Nurses intervened 11 times; with pharmacologic interventions 7 times, repositioning once, and both pharmacologic and biobehavioral interventions three times.

Movement was the most common contributing factor aggravating pain after orthopedic and abdominal surgeries. When the resident physician manipulated a patients fingers one day after open reduction and internal fixation of left elbow fracture, the previously calm 6 year old female patient cried, "Ow." When the nurse repositioned a nine year old male patient three days after excision physeal bar right femur, "I'm going to need help holding cast," the patient jumps, “Oh!"

Some contributing factors are more difficult to identify, "She did great walking yesterday. No pain; and she did it multiple times, so I am not concerned about safety. She's just not feeling well." Another patient’s mom reported, “I don't know what's wrong with her she's just pushing buttons and running around." The nurse asked, "You think she's hurting?" The patient’s mom concluded, "She's just fussy and they brought in a tray and she can't have it." Another nurse assessed another fussy patient, "Is he fussy?" The mother replied, "A little, but I gave him a bottle."

4.3.2.7 Assessment summary

The hospital’s pain assessment and management policy that was in effect at the time of the study observations specified three standardized pain assessment tools (CCMC: Policy PS

153, January 2009); however, nurses used five techniques for assessing pediatric patients' pains.. Nurses used cordial assessments, patients' reports, the numbers scale, the Wong-Baker Faces scale, and behaviors (including the FLACC scale), to assess their patient's pains during the study observations. Nurses' degrees, age, years of experience, or whether these nurses had worked or were off the day before the observation did not seem to influence how nurses assessed patients' pains.

Nurses typically started with a cordial assessment. None of the pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases, however, was limited to cordial assessments. There was no obvious pain assessment for 17 of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases**.**

Reports from the patients were the most common pain assessment technique. However, this was exclusively the only pain assessment technique used prior to interventions in just four cases. Nurses had a tendency to use leading comments or suggestions when assessing and reassessing patients' pains with self-report methods.

Pediatric patients' used standardized self-report pain assessment tools for only 14 of the 58 pain assessment to intervention cases, even though a majority of the post-surgical patients (27) were over 3 years of age. Nurses assessments for the other 21 cases involving patients over three years of age consisted of crying, screaming, or whining (8), requests for interventions (7), patients reports of pain (5), and advanced planning (1). At this age, pediatric patients should be able to self-report their pain using standardized and validated pain scales, but nurses did not rely on these assessment techniques to intervene.

Nurses rarely explained the numeric pain scale to patients, but patients' responses suggested they understood the scale. The pain scores may have influenced nurses' decisions to intervene. Even though a patient with a pain score of 0 and another patient with a pain score of 1 received interventions, the mean pain score for patients who received interventions (6) was higher than the mean pain score for patients who did not receive interventions (3.2). Of note, there was also a 16 year old patient who denied being in pain, but reported a pain score of 3 or 4.

The Wong-Baker Faces pain scale was only used four times to assess and reassess the pain of three patients by three different nurses. The infrequent use of this standardized pain scale is most likely a reflection of the lack of patients between three and seven years of age during study observations. These assessments led to two interventions. Three nurses explained the Wong-Baker Faces scale to three patients, but not with the script used to validate the tool. The faces scale was readily available, but the validated script was not.

Behavioral assessments were used in 21 of the 58 pain assessment to intervention cases, 13 of these cases involved patients less than 3 years of age. Crying was the behavioral assessment for 12 of the 21 cases. Nurses' assessments for the other 10 cases involving patients less than three years of age consisted of advanced planning (6), requests for interventions and pre-medicating patients to prevent pain (3), and patients' reports of pain (1). Nurses documented a FLACC score as their pain assessment for five cases. While the hospital's pain assessment and management policy during the study specified the FLACC scale was the hospital's standardized assessment tool for infants and nonverbal children (CCMC: Policy PS 153, January 2009), this researcher's lack of documented use of this pain assessment tool may merely reflect a limitation of this study's methodology.. Nurses' statements support their use of the FLACC pain scale for pain assessments.

Nurses relied on parents and grandmothers to verify their assessment of patients' pains, provide supplemental information to clarify the patients' pain assessments, or to coach their children to assist the nurse with her assessment efforts. Nurses involved parents in their assessment of patients' pains over 40 times during the study observations, at least twice for every shift except the fifth shift observation. A few mothers of children less than three years of age expressed uncertainty in their ability to verify the reason for their children's distress behaviors.

Movement, anxiety, hunger, and other factors appeared to contribute to patients' pains and complicate nurses' ability to obtain an accurate assessment. Contributing factors complicated 28 assessments of 18 patients. Movement was the most common contributing factor aggravating pain after orthopedic and abdominal surgeries. Pain and anxiety over moving became a vicious cycle (See section 4.5). Some contributing factors are more difficult to identify, but nurses intervened 11 times with pharmacologic and biobehavioral interventions.

*4.3.3 Decision*

Nurses were alerted to the patient's pain but they did not always intervene, which emphasizes the next phase of the pain assessment to intervention process, the decision. Nurses were alerted to the patient's pain and need for a pain management intervention when there were requests for interventions and assessments indicated patients were in pain. Nurses also planned interventions and pre-medicated patients to prevent pain and pain with activities and treatments. However, the decision to intervene was either the patients', parents', or nurses'. Nurses influenced these decisions by advising to avoid severe pain, communicating pain expectations, and breaking promises. Parents and patients influenced these decisions by sharing previous pain and pain intervention experiences. Nurses negotiated analgesic schedules, type of analgesic, analgesic side effects, transition to other methods of managing pain, discrepancies with expectations, and patients' transition to a different level of care. To assist in making pain management decisions, nurses consulted other nurses and healthcare providers.

4.3.3.1 Who decides: Patient, parents, and/or nurses

Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases, 6 nurses let 8 **patients** make the decision that resulted in 16 interventions. Six of these decisions were requests for analgesics or biobehavioral interventions by 9 and 16 year old males and a 15 year old female, all of whom have had previous hospitalizations and previous surgeries. The other decisions were precipitated by four routine reassessments, one patient request, and one incident of advanced planning.

The youngest patient asked to decide was a six years old female. The patient had pointed to the second face when reassessed with the Wong-Baker Faces scale. The nurse then asked, "Do you think you need some medicine?" The patient asked, "But can I have the medicine you can eat and drink with?" The nurse clarified, "It will be the medicine you got this morning." The patient responded, "That made me a little sick." Her mother reassured her, "I think now that you had some sausage you should be OK."

Another patient reassessed by the same nurse reported pain, "About a six." The nurse asked, "Do you want me to give you something?" The patient asked, "What do I have?" The nurse explained, "You have Norco or Dilaudid." The patient reported, "I don't care." The nurse further assisted the patient with the decision, "Which works better for you?" The patient replied, "Dilaudid." The nurse supported the decision of this 16 year old who had been hospitalized for 22 days, "That's a good idea since you haven't eaten anything."

When another patient was in a wheelchair awaiting discharge transportation, the nurse asked, "Do you want Motrin for the road, she has a dose due at noon." While it sounded like the nurse was asking the patient’s mother, the patient responded, "OK."

Patients did not always decide to intervene. Three patients decided not to intervene on four occasions. These patients reported pain of less than a four on the numbers pain scale.

A 16 year old female patient one day after laparoscopic appendectomy refused interventions twice when asked. First, the nurse asked if the patient had been up to walk. The patient explained she walked yesterday, but was really sleepy. The nurse advised, "That will really help you if you walk. It will make you more comfortable and reduce your fever. The nurse also asked, “Are you having any pain?" The patient reported her pain, "Just my belly button and my shoulder, but that's from the gas." On a pain scale the patient rated her pain, "Like a four." The nurse replied, "Like a four right now- OK you know you need to tell me if you need something for pain. I gave you Toradol earlier. You know that is like a strong Motrin." The patient replied, "I was going to walk after breakfast." The nurse repeated, "OK, let me know if you need anything." Fifty-four minutes later, the nurse asked, "So are you going to get up and walk? Is your pain about the same?" The patient stated, "Yes," The nurse asked again, "Do you need any pain medicine?" The patient replied, "No." The nurse reminded her, "Don't forget to tell me." An hour and 30 minutes later, the patient's mother came to the nurses' station and stated, "She's ready (for pain medicine)."

A nurse delayed one patient's decision for further intervention for a pain score of 5, "I have your Toradol - we talked about that yesterday and then if you are still hurting we can do something else. How is your nausea? Are you hungry?" The patient replied, "Yes." Her mom responded, "She wants pancakes, we'll see if she's ready, but she's been doing well, she's been up to the bathroom by herself and walking all around." The nurse reviewed playroom and activities planned for the today.

It was far more common for nurses to let **parents** decide whether or not to intervene for patients' pains. Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases, 9 nurses relied on 14 parents to make the decisions that resulted in 25 interventions. Fourteen of these decisions were precipitated by requests for interventions, six by routine assessment and reassessments, and the remaining five involved pre-medication for procedures and advanced planning.

A nurse asked, "Is she asleep?" The mother replied, "Yes." The nurse deferred the decision to intervene to the mother, "It has been right at four hours, do you want to give this or wait?" The mother responded, "We can give it."

Nurses coached parents to ask for analgesic interventions, "If she is really hurting let me know and we can give her an extra bolus," and "Let us know when it is a two or three, don't wait until pain is severe." Parents verbalized understanding. When a family member asked if the pain medicine was in the IV, the mother replied, "When she is in pain, I have to ask for it."

Nurses asked parents to choose when more than one analgesic was ordered. "I noticed yesterday we were giving Tylenol and Motrin, but last night she got the Lortab, is that what you prefer?" The mom explained, "It depends." The nurse elaborated, "The Tylenol is due at nine when her skin care to her foot is due." The mom responded, "That's when they have been giving the Lortab, with the foot care." The nurse repeated the plan, "So I am going to do foot care at nine and three, so I can bring the Lortab then and we can alternate with the Motrin." The mom agrees, "OK."

When another nurse was alerted to the pain of a nine-month old one day after cleft palate repair, the nurse asked, "You want to give Tylenol this time?" The mom disagrees, "Let's give Lortab." In the post-intervention interview the nurse supported the mother's decision, "She was really fussy, so I would have given Tylenol with Codeine too." When the same nurse was asked by a patient's father, "You think she can have some Tylenol before we leave?" The nurse clarified, "You want plain Tylenol or Tylenol with Codeine?" The mother supports her husband's request, "Yeh, Tylenol, I guess." In the post intervention interview the nurse reported she disagreed with the parents' decision, "I probably would have given Tylenol with Codeine because it may be a bumpy ride home and Tylenol alone didn't hold her for more than two hours the last time."

When mothers were unsure about intervening, they requested nurses' advice and supported nurses when the decision to intervene was made. The mom asked, "Should I wake her up and have her take it?" The nurse deferred to the mother, "It's up to you." The mother referred back to the nurse's expertise, "What would you do, in your experience should we wake her?" The nurse replied, "I would."

The unit's culture was one of responsiveness to parents' requests for analgesics and decisions regarding type of analgesic. Nurses deferred to the parents, and did not assert their professional clinical judgment when their decisions differed from the parents. When asked about their pain goals, one nurse referred to the parents, "Keep them comfortable and meet parents' goal for the little ones." When asked in post-shift interviews what helped the nurses meet their pain management goals, three nurses mentioned the "Parents," more specifically "Parents who were active in plan of care," and "Listen to parents and what they say."

Nurses were equally reliant on **grandmothers**. A nurse was told in face to face report "Grandma of four is overdramatic, he's hurting, he's wet the bed, why is he like this, he's not like this at home." On initial assessment, the nurse asked, "Are you Mom?" The grandmother replies, "Mom is in another hospital." The nurse asked, "How we doing?" The patient's grandmother responded, "He got pain med at five and has been doing better, that medicine they are giving him now does that knock him out?" The nurse explained, "It's a narcotic, which can make him sleepy, but the oral lasts longer." The grandmother affirmed, "That's what they said." Later, the grandmother reported, "I think that pain med is working much better." The nurse reminded her, "Let me know when he first starts to hurt."

One nurse was assigned a patient who was accompanied by his **Aunt** and another patient accompanied by her **Foster Mother** of four months. Whereas nurses had deferred intervention decisions to parents and grandmothers, this one nurse did not defer pain assessment and management decisions to the Aunt or Foster Mother. The first time the nurse asked the Aunt, "Do you think he needs pain medicine?" The Aunt responded, "No, he's not hurting." The two year old patient nods, however indicating he is hurting. The Aunt repeats, "No, I think he is just liking it too much – You are not hurting are you?" The patient then nods, No. Later, the Aunt apologizes, "We are back, I'm sorry," the Aunt informs the nurse as she and the patient return to the room. The nurse responds, "I know." The Aunt points out, "See he doesn't need medicine. He's been downstairs running around." The nurse politely refutes the Aunts judgment, "So do you want to give it or not, I kind a think we should." The same nurse tries to comfort a neurologically devastated patient after Nissen fundoplication. The Foster Mother explains that the child doesn't like to be covered up. She likes to hold blanket and cuddle it, but not be covered up. The nurse responds, "I was thinking this would comfort her."

The Foster Mother disagrees, "No, she will be fussy." The Foster Mother later asks when the girl last received morphine. The nurse replies, "I'm not sure. I will bring her morphine as soon as I can give it," but never brings the patient morphine. She does medicate the patient with scheduled Toradol.

These were not the only times the **nurse** was the decision maker. Ten of the nurses made decisions to intervene for alerts to patients' pains. Nurses also planned pain management interventions and pre-medicated patients for procedures and therapies.

Nurses' decisions promoted distraction and other **biobehavioral interventions.** When a mom reported a patient's analgesics were ineffective, another nurse promotes distraction, "When was she given the Vicodin at 1PM? ...'Cause it is not working, it is making her sleep, but when she is sleeping she is moaning and groaning." The nurse suggests repositioning, "Is it possible for her to sit up in a chair?" The mother reported, "She was sitting up in bed a while ago." The nurse then suggested, "what about a movie or crayons - I'm just thinking some distraction." Another nurse hears an unaccompanied infant crying. The nurse changes the diaper, bundles the patient and provides a pacifier.

Nurses decided to intervene when **pain was not controlled**, "Where is your pain level at on a 1 to 10 scale?" The patient reported, "8." The nurse decided, "Then you need something, we try to keep your pain level below a five." When another nurse was notified of another patient's lack of available analgesics, she decided to escalate the patient's pain management plan, "Is she the one they said just got something for pain?" The patient's mother responds, "Yes." The nurse replies, "I can see if I can get anything."

When the care team is **unsure if or why** a patient is in pain, the nurse determines cause and intervenes. A mother reports, "This is not like her, she's only like this when people mess with her. She's been letting them listen to her all week. This is different. Her CT is because she is so agitated and she is sweating, this is her last shirt." The nurse asks, "Is your

IV hurting you."  The nurse notes, "It is a little puffy, maybe IV is hurting foot and that's what is bothering her, let's take it out."

Nurses decided to intervene and encouraged patients to take analgesics **despite their resistance.** The patient refused analgesic, "I just don't want this medicine." The patient's mother supported the nurse's decision, "I know, I agree with the nurse, thank-you."

Nurses decided when to give interventions to **pre-medicate** patients for procedures and treatments, such as dressing changes and physical therapy. "I brought him some pain medicine too." The mom responds, "Cool." Another nurse reports, "I'm giving you two tabs today." The patient's mother asks, "Can she get the Benadryl I think the doctor ordered it." The nurse suggests waiting; "Can we wait 'cause PT is coming and I don't want you to be drowsy."

Nurses also **planned interventions.** A nurse explained her decision, "I thought I would give you your pain med, are you hurting at all?" The patient responded, "No." The nurse further probed, "On a scale of zero to ten, zero being no pain, ten the worst ever?" The patient replied, "Zero." The patient's dad asked, "You're not hurting at all?" The patient confirmed, "No." The nurse explained her decision, "Well let's give you this pain med- it's the same as what I gave you this morning so we can keep the pain controlled." The nurse intervenes 4 hours and 20 minutes later, this time for a pain score of 1. Another nurse decides to **wait to intervene,** "She is due for pain med in about 1/2 hour, maybe that will help?" The nurse provides the analgesic 31 minutes later.

Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases, 9 nurses relied on 14 **parents** to make the decisions that resulted in 25 interventions, 10 **nurses** made decisions that resulted in the remaining 17 interventions, and the remaining 6 nurses let 8 **patients** make the decision that resulted in 16 interventions.

4.3.3.2 Influencing decisions: Nurses

Nurses may have influenced patient and parents decisions by advising to avoid severe pain, communicating pain expectations, and unfortunately, breaking promises. Three different nurses and one surgeon advised patients, parents, and a grandmother to **avoid severe pain**. Three of these statements were made during the initial assessment of the patient, “Don't wait until it hurts too much," "Let us know when it is a two or three, don't wait until pain is severe,” and "Let me know when he first starts to hurt."

Seven nurses **communicated their pain expectations** regarding ten patients to patients, parents and the researcher. Four of these patients had pain that was challenging to control. To the patients and parents, the nurses communicated that complete pain relief was an unrealistic expectation, "It's gonna be sore a little," and “You will have some tenderness, soreness, but our goal is to keep you as pain-free as possible.”

Other nurses communicated concerns to patients, parents, other members of the care team and the researcher when the patients’ pains were inconsistent with the nurses’ clinical experiences. To a patient and parent, "Usually after lap chole they go home the next day.” To the researcher about the same patient, “I think she is mistaking some of her pain for gas, I think she needs to start PO pain medicine.” Then four and a half hours later, "I have never seen a lap chole with such pain as her. I think she is at a disadvantage since she can't walk. I'm not saying she is not in pain, but maybe she is mistaking one pain for another. They are genuine clock watchers, I tell you.”

A six year old’s pain after open reduction internal fixation left elbow was also challenging to control. The patient also communicated her pain expectation, "My arm really really hurts!" Her nurse responds, "That's why we gave you that medicine." The patient elaborates, "I didn't think it would hurt this much!" Less than a half hour later the patient further elaborates in response to the nurse’s question, “Is your arm fixed?" She responds, "No, I want it better and it is still not better."

Nurses communicated to mothers that pain expectations need to be individualized, "For some kids this is a very painful surgery and some kids do fine with just Tylenol." Finally nurses expressed their expectations of interventions and patient’s pain control, "I think this may be really strong for him." Another patient asks, “What am I taking?" The nurse responds, "Oxycodone." The patient questions, "Does it work?" The nurse communicates her expectations, "It should."

Nurses also influenced decisions to intervene by failing to follow through with the analgesic. Four nurses **broke their promises** to four patients. Despite, “I'll bring Tylenol with Codeine when she can have it," and “We could try Tylenol or Motrin," and "I'm not sure I will bring her morphine as soon as I can give it,” these analgesics were never delivered to these three patients.

4.3.3.3 Previous pain and pain intervention experiences

Patients’ previous pain experiences may have influenced decisions to intervene. The previous pain experiences of 16 patients were shared with the 9 nurses caring for these patients. Previous pain experiences focused on the pain and pain relief of previous surgeries, as well as the pain relief or lack of pain relief with previous analgesics and analgesic doses.

The mother of a seven year old female patient who had a laparoscopic interval appendectomy explained her daughter’s past experience with the pain of her ruptured appendix and the analgesics to manage that pain. The mother comments, "She's been doing really well with the Codeine or whatever." The nurse decides, "She has Toradol due now, but I think we should give the oral pain medicine also…I really want something in your stomach" The patient’s mom adds, "or you will throw up, you don't keep medicine down well, not even vitamins." When the nurse returns with cereal, milk, Toradol, and hydrocodone, she verifies the patient was here before with a ruptured appendix. The mom shares their previous experience, "Yah, it's nice to see, because with previous hospitalization she was out for all 10 days and last time she got Codeine and she would sleep and get grumpy but this time she got the other med and…" The patient interrupts, "I walked to the cafeteria." The patient’s mom continues, "We were resistant for her to take it, but it works much better, I was glad we did." The nurse explains, "This is hydrocodone, which is different than the Codeine she got last time.”

Patients shared past experiences with pain. A 16 year old patient shares his worst pain experiences with the nurse observed, “One time it pulled out (PICC) and they had to push it back in. Imagine someone putting five pounds of pressure on one spot on your neck. Now that's pain." Another patient shared her lack of pain experience. The patient reported, "My fingers feel weird." Her nurse questions, "Is it different since surgery?" The patient responds, "Same, but this is the first time I've broken my arm."

Patient’s previous experience with analgesics influenced future analgesic decisions. When a nurse returns with an analgesic, the patient asks, "What's that?" The nurse answers, “That's your Dilaudid." The patient comments, "It's a lot." His nurse explains, "Well I diluted it so it looks like a lot, but they did go up on the dose." The patient responds, "Good it works better when I get more.” After receiving the Dilaudid, the nurse asks, “You getting some pain relief?" The patient shares more about his past pain experiences, "Yes and I get really bad pain sometimes my pain gets so bad I pass out and that's not what you want."

Previous experiences provided information regarding amount of analgesic required to relieve the patients’ pains and how often the analgesics are needed. As part of her initial assessment the nurse asks the mother of a nine month old one day after cochlear implant, "Has she been fussy?” Her mother’s response reflects the need to adjust the interval between analgesics doses, "Just right before her pain med wears off."

The father of another patient reports the analgesic is working, but wearing off between doses, "He was doing OK with Lortab and that seems to have worn off and then with moving him this is the first he's been holding his head.” The father also shares the patient’s previous experience with the taste of the medication, "He won't like it, so if you have ideas, or we can just give it to him." While the nurse and the father force the patient to take the Lortab, "Come on buddy, this is the only one that makes the pain go away."

4.3.3.4 Negotiating

Nurses negotiated analgesic schedules, type of analgesic, transition to other methods of managing pain, analgesic side effects, discrepancies with expectations, and patients' transition to different levels of care to make intervention decisions for patients. Just over half (25) of the 46 post-operative patients had more than one analgesic ordered during the observation. Nurses tried to transition patients to oral analgesics to prepare for discharge home (18 post-operative patients). Analgesic side effects and the potential for analgesic side effects influenced the decisions of 9 nurses care of 22 patients. Patient's pain management plans changed as they transferred to the post-surgical nursing unit from the post-anesthesia care unit (n=7), emergency department (n=2), pediatric intensive care unit (n=2), and directly from physicians' offices (n=3). All of these were post-operative patients, except the two coming from the emergency department and one transferred directly from their physician's office.

Eleven of the post-operative patients had scheduled and PRN analgesics ordered. Toradol was the scheduled analgesic for nine of these patients. The other two patients had both scheduled ibuprofen and acetaminophen. Six post-operative patients had both acetaminophen and another combination acetaminophen analgesic ordered PRN.  For four of these patients, acetaminophen with Codeine was the combination product; and the remaining two had orders for a hydrocodone and acetaminophen combination analgesic. Seven post-surgical patients had IV morphine and another oral opioid analgesic ordered PRN pain. Two of these patients had Tylenol with Codeine ordered PRN in addition to Morphine; and four of these patients had a hydrocodone & acetaminophen analgesic combination ordered PRN in addition to Morphine. One patient had an oral hydrocodone & acetaminophen analgesic combination ordered PRN and later an oral oxycodone ordered PRN in addition to PRN IV Dilaudid.

Nurses had to negotiate analgesic schedule, opioid frequency, route of analgesics, analgesic side effects, and acetaminophen limit when deciding between multiple analgesic orders. Nurses' decisions were complicated by analgesics timing. On six occasions, five nurses were unable to intervene with an analgesic for five patients, because the next dose of analgesic was not yet due. Some nurses were more stringent about the dosing schedule, “I don't think she can have her Lortab until 9:45 (9:05 now) but let me check. Perhaps because the patients appeared comfortable, "She's sleeping now." One nurse consulted the physician assistant to clarify orders and escalate the patient’s pain management plan.

Nurses inform parents of the **analgesic schedules,** “Let me see if it is time for you to have some medicine…She can have pain meds, she has Tylenol and Tylenol with codeine. So here is the deal, if we give Tylenol and it doesn't help we need to wait four hours to give Tylenol with Codeine, it's up to you." The same nurse explains to another parent two hours after giving Tylenol to a patient, "We can give it to her every four hours."

At change of shift report, a nurse is informed that her patient has just received Vicodin for pain. When the nurse initially assesses the patient 32 minute later, the patient reports her throat is painful. The nurse clarifies, "Any better since med they gave you?" The patient replies, "Not, really." The nurse asks the patient to rate her pain, "Can you give me a number between 1 to 10.” The patients rated her pain, "7." The nurse further probes, "And before pain medicine?" The patient reports, "10." The nurse agrees to pursue additional interventions, "So down a little bit. I’ll check if I can get something else." The nurse checks the electronic medication administration record to negotiate the patient’s analgesic schedule. She reads, "Morphine if not tolerating diet, Toradol not due until 10 and Vicodin given at 6:50." She approaches the physician assistant, “Room 11 states she's really hurting and her morphine is only if tolerating diet.” The physician assistant agrees, "Sure whatever, but this is the last dose." The nurse administers morphine IV 13 minutes later and informs the patient and her mother, "I have your morphine, but this is the last dose because we want to send you home today.”

While 11 post-operative patients had scheduled and PRN analgesics ordered, only one nurse gave them at the same time. "She has Toradol due now, but I think we should give the oral pain medicine also.” Throughout the study, the researcher observed the administration of nine doses of scheduled Toradol and two doses of scheduled Motrin by seven nurses to eight different patents. Most nurses waited and reassessed after giving scheduled analgesics to see if PRN analgesics were needed, “OK you know you need to tell me if you need something for pain.  I gave you Toradol earlier.” Instead nurses tried to alternate the scheduled pain medications with the PRN analgesics, "So I am going to do foot care at 9 and 3 so I can bring the Lortab then and we can alternate with the Motrin."  Nurses also used advanced planning to schedule the administration of even PRN analgesics.

As previously mentioned, a nurse is challenged to negotiate **opioid frequency** to manage a 15 year old female’s pain one day after laparoscopic cholecystectomy. Less than an hour after receiving Vicodin, the nurse is informed on reassessment that the patient is still in pain. The nurse expresses her concern regarding the administration of additional ordered analgesics, “I would not feel comfortable giving a dose of morphine right now, I can give it to you in 30-45 minutes- closer to 3.  I want to get you what you need but I can't give the narcotics too close together."

Two parents and a resident surgeon expressed a desire to limit the use of opioids for post-surgical patients, but nurses never voiced similar concerns. In response to the discharge instructions provided to a the mother of a seven year old girl one day after laparoscopic interval appendectomy, the mother commented, “So I can keep giving the Motrin, ‘cause this is the one (Lortab) I would want to get her off of." The nurse clarified, "The best thing is to alternate them, since this one is only every four hours, so she can have it again at noon."

If more than one opioid was ordered, one was usually ordered by the IV route and the other the oral route. Seven post-surgical patients had IV morphine and another oral opioid analgesic ordered PRN pain. Two of these patients had Tylenol with Codeine ordered PRN in addition to Morphine; and four of these patients had a hydrocodone & acetaminophen analgesic combination ordered PRN in addition to Morphine. One patient had an oral hydrocodone & acetaminophen analgesic combination ordered PRN and later an oral oxycodone ordered PRN in addition to PRN IV Dilaudid. Nurses did not express concern about getting patient's off opioids, but they did try to move patients from the IV to the oral route.

Nurses negotiate the transition from **IV to oral analgesics,** "If you are able to eat something and keep it down, then we will go to the oral pain med, since that will be what you will go home on." The 15 year old leaves eight hours later one day after her laparoscopic appendectomy. Ten hours later, the same nurse admits a 19 month old female patient after cochlear implant with orders for Morphine 0.5-1mg IV every 2-4 hrs PRN and Tylenol with Codeine 1/2 tsp (12/125/5ml) every 4-6 hours PRN pain. The nurse explains through a Spanish translator, "She has some pain medicine we can give orally or by IV. If she is eating and drinking OK we will give her the oral pain medicine since that is what she will go home on."

Nurses also negotiated transition to other methods of managing pain, specifically the transition off of pain technologies. During study observations nurses cared for four patients with epidural analgesia and four patients with patient controlled analgesia (PCA). Patients were not transitioned off the PCA during the shift observations, but two patients cared for by the same nurse were transitioned off their epidural analgesia. The transition of a 15 year old male three post-operative days since pectus carnitum repair went smoothly. The other patient's transition from epidural analgesia was more complicated (see section 4.4).

Dose, frequency and daily maximum of acetaminophen were issues that presented to 11 of the 14 nurses observed. A nurse negotiates the **acetaminophen limit** to manage the pain of a 2 week old infant who has Tylenol and Tylenol with Codeine ordered PRN pain three days after thoracotomy. When the nurse goes to pull the Tylenol with Codeine, she identifies that the patient got plain Tylenol just two hours earlier. The co-signing nurse agrees, "She can't have anything then." The nurse explains the dilemma to the mother, who responds, "That's what I thought." The nurse documents a FLACC of 3, a non-pharmacologic interventions of held, and a note "too soon for next pain med, encouraged feeding."

Another patient's schedule of two analgesics, both with acetaminophen challenges the patient's pain management and the nurse's ability to intervene for his uncontrolled pain. The nurse being observed asks for clarification from the transferring nurse, "So when was the last time for Lortab?" The nurse reports again, "11:50", his Tylenol was due at 2, but I didn't give it because he can't get Tylenol with the Lortab, but he can probably get it again before bedtime."

The most complicated analgesic decision for a nurse to negotiate was seen ordered for a patient three days after open cranial vault reconstruction. This one year old female had ordered for pain Motrin 80 mg every 6 hours, Tylenol every 6 hours, Morphine 0.5mg IV every 2 hours PRN, and Lortab PRN. In consult with the mother, the nurse negotiated a plan to give Lortab at nine and three with foot wound care and alternate those doses with the Motrin. She charted the omission of the scheduled Tylenol.

The acetaminophen limit was so concerning to a physician assistant that he called back to the nursing unit to alter a previously written order. He asks the nurse to write clarification for Lortab dose every six hours instead of the every four hours he originally wrote. This would drop the patient's daily acetaminophen maximum from three grams to two grams. This particular patient was adult size weighing 89.4 kilograms (kg). She had no co-morbidities which would require reducing her daily acetaminophen limit.

Nine nurses discharged thirteen patients on analgesics containing acetaminophen. Printed skin incision instructions contain directions regarding limiting the use of Tylenol when patients are prescribed acetaminophen containing analgesics. Two of the nurses provided these written instructions. Both of these nurses and an additional five nurses mentioned limiting Tylenol use, "Tylenol with Codeine one milliliter every four hours PRN pain, you can give plain Tylenol, just make sure you give one or the other not both." A second nurse explains how the limit applies to another patients discharge prescription, "Prescription for Tylenol with Codeine may have every six hours for pain. If you give it, don't give Tylenol within four hours." The timing was not as clear in the instructions given by this nurse, "Can I see the prescription they gave you? OK this is Lortab - you just can't give Tylenol when taking the Lortab. Well, you can give Tylenol but Lortab has Tylenol in it and you want to limit the doses to - I think it is four or six because there is a limit. Did they talk to you about that? She can also have Motrin." Another nurse mentions the daily limit, "This shows the last Vicodin was at 7:45, so he can have it any time. While he's taking this he can't take Tylenol, the limit is 4000 mg per day." Another mother verbalizing understanding, "The person who dropped off scripts said if he doesn't need the Lortab, he can take Tylenol, but not both."

Some patients were discharged without instructions to limit acetaminophen, "Lortab for pain one to two tabs. She may take regular Tylenol or Motrin if she doesn't need strong pain med because she didn't use any today." Three nurses merely recommend Motrin, "I wrote down she got Lortab at 10:45 so she can't get more until 2:15, but you can give her Motrin in the mean time if she needs anything. Any questions?"

Analgesic side effects and the potential for **analgesic side effects** influenced the decisions of 9 nurses care of 22 patients. Five of the nurses whose decisions were influenced by analgesic side effects and the potential for side effects took care of at least two patients for whom this was a concern, one nurse cared for three and two nurses caring for four such patients. Analgesic side effects included: nausea, sedation, dysphoria, hypnogotic myoclonus, orthostatic hypotension, fall, pruritis, respiratory depression, and constipation. Nurses addressed up to five analgesic side effects per patient. All but one of the nurses with greater than three years of experience considered analgesic side effects in making intervention decisions. Yet, only two of the nurses with less than three years of experience considered analgesic side effects in making intervention decisions or had patient's who experienced any analgesics side effects. This finding suggests that nurses' years of experience influence their analgesic side effect management.

The most common side effect all 9 of these nurses negotiated was **nausea** and the potential for nausea for 17 of these patients. The medication administration record had a note "take with food to avoid GI upset" for all ordered oral opioid containing analgesic. Six of the seven nurses with over three years of experience required patients to eat prior to administering an oral opioid containing analgesic. "Before he can have pain med he has to have something in his tummy - will he drink milk?" Another nurse states, "We just want him to eat something 'cause the pain med can be a little irritating on the stomach."

Only one nurse with less than 3 years of experience required her patient to eat before taking an opioid containing oral analgesic. She checked if the patient had something to eat before giving Lortab to the mother of a patient who had a cleft palate repair the previous day. "You probably know this, but don't give (Lortab) on empty stomach or it can make her sick."

Experienced nurses even delayed analgesic administration until patients had eaten. "I am going to make sure she eats and wait five to ten minutes, but I'll get this Toradol started."

Only four patients actually reported nausea during the shift observed. A nurse reassesses a patient 28 minutes after giving the patient hydrocodone,, "How does your tummy feel now?" The dad reports, "Not very good." The patient cries, "Ow." Her mother asks, "What's wrong, you can go ahead and throw up." The patient responds, "That was a bad medicine you gave me." No patients vomited during observations.

A foster mother asks if her daughter has received anything for nausea, because she is sleepy. **Sleep and sedation** was the next most common analgesic side effect five nurses and care team members addressed for five patients. At 8:06, a care partner reported that a mother asked to delay gathering vital signs to let the patient sleep. The patient had received an analgesic at 6:45. A child life specialist informs a parent, "That medicine may make him sleepy." For at least one patient, sedation from the analgesic was the goal. The mother explains the reason for her question, "The PNP said to keep his head at the level of his butt and as you saw he wanted to get up." At 7:11 PM, a patient points out, "I've been asleep for most of the day. I had just woken up and sat up to eat and thought I would pass out." There were no interventions provided to reverse patients' sleepiness or sedation.

Other patients reported **dysphoria,** “I feel funny." The patient’s nurse asks, "What kind of funny?" He replies, "Like the Dilaudid's working. What are you doing?" The nurse answers, "I'm just flushing it with one milliliter saline." The patient instructs, "Flush it so I get all of it. I plan on falling back to sleep.” Later that night with another dose the patient reports, "Yes, it's working I can feel it. It makes me feel loopy." A child life specialist asks another patient, "Does that med make your head feel kind of funny?"

Patient and parent reports suggest that a patient may have experienced another opioid-related central nervous system side effect, **hypnogotic myoclonus**. The patient’s mother reports, “I told her to go to sleep but she couldn't, with that morphine she always startles awake, I don't know what's up with that?" The patient describes the experience, "I just got through dosing off and my heart felt like it was scared…I don't know if it is one of these or Morphine.” This report influences the nurses decision, “That could be, lets do a trial off the Morphine.”

Another patient reported after receiving Nubain for pruritis, “I am a little light-headed" The nurse delegated for the care partner to get sitting and standing **blood pressures**. She further instructed that if the blood pressure decreased when the patient stood up, the care partner should have him sit down. The blood pressures were the same sitting and standing. Another parent warns her son of the risk of **falling** when he reports he is going to walk around the unit later in the evening, “Just make sure (family friend) near you especially if you’ve had pain med.” No patients fell during the observations.

Other patients complained of **pruritis**, "Do you happen to know why my skin is so itchy?" The nurse explains, “It could be the morphine." She explains you can get a histamine release from opioids like morphine or Codeine. The patient asks, “I wondered if I'm allergic to sheets?" The nurse disagrees, "I bet it is the morphine, I can't for sure tell you it is not the sheets but especially when patients have a (PCA) button they get itchy from the morphine. I'll be back in a while with the Toradol and then next time you need something for pain, I'll give you the oral pain med." This patient did not have a PCA button. A grandmother reports, “He usually wakes up crying, he has been itching all over." His nurse asks, " Does he have any allergies? " His grandmother replies, "No, but we have a strong family history of allergies, could it be his antibiotic?" The nurse suspects the analgesic, "He isn't getting an antibiotic, has he had his pain med before?" The grandmother questions, "You think it's the pain med?" The nurse plans, "I'll ask PNP if we should try alternating Tylenol and Motrin or give Benadryl before his Lortab."

There were two observations where nurses negotiated concerns of **respiratory depression.** One patient asked, "How's my breathing." The nurse responded, "Good, you are 100%." Ten minutes later when the nurse assesses the patient for pain relief after Dilaudid administration, he explains his earlier question, "It makes my lungs slow down." Another nurse came to the nurse being observed for consultation regarding a patient who complained of chest tightness after receiving three mg of morphine. The nurse recommended checking the patient; and if the patient was fine she suggested consoling the family that it may be gas. As previously mentioned, another nurse being observed was resistant to give morphine less than an hour after giving a dose of Vicodin. This may have been due to concerns of respiratory depression, especially considering that the mother reported that the patient was sleeping, but moaning and groaning in her sleep. The attending surgeon may have also had this concern. The nurse and the surgeon review the orders and the surgeon restates, "She's on Vicodin, morphine and Toradol…It's just not right, it is too unpredictable, Morphine should be given every two hours, not three to four and Vicodin five mg?" There were no instances of respiratory depression observed during the study.

**Constipation** was another potential opioid related side effect care team members discussed. A nurse explains to the mother of a patient before discharge, "The Lortab can also cause constipation so you want to add juices – 'cause we don't want her to get constipated." A physician's assistant asks, "Are Fleet enemas done here? …They say she does that at home and with all the pain meds we are pumping into her, that may be it. It may explain pain or it could be from cautery or gall bladder perfed a little on removal."

Six of the nurses received information in report regarding patients and family members' pain management expectations as well as inconsistencies with nurses' expectations of patients' pain behaviors and concerning pain behaviors. Nurses negotiated these **discrepancies with expectations** to make intervention decisions for patients.

The night nurse from the previous shift approaches the nurse observed concerned to learn how the nurse negotiated decisions to administer analgesics, "Did you have to give a lot of pain med." The nurse replied, "three morphine, two Toradol and Vicodin, and she wanted me to push it at hand." The night nurse confirmed," She wanted me to do that, but I gave it at the next one higher by the pump." This request had not be relayed during the previous shift report, but was obviously a concerning patient request. The nurse observed had negotiated this request by responding in a fashion similar to the previous nurse. "I am going to give it here" (same place as previous nurse)." During this report, the nurses were able to confirm their consistency in analgesic administration decisions.

Nurses negotiated patients' **transition to different levels of care** to make intervention decisions for patients. Post-operative patients' pain management plans changed as they transferred to the post-surgical nursing unit from the post-anesthesia care unit (7), pediatric intensive care unit (2), and directly from physicians' offices (1). Four of these transitions were particularly challenging.

The challenge in transitioning infants from the post-anesthesia care unit to the nursing unit was determining whether to intervene for pain or hunger. Nurses chose to intervene for hunger first. The first nurse asks, "How long does she (breast) feed? Try one side if doesn't take we'll give pedialyte. She has Tylenol or Tylenol with codeine for pain, she didn't have anything downstairs so we may give her a dose later." She gives Tylenol with Codeine 38 minutes later; and explains her analgesic preference, "I usually give the strongest right after surgery especially if they didn't get anything downstairs (in PACU). That way if I had given the Tylenol and it didn't work I would have to wait four hours. Or if they had morphine, I would give that until they were eating and drinking.  If it were my kid, I would keep them on the Tylenol with Codeine for 24 hours, unless they were going 6 hours without needing it, then I would go to the Tylenol. Now on this one she has Tylenol and Tylenol with codeine and she is only hurting a little so I would offer the choice to parents.”

Another challenge was a transfer directly from the physicians’ office. When admitted at 10:51, the patient’s mother reports, “Yeh, she had her Lortab this morning (at) 07:45." She also reports she has been receiving this analgesic, “At night every 4 hours." At 11:17, the patient’s mother comments, "She's happy - until the pain med wears off." The nurse notes, "And she doesn't have anything ordered."  At 17:18, the mother voices her concerns, "She is really hurting and she is feeling warm, do you think she has a fever?" The nurse informs the patient’s mother, "They didn't want to give anything this close to surgery."  The nurse reassures the mother that the patient does not have a fever; and later shares the mother’s concerns with the surgeon.

4.3.3.5 Consultation

To assist in making pain management decisions, nurses consulted other nurses and healthcare providers.  There were also observations when patients’ pains were not well controlled, yet, nurses chose not to advocate and escalate the child’s pain management decisions to a charge nurse or prescriber.

Eight nurses consulted or were consulted by other nurses and healthcare providers to make pain management decisions during observations. Three of these nurses had less than three years of nursing experience and the other five had four to fifteen years of experience. Nurse’s usually first consulted a nurse with more experience, their charge nurse or clinical manager.

Consultations from other nurses were related to analgesic administration and side effect management. While observing a nurse with five years of nursing experience and three years of experience on the postsurgical unit, a second nurse came to the nurse being observed in the medication room for consultation regarding diluting morphine prior to administration. The experienced nurse explained, "It's up to you, it is up to the individual nurse."

A nurse with two years of nursing experience was told in report that her 11 year old patient received Lortab at 20:00 and Benadryl at 4:45. She had lots of pruritis and an allergy to codeine. The night shift had consulted pharmacy, who stated this pruritis had no relation to her codeine allergy, but could be adverse reaction to hydrocodone. The family was concerned it might be bed bugs. When the family again brought up the concern of a potential allergy to hydrocodone, the observed nurse consulted a second nurse as to whether you were allergic to hydrocodone if you had a codeine allergy. The second nurse stated she didn't know and advised to check with the pharmacist. Instead the nurse discussed the patient with the resident physician who was rounding at that time. He noted there was not a lot to send her home on, and he didn't want to send her home on Darvocet. The patient did not report pruritis with the next dose administration.

A nurse with two years of experience asked her clinical manager to co-sign the valium she wanted to give for muscle spasms to her newly admitted patient from the post-anesthesia care unit after bilateral Achilles and hamstring lengthening. The clinical manager clarifies that the valium is on hold because the patient is on the pain service. The nurse must call anesthesia before giving the dose. The nurses discuss lack of anesthesia recognition of need to treat spasms with valium. Neither the nurse nor the clinical manager contacts the pain management service to escalate the child's pain management decisions to the prescriber or to advocate for interventions to control the patient's pain and muscle spasms.

A nurse being observed who has six years of nursing experience and one year on the pediatric post-surgical unit seeks out her charge nurse for consultation. She reports, "Mom is ready to go home, but the patient (is) not ready, She's crying." The charge nurse offers, "Well, if she needs to wait and get another round of pain med, that's ok." The nurse clarifies, "Did you talk to pain, did they see her?" The charge nurse responds, "I spoke to pain nurse and she thought she had already gone home.  She got an epidural for a scope!" The observed nurse comments, "She is on ten mg of Norco that would knock me out." The nurse discharges the patient at 10:54 providing a dose of Motrin as she is leaving. The mother asks the patient, "Do you want to take that puke bowl with us?" The nurse suggests, "Do you want one of those bags?" The mother agrees, "Yeh, that's a good idea." The nurse wishes the patient well, "You take care, ok - hope you feel better."  The pain management team is not notified of the patients continued pain or nausea prior to discharge. The nurse sees the pain management nurse just over an hour later and still never discusses the challenges controlling this patient's pain and nausea.

Two nurses consulted two different physician assistants regarding their patients' pains. One nurse had 15 years of experience and the other had 3. The more experienced nurse consulted both the physician assistant and the surgeon when they were making separate patient rounds. The nurse asks the physician's assistant in the morning if he is going to add an oral analgesic and reviews currently ordered analgesics as morphine and Toradol. In the afternoon, the nurse notes that the physician assistant ordered Lortab 5/500. The nurse pages the physician assistant and requests an increased dose to 7.5mg. She assures the physician assistant that she has not yet given 5/500, but "she (the patient) has been on pain meds before, they are going to laugh."  Almost four hours later, the nurse discusses the patient's continued pain with the physician's assistant when he returns for afternoon patient rounds. The nurse asks, "Have you spoke to (surgeon)." The physician assistant replies, "I'm going to text him." Twenty minutes before the end of the nurses shift, she discusses the patient's continued pain with the surgeon when he makes patient rounds. The surgeon expresses concern about every analgesic order, telling the nurse, "I asked to up her morphine." Upon leaving the nursing unit, he informed the nurse, ""I upped the Morphine and if still having pain they can add back Toradol."

Unfortunately, nurses did not always generate consults for their patients poorly controlled pain. An eight year old female who was one day post-operatively from open reduction and internal fixation of left elbow had severe pain complicated by nausea. The nurse was in the patient room when the patient was seen by the resident surgeon and at the nurses' station later during the shift when the attending surgeon discounted the resident's opinion. According to the patient's mother, "he offered for her to stay the night and that's what we think we want to do." The analgesic and anti-nausea medications ordered, however, were not adjusted.

4.3.3.6 Decision summary

The decision to intervene was either the patients, parents, or nurses. Nurses influenced these decisions by advising to avoid severe pain, communicating pain expectations, and breaking promises, Parents and patients influenced these decisions by sharing previous pain and pain intervention experiences. Nurses negotiated analgesic schedules, type of analgesic, analgesic side effects, transition to other methods of managing pain, discrepancies with expectations, and patients' transition to a different level of care. To assist in making pain management decisions, nurses consulted other nurses and healthcare providers.

Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases, 9 nurses relied on 14 **parents** to make the decisions that resulted in 25 interventions, 10 **nurses** made decisions that resulted in the remaining 17 interventions, and 6 nurses let 8 **patients** make the decision that resulted in 16 interventions. The youngest **patient** asked to decide was a six years old female. Six of the patient decisions were requests for analgesics or biobehavioral interventions by 9 and 16 year old males and a 15 year old female, all of whom have had previous hospitalizations and previous surgeries.

It was far more common for nurses to let **parents** decide whether or not to intervene for patients' pains. Nurses coached parents to ask for analgesic interventions; and nurses asked parents to choose when more than one analgesic was ordered. When mothers were unsure about intervening, they requested nurses' advice and supported nurses when the decision to intervene was made.

The unit's culture was one of responsiveness to parents' requests for analgesics and decisions regarding type of analgesic. Nurses deferred to the parents, and did not assert their professional clinical judgment when their decisions differed from the parents. When asked in post-shift interviews what helped the nurses meet their pain management goals, three nurses mentioned the "Parents." One nurse summed up the culture of family centered care, "Just do whatever parents want, that's what we do here, isn't it? They are really nice."

Nurses were equally reliant on **grandmothers.** One nurse was assigned a patient who was accompanied by his **Aunt** and another patient accompanied by her **Foster Mother** of four months. Whereas nurses had deferred intervention decisions to parents and grandmothers, this one nurse did not defer pain assessment and management decisions to the Aunt or Foster Mother.

**Nurses** decided to intervene when **pain was not controlled**. When the care team is **unsure if or why** a patient is in pain, the nurse determines the cause and intervenes. Ten of the nurses made decisions to intervene when alerted to patients' pains. Nurses also **planned** pain management interventions and pre-medicated patients for procedures and therapies. Nurses decided when to give interventions to **pre-medicate** patients for procedures and treatments, such as dressing changes and physical therapy. Nurses decided to intervene and encouraged patients to take analgesics **despite their resistance.** Nurses' decisions promoted distraction and other **biobehavioral interventions.**

Nurses may have influenced patient and parents decisions by advising to avoid severe pain, communicating pain expectations, and unfortunately, breaking promises. Three different nurses and one surgeon advised patients, parents, and a grandmother to **avoid severe pain**. Seven nurses **communicated their pain expectations** regarding ten patients to patients, parents and the researcher. Four of these patients had pain that was challenging to control.

These patients' pains were inconsistent with the nurses' clinical experiences. To the patients and parents, the nurses communicated that complete pain relief was an unrealistic expectation. Although, nurses communicated to two mothers that pain expectations need to be individualized. Four nurses **broke their promises** to intervene for four patients' pains.

Patients' **previous pain experiences** may have influenced decisions to intervene. The previous pain experiences of 16 patients were shared with the 9 nurses caring for these patients. Previous pain experiences focused on the pain and pain relief of previous surgeries, as well as the pain relief or lack of pain relief with previous analgesics and analgesic doses. Nurses shared past experiences with patients and patients shared past experiences with pain. Patient's previous experience with analgesics influenced future analgesic decisions. Previous experiences provided information regarding amount of analgesic required to relieve the patients' pains and how often the analgesics are needed.

Nurses **negotiated** analgesic schedules, type of analgesic, transition to other methods of managing pain, analgesic side effects, discrepancies with expectations, and patients' transition to different levels of care to make intervention decisions for patients. Just over half (25) of the 46 post-operative patients had more than one analgesic ordered during the observation. Nurses tried to transition patients to oral analgesics to prepare for discharge home. Analgesic side effects and the potential for analgesic side effects influenced nurses' decisions. Patient's pain management plans changed as they transferred to the post-surgical nursing unit from the post-anesthesia care unit, emergency department, pediatric intensive care unit, and directly from physicians' offices.

Nurses had to negotiate analgesic schedule, opioid frequency, route of analgesics, analgesic side effects, and acetaminophen limit when deciding between **multiple analgesic orders**. While 11 post-operative patients had scheduled and PRN analgesics ordered, only one nurse gave them at the same time. Most nurses waited and reassessed after giving scheduled analgesics to see if PRN analgesics were needed; or nurses tried to alternate the scheduled pain medications with PRN analgesics. If more than one opioid was ordered, one was usually ordered by the IV route and the other the oral route. Although nurses did not express concern about getting patient's off opioids, they did try to move patients from the **IV to the oral route**. Nurses used advanced planning to schedule the administration of even PRN analgesics. Nurses inform parents of the **analgesic schedules.**

Nurses' decisions were complicated by analgesics **timing**. On six occasions, five nurses were unable to intervene with an analgesic for five patients, because the next dose of analgesic was not yet due. Some nurses were more stringent about the dosing schedule, perhaps because the patients appeared comfortable. Nurses also negotiated transition to other methods of managing pain, specifically the transition off of pain technologies.

Dose, frequency and daily maximum of **acetaminophen** were issues that presented to 11 of the 14 nurses observed. Printed skin incision instructions contain discharge directions regarding limiting the use of Tylenol when patients are prescribed acetaminophen containing analgesics. Some patients were discharged without instructions to limit acetaminophen.

Analgesic side effects and the potential for **analgesic side effects** influenced the decisions of 9 nurses care of 22 patients. Analgesic side effects included: nausea, sedation, dysphoria, hypnogotic myoclonus, orthostatic hypotension, fall, pruritis, respiratory depression, and constipation. Nurses addressed up to five analgesic side effects per patient. All but one of the nurses with greater than three years of experience considered analgesic side effects in making intervention decisions. Yet, only two of the nurses with less than three years of experience considered analgesic side effects in making intervention decisions or had patient's who experienced any analgesics side effects. This finding suggests that nurses' years of experience influence their analgesic side effect management.

The most common side effect all 9 of these nurses negotiated was **nausea** and the potential for nausea for 17 of these patients. The medication administration record had a note "take with food to avoid GI upset" for all ordered oral opioid containing analgesic. Six of the seven nurses with over three years of experience required patients to eat prior to administering an oral opioid containing analgesic. Experienced nurses even delayed analgesic administration until patients had eaten. Only four patients actually reported nausea during the shifts observed. No patients vomited during observations.

**Sleep and sedation** was the next most common analgesic side effect five nurses and care team members addressed for five patients. There were no interventions provided to reverse patients' sleepiness or sedation. Patients reported **dysphoria,** described as feeling funny, loopy, and getting grumpy. Patient and parent reports suggest that one patient may have experienced another opioid-related central nervous system side effect, **hypnogotic myoclonus**. One patient reported becoming "light headed." His nurse explained that pain meds can make you at risk for **falls**. Another parent warns her son of the risk of falling after taking pain medications. No patients fell during the observations. Patients complained of **pruritis**, Nurses' differentiation of pruritis and allergies remains unclear. There were two observations where nurses negotiated concerns of **respiratory depression.** There were no instances of respiratory depression observed during the study. **Constipation** was another potential opioid related side effect care team members discussed.

Six of the nurses received information in report regarding patients and family members' pain management expectations as well as inconsistencies with nurses' expectations of patients' pain behaviors and concerning pain behaviors. Nurses were able to confirm their consistency in analgesic administration decisions between shifts. Nurses negotiated **discrepancies with expectations** to make intervention decisions for patients. In post intervention interviews, at least one nurse reports she disagreed with the parents' decisions, but provided the analgesic requested by the parents as she had been instructed in report. In report from the pediatric intensive care unit, a nurse learns that the transferring nurse thinks anxiety may be contributing to a patient's pain perception. The nurse chooses to verify contributing factors for the patient's pain with his parents. Nurses also tried to educate parents and patients when there was a discrepancy between the patient's report of pain and the nurses' expectations. Nurses tried to explain why this pain might feel differently than the pain of previous surgeries. Nurses also share the inconsistency of the patient's reports of pain and their expectations based on previous clinical experience. Other reasons for pain of unexpected severity are also considered, such as constipation, surgical procedure complications, or low pain tolerance. Low pain tolerance is only mentioned in regards to one patient during the entire 14 shifts of observation.

Nurses negotiated patients' **transition to different levels of care** to make intervention decisions for patients. Post-operative patients' pain management plans changed as they transferred to the post-surgical nursing unit from the post-anesthesia care unit (7), pediatric intensive care unit (2), and directly from physicians' offices (1). Four of these transitions were particularly challenging. The challenge in transitioning two infants from the post-anesthesia care unit to the nursing unit was determining whether to intervene for pain or hunger. Both nurses chose to intervene for hunger first.

To assist in making pain management decisions, nurses **consulted** other nurses and healthcare providers. There were also observations when patients' pains were not well controlled, yet, nurses chose not to advocate and escalate the child's pain management decisions to a charge nurse or prescriber. Eight nurses consulted or were consulted by other nurses and healthcare providers to make pain management decisions during observations. Three of these nurses had less than three years of nursing experience and the other five had four to fifteen years of experience. Nurse's usually first consulted a nurse with more experience, their charge nurse or clinical manager. Consultations from other nurses were limited to analgesic administration and side effect management. Nurses rarely escalate pain management decisions to the prescriber or pain management team. Consultation with physician assistants, surgeons, and the pain management team usually wait until these prescribers are on the nursing unit making patient rounds. Two nurses did not generate consults for their patients poorly controlled pain.

*4.3.4 Interventions*

Of the 46 post-surgical patients all but 7 had analgesics ordered. Infants who had ventricular-peritoneal shunts externalized two, three and four days prior to observation, did not have analgesics ordered. The other four patients' surgeries were 5 to 12 days prior to the observation. Of the 19 medical patients, the majority, including a patient with pancreatitis, did not have analgesics ordered, 1 patient each had acetaminophen and ibuprofen ordered, 2 patients had PCAs ordered, 1 patient hospitalized with Crohn's had an order for Percocet, 3 of the 4 non-operative trauma patients had analgesics ordered PRN,.

Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention **cases**, pediatric Registered Nurses intervened with analgesics 43 times and biobehavioral interventions 15 times. Of the 12 patients who received PRN analgesics and were discharged during the observed shift, only 2 received more than one dose of an analgesic. There were only three patients who were admitted and received PRN analgesics, and only one of these received more than one dose of an analgesic.

4.3.4.1 PRN Analgesics

**Hydrocodone** was given to 18 patients, which made it the most common PRN analgesic given. Most patients received one dose (n=13), 2 patients received two doses, and 3 patients received three doses of hydrocodone during a nurses shift. Weights of 3 patients who received hydrocodone were not available to the researcher. Dosages ranged from 5 to 10 mg for the 7 patients over 50 kg. This is consistent with the American Pain Society's recommendations (American Pain Society, 2009). Dosage ranges were 0.07 to 0.19 mg/kg for the 8 patients who weighed less than 50 kg. While pre-printed medication order forms recommend a dose of 0.15 mg/kg, the American Pain Society recommends a starting dose of 0.1 to 0.2 mg/kg. All but two patients weighing less than 50 kg were within this dosage range. Since the hydrocodone products used also contain acetaminophen, the acetaminophen dosages ranged from 325 to 500 mg for patients over 50 kg and 4.8 to 12.9 mg/kg for patients less than 50 kg. The recommended dose of acetaminophen for analgesia is 500 to 1000 mg for up to 4 grams per day for patients weighing over 50 kg; and 10 to 15 mg/kg for up to 90 mg/kg/day for patients weighing less than 50 kg. Only two patients who weighed less than 50 kg were within this dosage range of acetaminophen. The hydrocodone/acetaminophen elixir contained 0.5 mg hydrocodone per 33 mg of acetaminophen. Therefore, in order to receive both hydrocodone and acetaminophen in the recommended dose range, patients weighing less than 50 kg must be prescribed at least 0.15 mg/kg of hydrocodone as recommended on the pre-printed order forms. Three patients who received hydrocodone also received PRN morphine (1 patient, 2 doses), hydromorphone (1 patient, 2 doses), and ibuprofen (1 patient, 1 dose). Biobehavioral interventions were also used with five of the patients who received hydrocodone: three patients were repositioned, one was consoled by her father, and distraction was encouraged for another patient who received hydrocodone.

**Codeine** was given to five patients, only one patient received more than one dose and this patient only received two doses. Patients who received codeine did not receive any additional PRN analgesics, but one patient was also consoled and provided with a pacifier. Only one patient who weighed over 50 kg was prescribed Tylenol with Codeine #3's with 30 mg of Codeine and 300 mg of acetaminophen per tablet. The patient was prescribed two tablets. Dosages ranged 0.5 to 1.1 mg/kg for patients who weighed less than 50 kg. The American Pain Society (2009) recommends a starting dose of 0.5 to 1 mg/kg. Unfortunately, the Tylenol with Codeine elixir contains only 25 mg of acetaminophen to every 2.4 mg of codeine. So the acetaminophen dosages ranged from 5 to 11.2 mg/kg for patients less than 50 kg and only one patient received over 10 mg/kg of acetaminophen.

**Morphine** was given to 3 patients. One patient each received one, two and three doses during their nurse's shift. One patient who received morphine also received 7.5 mg of PRN hydrocodone. This patient was also encouraged to use distraction with crafts for pain management.

. Two patients received **hydromorphone**, but one patient received a 50% increase in his subsequent dose. This patient also used a heating pad for pain relief. The other patient who received hydromorphone was on a PCA and received a PRN nurse bolus dose. In addition, this patient was encouraged to play a game for distraction to manage her pain until her PCA could again be patient activated.

. One patient received **acetaminophen** and another **ibuprofen** as PRN doses. The patient who received acetaminophen was also consoled by her mother. The patient who received ibuprofen also received a dose of hydrocodone and was repositioned for comfort.

Ten different nurses **negotiated the administration** of analgesics with 17 patients and their parents. “You have to take your medicine, here you go. Oh, you have something in your mouth." The grandmother of this two year old patient takes food out of his mouth so the nurse can give the analgesic. Much of the negotiation focused on masking the taste of the analgesics. At least three nurses mixed Lortab elixir with syrpalta, one after a parent request and another after a grandmother’s request. “What do you want me to bring to drink? If you have something strong, like orange cranberry, it will mask the taste of the Lortab.” The patient chooses, "Orange juice." The nurse even advises, “You could start to practice swallowing pills with M&Ms.” The mother explains, "Last time she went home with antibiotic pills, three times per day, so she got good at taking those and she likes it better than the liquids.” Yet the patient was prescribed ten milliliters of Lortab. As previously discussed, nurses also required patients to eat before giving oral analgesics and negotiated the timing of analgesic administration.

Two nurses **rewarded** two patients for taking their oral analgesics. One mother explained, "We discussed how medicine did not make us sick last time, it just helped." The nurse offers a reward, "And then you can have a popsicle." Another patient is more resistant, "I don't want to take it." The nurse offers the same reward, "I know because it tastes kind of yucky. Maybe when you are done you could have a popsicle or Jello." This patient balks at the reward, "No, I just don't want to take it." After taking the analgesic, the nurse ups her reward offer, "Maybe I can find you a special prize would you like that?" This time the patient agrees, “Yes." The nurse presents the patient with her choice between two gift baskets of toys. The gift baskets were actually being distributed to all the patients.

Nurse relied on parent’s assistance to intervene with analgesics. While parents assisted nine nurses with medication administration for nine patients, parents of the children two to seven years of age preferred not to administer the analgesic. As a nurse squirts an oral syringe of medicine in a 2 year olds mouth, he pushes the nurse away. His father restrains his arms and coaches, "You take that and then you can have some juice." One parent preferred to administer the medication when confronted with her seven year old daughter’s attempt to administer her own medication.

Parents of the three children under a year of age did give the analgesic to their infants. A nurse asks the mother of a nine month old after cleft palate repair, "Do you want to give pain med or want me to?" The mom replies, "It doesn't matter." However, when the nurse brings in the Lortab the mom gives it back to the nurse and asks her to mix the Lortab with the "grape stuff.” A one year old cries as her mother gives the Lortab. The mother assists the patient in sitting up and gives sips of apple juice between sips of the dose. The patient is coughing as the mother tries to give analgesic dose. Another nurse really never gives the mother of a one year old who had a cleft palate repair the option, she merely hands the mother the dose and asks, "Is this what she took last time?" The mother replies, "It may have been less."

#### 4.3.4.2 PRN Biobehavioral interventions

Pediatric Registered Nurses intervened with a variety of biobehavioral interventions. Two patients were swaddled and one was given a pacifier. One patient each was consoled by their mother, father, and nurse. The nurse also gave the child a pacifier. Three patients were repositioned, one was repositioned twice. All of the patients who were repositioned had orthopedic surgeries. One patient was given a heating pad twice by patient request. Three patients were encouraged to use distraction, but one was distracted with a game, another with crafts and the third with a television show. One patient's pain was relieved by removing her intravenous catheter. Nurses also encouraged patients to walk. One nurse explained to a patient three days after pectus carnitum repair, "We want you to move and walk that will keep you from getting stiff and sore."

All but three patients who received biobehavioral interventions also received analgesics. The three patients who did not receive analgesics were two who were swaddled and the one patient whose pain was relieved by removing her intravenous catheter. Biobehavioral interventions were usually given when it was not time for the next dose of an analgesic. For example the infant who was given acetaminophen two hours earlier, the adolescent who was given Vicodin less than one hour before requesting more analgesia, and the child who was coached, "You can push your button when it blinks, play your game until then." Nurses, parents, and a child life specialist coached four patients through biobehavioral interventions. Biobehavioral interventions, like heating pads, were also given by request to supplement analgesia.

Nurses selected "dimmed lights" for three patients from a list of non-pharmacologic pain management interventions in their computerized charting. For each of these observations, the lights were off when the nurse assessed the patient's pain, as opposed to dimmed as a management intervention. All of these observations were before the privacy screens were installed, so this may be charted more frequently.

Parents provided or assisted nurses with providing biobehavioral interventions four times during the observations. As previously mentioned parents consoled their infants. Parent's also assisted in repositioning patients after orthopedic surgery. A mom repositioned her daughter in bed and the patient screams "Oh, my fingers hurt." The nurse asks, "Which fingers?" The patient retorts, "The ones with the cast on it, which ones do you think?" Her mother responds, "Hey don't be disrespectful." Another patient requests while he is being repositioned in bed, "I want my mom to do it."

4.3.4.3 Intervention summary

Of the 46 post-surgical patients all but 7 had analgesics ordered. Four patient's surgeries were 5 to 12 days prior to the observation. Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention **cases**, pediatric Registered Nurses intervened with analgesics 43 times and biobehavioral interventions 15 times. Of the 12 patients who received PRN analgesics and were discharged during the observed shift, only 2 received more than one dose of an analgesic. There were only three patients who were admitted and received PRN analgesics, and only one of these received more than one dose of an analgesic.

**Hydrocodone** was the most common PRN analgesic given. Dosages for patients who weighed over 50 kg were consistent with the American Pain Society's (2009) recommendations. All but two patients who weighed less than 50 kg were within the American Pain Society's (2009) recommendations. Hydrocodone products used also contain acetaminophen. All patients who weighed over 50 kg, but only two patients who weighed less than 50 kg were within the recommended acetaminophen dosage range (American Pain Society, 2009). In order to receive both hydrocodone and acetaminophen in the recommended dose range, patients who weighed less than 50 kg must be prescribed at least 0.15 mg/kg of hydrocodone as recommended on the pre-printed order forms. Three patients who received hydrocodone also received PRN morphine (1 patient, 2 doses), hydromorphone (1 patient, 2 doses), and ibuprofen (1 patient, 1 dose). Biobehavioral interventions were also used with five of the patients who received hydrocodone.

**Codeine** was given to five patients. Only one patient who weighed over 50 kilograms was prescribed Tylenol with Codeine. Dosages ranged from 0.5 to 1.1 mg/kg for patients who weighed less than 50 kilograms which was consistent with the American Pain Society recommendations. Unfortunately, the Tylenol with Codeine product contains only 25 mg of acetaminophen to every 2.4 mg of codeine. So, only one patient weighing less than 50 kg received the recommended dose of acetaminophen (American Pain Society, 2009).

IV opioids were rarely administered. Intravenous **Morphine** was given to 3 patients. Two patients received intravenous **hydromorphone.** One patient each received oral **acetaminophen** and **ibuprofen** as PRN doses.

Ten different nurses **negotiated the administration** of analgesics with 17 patients and their parents. Much of the negotiation focused on masking the taste of the analgesics. Two nurses **rewarded** two patients for taking their oral analgesics, one with a popsicle the other with a gift basket.

Nurse relied on parent's assistance to intervene with analgesics. Parents of the children two to seven years of age preferred not to administer the analgesic. Parents of the three children under a year of age did give the analgesic to their infants.

Nurses also relied on parent's assistance for providing **biobehavioral interventions.** Parents provided or assisted nurses with providing biobehavioral interventions four times during the observations. As previously mentioned parents consoled their infants. Parent's also assisted in repositioning patients after orthopedic surgery.

Pediatric Registered Nurses intervened with a variety of biobehavioral interventions: swaddling, pacifier, consoling, repositioning, heating pads, and distraction. All of the patients who were repositioned had orthopedic surgeries. All but three patients who received biobehavioral interventions also received analgesics. The three patients who did not receive analgesics were younger. Some nurses used biobehavioral interventions to bridge the time until an additional analgesic intervention was due. Biobehavioral interventions were also given by request to supplement analgesia.

*4.3.5 Validation from nurses' post-shift interviews*

Nurses were briefly interviewed after each shift to obtain their evaluation of the shift. They were asked to share their care priorities and whether these had changed during the shift.

They were also asked to state their pain management goals and whether they achieved their pain goals. This information was reported in Section 4.2.2 & Table 4.7. Nurses were also asked what helped or hindered their efforts to meet those goals.

One experienced nurse thoroughly discussed the challenges she confronts to manage pediatric patients' post-surgical pain. "I don't know if the kids understand the pain scale. I usually explain to kids zero is no pain and ten is - I'll give them an example like crying. I think some of the older ones expect to be pain free. Our pain team tells us that a four is comfortable, they don't expect kids to be pain free. I try to explain they are going to be sore - I don't want them in pain. I wish they would put everyone on something scheduled at least for the first day after surgery. Some nurses only think of medicine for pain. I think ambulating really helps - It helps with respiratory effort, pain and prevents DVTs. I'm an old nurse they joke give them to me, I'll get them up and walking, but I think it helps. Are you finding that parent's affect pain management?"

#### 4.3.5.1 Care priorities

If nurses included pain as a care priority, it was their first or second priority. Seven nurses stated that their first priority was pain management, pain control or comfort. One nurse elaborated on this priority, "First pain management - that was number one 'cause all my kids were post-op." Another nurse joked, "Well since you were here pain control of course, no, (laughs)." Pain, pain management, or patient comfort and needs was the second stated priority for three nurses. This priority ranked second to "taking care of patient's needs," "ABCs," "neurovascular checks, high risk for compartment syndrome," and "bowel function." One of these nurses listed her priorities by patient. "Pain," was the second priority for two of her three patients. Nurses who included pain as one of their care priorities also stated one to six other care priorities, including: fluid and electrolyte balance (2 nurses), hydration, intake and output, monitor oxygen levels, circulation, neurochecks (2 nurses), trying to find a reason for fever and getting the antibiotics started, infection control, discharge and diabetic education (2 nurses), impaired skin integrity, thermoregulation, social needs, maintain a patients IV, IV therapy, medication administration, “getting meds done on time,” getting patient to procedure on time, “emotional support and education is always really high priorities in my book and looking out for best interests was a high priority for several of my patients today.”

The nurse who did not have any patient’s in pain during her shift listed her care priorities as: emotional support, verify traction, adequate oxygen, and neurocheck. Other nurses who did not include pain as one of their care priorities stated monitoring during blood administration, educating parents, initially routine care and then discharge patients, as their care priorities.

When asked if their care priorities changed during the shift, four nurses responded, “No;” and one responded, “Not really, it was pretty much the same.” Only two nurses indicated getting an admission changed their care priorities. Other nurses who said, “Yes,” explained the reasons, “with changes in patient status like temperature” and “getting (a patient) settled.” One nurse mentioned pain when explaining the change in her care priorities, “more worried at beginning of neuro but shifted to more meeting her comfort needs.” Another nurse listed the changes by patient for three of her patients, “Priority was finding out why fever then changed to getting him prepped for OR, I still wanted to stay on top of his pain but then was concerned about what was causing his light-headedness, and priority changed from basic care to discharge preparation.”

4.3.5.2 Nurses’ reports of what helped and hindered

Nurses were asked what helped or hindered them from achieving their pain goals during the observed shift. Nurses listed one to eight things that **helped** them achieve their pain goals. Only one nurse mentioned biobehavioral techniques, but she mentioned two, ice and distraction. She also mentioned analgesics.

Medications were most frequently mentioned as helping items. Nurses stated, “Having meds ordered.” but also expanded on this theme, “having meds I needed ordered and available to give," "the correct medicines being ordered," "meds on the floor in a timely manner – even new meds," and "clear physician orders - orders that had to be clarified was a deterrent." One nurse provided an example, surprisingly this was an example of not having analgesics ordered, "Having pain meds ordered and because (patient) didn't even have meds ordered to begin with." One nurse specifically mentioned a pain medication delivery device, "PCA."

Five nurses identified their ability to time medications as something that helped achieve their pain goals. Two nurses stated "anticipate needs." One had pre-medicated her patients with analgesics for dressing changes and the other had used advanced planning for analgesic administration. Another nurse termed this, "pre-emptive strike, planning, intervening before." She also planned an intervention and pre-medicated a patient for physical therapy. One nurse stated, "Time management…Remembering the times I can give medicine, because if I have to check it takes time away from when I can give it."

Five nurse recognized frequent assessment as helping to achieve pain goals. Three of these nurses further clarified, "Frequently asking," "reassessment," and, "assessing before and after medication." Another nurse stated, "Efficient communication with patients."

Two nurses mentioned two nursing characteristics. One nurse thought her 11 years of nursing experience helped. Another mentioned, "staying focused." Four patient characteristics were also mentioned as helping nurses to achieve their pain goals. One nurse stated, "Kids pretty easy, didn't have a lot of pain." Another mentioned a patient did, "really well with distraction." A third nurse stated her patient was compliant. A more general characteristic mentioned by another nurse was, "Couple days post-op so easier to manage pain."

Parents were identified by three nurses for helping nurses achieve their pain goals. One nurse qualified her answer, "Parents who were active in plan of care." Another focused on listening to the parents and "what they saw."

Three nurses mentioned the care team, "Cooperation and help of co-workers." The care team members mentioned included: "Charge Nurse helping," "Pharmacist called back immediately when I call with change or questions," "Unit Secretary who is helpful, kind, and gets things done quickly," and "Doctors who are friendly." One nurse mentioned the, "Environment."

Nurses identified far fewer things that **hindered** them from achieving their pain goals during the observed shifts. This may be a reflection of nurses' overall conclusions that they had achieved, mostly or partially achieved their pain goals. The most factors a nurse identified as hindering her efforts was four. Three nurses reported that "nothing" hindered achieving their pain goals.

One nurse replied, "Nothing, except for sometimes getting med pulled upon MAR before verified by pharmacy." Another nurse also reported the delay in ordered medications being verified by pharmacy and available when her patient transitioned from the pediatric intensive care unit, "pain out of control, playing catch up." A nurse noted her pain management orders missing as a hindrance and another noted "Having to clarify orders - make phone calls-delays in return phone calls."

Co-signing analgesics was also mentioned, but two of the four nurses who mentioned this hindrance qualified their answer, "Nothing today, waiting for a witness can, but not today, and "Wait for co-sign, but not bad today." Two other nurses mentioned co-sign and patient load.

Only one nurse mentioned a patient characteristic as a hindrance to achieving her pain goal. She stated, "Patient's low pain tolerance." She was referring to the 16 year old patient who was on her fourth post-operative day after arthroscopy of right knee with synovial debridement and lateral release.

Computer issues and slowness of the computers hindered two nurses. One of these nurses spent over 90 minutes waiting or working with information systems personnel due to computer password and sign-on problems. This nurse worked a 13 hour and 32 minute shift, approximately 90 minutes overtime.

Lack of communication between the surgeon and physician assistant was also mentioned as a hindrance to achieving a nurse's pain goals. One nurse mentioned "multitasking." Interruptions were also mentioned, The nurse who mentioned this challenge was interrupted 13 times. This was consistent with the average number of interruptions per shift of 16; but far less than the maximum of 51 interruptions observed during one nurse's shift. A unique challenge was mentioned by one nurse who also gave supporting examples, "Some parents talk about things that aren't pertinent to care and you don't want to be rude, but you have other things to do."

4.3.5.3 Perspectives summary

Nurses were briefly interviewed after each shift to obtain their evaluation of the shift. They were asked to share their care priorities and whether these had changed during the shift, their pain management goals, whether they achieved their pain goals, and the factors that helped or hindered their efforts to meet those goals.

If nurses included pain as a care priority, it was their first or second priority. Seven nurses stated that their first priority was pain management, pain control or comfort. Three nurses stated pain, pain management, or patient comfort was their second priority. Other nurses who did not include pain as one of their care priorities stated monitoring during blood administration, educating parents, initially routine care and then discharge patients, as their care priorities. When asked if their care priorities changed during the shift, four nurses responded, "No." Only two nurses indicated getting an admission changed their care priorities. One nurse mentioned pain when explaining the change in her care priorities. Another nurse wanted to stay on top of her patient's pain but admits she was concerned about what was causing his light-headedness.

Nurses listed one to eight things that **helped** them achieve their pain goals. Only one nurse mentioned biobehavioral techniques. Medications were most frequently mentioned as helping items. Five nurses identified their ability to time medications as something that helped achieve their pain goals. Five nurse recognized frequent assessment as helping to achieve pain goals. Two nurses mentioned two nursing characteristics. Patient characteristics were also mentioned as helping nurses to achieve their pain goals. Parents were identified by three nurses for helping nurses achieve their pain goals. Three nurses mentioned the care team.

Nurses identified far less thing that **hindered** them from achieving their pain goals during the observed shifts. This may be a reflection of nurses overall conclusions that they had achieved, mostly or partially achieved their pain goals. Three nurses reported that “nothing” hindered achieving their pain goals. Four nurses reported processing medications was a hindrance, including clarifying orders, having them verified by pharmacy, and availability for administration. Co-signing analgesics was also mentioned, but two of the six nurses who mentioned this hindrance qualified their answer, “But not today.” Two other nurses mentioned patient load as a hindrance to achieving their pain goals. Only one nurse mentioned a patient’s low pain tolerance as a hindrance to achieving her pain goal. Computer issues and slowness of the computers hindered two nurses. Lack of communication between the surgeon and physician assistant was also mentioned as a hindrance to achieving a nurse’s pain goals.

*4.3.6 Other influences related to assessing and managing children’s pain*

4.3.6.1 Communication among medical staff

There were six examples during four different shifts which illustrate the hindrance poor communication among the medical staff can have on managing a pediatric patient’s post-surgical pain. The first example involved the 16 year old patient who was on her fourth post-operative day after arthroscopy of right knee with synovial debridement and lateral release. The charge nurse explains, “I spoke to pain nurse and she thought she had already gone home.”

The second example involved the 6 year old who had an open reduction and internal fixation of her left elbow the previous day. The resident surgeon explains to the family, “Can go back to school when not taking any narcotic pain medicine…She can take Motrin or Advil." Three hours later the surgeon instructs the nurse, "Hold discharge for (patient). Resident's a bit overzealous. She's anxious and she has a bad injury to wrist and thumb. We will check her again.” The patient’s pain and nausea remained a challenge. The nurse tells the patient who is refusing Lortab, “I just don't think the Tylenol or Motrin is going to cut it.  I know (resident surgeon) says we give too many narcotics, but I think you need it.” (see more details in appendix E)

At 18:40, an observed nurse discusses with an attending surgeon orders for the 15 year old female who had a laparoscopic cholecystectomy. The surgeon asks, "I wouldn't put her on Toradol, who put her on Toradol?" The nurse replies, "The doctor on call." The patient has received three doses, the first dose at 06:00.  The surgeon explains, “I wouldn't have her on Toradol because of the bleeding, I asked to up her morphine.  Is she getting Lortab or morphine?  The nurse answers, "Both." The surgeon shares his concerns,  "It's too unpredictable: one could be peaking and other peaking"  The nurse reviews the written orders with the surgeon.  He asks, "What does this say? The nurse identifies, “That's 8 mg of morphine,” and goes on to detail the time the patient received Vicodin and when morphine was given.  The surgeon states, "She's on Vicodin, morphine and Toradol."  The nurse comments, "Well?"  The surgeon explains again, "It's just not right.  It is too unpredictable.  Morphine should be given every 2 hours, not 3 to 4 and Vicodin 5 mg.”  The nurse interrupts, "I had him change it to 7.5mg.”  The surgeon states, "But it should be 10, it is not enough for her size." The next example comes from the same nurse’s shift, although her shift should have ended, and relates to the same patient.  The nurse is asked an hour later by the night charge nurse if she cared for this patient today.  The night charge nurse states, “When I called the surgeon about Flexiril, she (the patient) said she takes it at home, but didn't tell anyone and doctor (the surgeon) was upset that he told PA to write all her home meds."  The observed nurse comments, "Communication has been a problem there."

The final two examples come from another nurse’s shift.  The first relates to the 9 year old who had excision physeal bar right femur three days earlier.  During report, the night charge nurse alerts the nurse to the communication problem. "CRNA came up and pulled it, and didn't want to write anything for pain because she said she doesn't know this kid.  So we called the surgeon for Motrin and he wanted us to wait another hour for the resident to come on, but we explained fever already at 40." The observed nurse comments, "Seems like an incident report needs to be written up to get everyone on the same page, so they know what to do when they are on call." Later in the same shift, this nurse coaches a surgeon regarding what his patient has ordered for pain (see section 4.5).

4.3.6.2 Knowledge deficit

The most common knowledge deficit related to nurses' understanding of the mechanism of nausea and the potential for nausea from opioids. The medication administration record had a note "take with food to avoid GI upset" for all ordered oral opioid containing analgesic. Six of the seven nurses with over three years of experience and one of the nurses with less than three years of experience required patients to eat prior to administering an oral opioid containing analgesic. Experienced nurses even delayed analgesic administration until patients had eaten. "You probably know this, but don't give (Lortab) on empty stomach or it can make her sick." Nausea from opioids, however, is related to their central mechanism of action, not a local effect. Nausea from opioids are the result of their binding to receptors located in the fourth ventricle of the brain (Pasero, Portenoy and McCaffery, 1999). There is no evidence that taking food with oral opioids will "avoid GI upset." Opioid-related nausea and vomiting, whether from oral or intravenous formulations, should be treated with centrally acting antiemetics, like Ondansetron (Zofran) (American Pain Society, 2009).

Additional knowledge deficits were rare, but eight were overheard and observed during five shifts. Three were related to analgesic dosing, two were related to procedural pain management, and the other three were unique. Nurses, physician assistants, and pharmacists had analgesic knowledge deficits.

The nurse enters the automated medication dispensing machine and pulls the patient's dose of Vicodin. She comments, "Doesn't seem like a lot for a big kid like him." The dose is 5mg of hydrocodone with 500 mg of acetaminophen. This is the recommended starting dose for adult sized patients, patients weighing over 50 kg (American Pain Society, 2009). The patient weighed over 100 kg. In report, the nurse is informed this patient had no complaints of pain, and has not received any PRN analgesics. He has no pain when assessed prior to the nurse retrieving this first dose in advance of physical therapy.

Another nurse is challenged to determine an appropriate hydrocodone dose for an 89 kg patient. The physician assistant orders 5mg of hydrocodone with 500 mg of acetaminophen. The patient has been receiving 6 mg of intravenous morphine for pain without sedation or untoward side effects. The nurse requests a dose increase to 7.5 mg before giving the first dose. While the nurse recognizes the dose is low on the adult dosage range and low for this particular patient, the nurse and physician assistant fail to realize that it is low in comparison to the morphine dose she is requiring. The equianalgesic dose of 6 mg of intravenous morphine is 18 mg of hydrocodone (American Pain Society, 2009). Conservative prescribers would recommend halving the dose due to incomplete cross tolerance (Pasero, Portenoy, & McCaffery, 1999). The suggested hydrocodone dose for this patient based on these equianalgesic principles is 9 mg. The physician assistant later calls the nurse back and asks her to write a clarification order to change the Lortab dose to every 6 hours instead of every 4 hours. He is concerned that providing this dose every 4 hours will exceed the patient's daily acetaminophen limit. This order change drops the maximum daily acetaminophen for this patient from 3 grams to 2 gram. The American Pain Society recommends less than 4 grams of acetaminophen per day for adult patients (American Pain Society, 2009). There is nothing in the patient's history to suggest the need for a more conservative acetaminophen limit.

A more common knowledge deficit relates to differentiating adverse reactions from allergies to opioids. Another nurse is told in shift report that her patient received Lortab at 20:00 and Benadryl at 4:45 for "Lots of pruritis." The nurse is told the patient has an allergy to codeine and that the pharmacy was called, but stated there was no relation. Instead pharmacy stated this could be an adverse reaction to hydrocodone. Codeine and hydrocodone are semisynthetic opioids made by simple modification of the morphine molecule (Yaster, Kost-Byerly, & Maxwell, 2003). These phenanthrenes have similar molecular structures. If the patient is truly allergic to codeine, administration of hydrocodone would be unwise. Instead, a synthetic opioid preparation such as a methadone derivative or phenylpiperidine derivative, like fentanyl or Darvocet, should be recommended.

Adverse reactions, such as nausea and pruritis, are more common than actual allergic reactions to opioids (Pasero, Portenoy, & McCaffery, 1999). Tolerance to both nausea and pruritis from opioids typically occurs within days of repeated exposure to these analgesics. The resident surgeon is asked about pruritis with codeine and hydrocodone. He identifies that pruritis is an adverse reaction, not an allergic reaction. He also emphasizes, there is “not a lot to send her home on;” and he doesn't want to send her home on Darvocet. Darvocet is not molecularly similar, but is no longer recommended for analgesia by the American Pain Society (American Pain Society, 2009).

One of the nurses being observed discusses fever and epidural analgesia. She reports she had asked during her previous shift that the epidural be pulled, “because it can cause fever.” The nurse’s knowledge deficit was her misunderstanding that the epidural is pulled so that the catheter in a bacteremic or septic patient does not become a conduit to seed the infection into the central nervous system. She thought the epidural caused the fever and was pulled to reduce the source of the fever. This nurse also expressed uncertainty of the effectiveness of Nubain for pruritis and failed to identify Nubain’s analgesic properties.

The last two examples of knowledge deficits related to the procedural pain management of a patient requiring an intravenous start, although one also relates to lack of understanding of epidural analgesia. The teenager cries with application of tourniquet. The nurse suggests, "OK, does she have a button she can push." The second nurse says, "Yes;" and hands the patient controlled epidural analgesia button to the patient." The nurse asks, "Did you punch the button?" The patient responds, "Yes, but it doesn't work." The nurse asks, "Oh-did you just punch it?" In order for an epidural to provide analgesia to an arm or hand, the epidural would have to have spread to the cervical level. This level of analgesia would result in respiratory compromise. Therefore, epidural analgesia is inappropriate for achieving pain control of an arm or hand. The nurse also applies EMLA to two potential intravenous sites. She states, "It kind of numbs it a bit. I'll leave it on for 30 to 45 minutes." The nurse informs the researcher, "I don't like EMLA because I think it causes vasoconstriction." The researcher informs to be effective EMLA should be left on for a minimum of 60 minutes; and that EMLA is biphasic (American Pain Society, 2009, Baxter, Ewing, Evans, Manworren, Ware, & Mix, 2005). If the clinician waits 15 minutes after removing the EMLA, there will be vasodilation. The nurse followed this advice and was impressed by the results, obtaining the intravenous with one painless (according to the patient) attempt. The nurse immediately shared this new knowledge with other clinicians.

#### 4.3.6.3 Education

Nurses educated parents and grandparents about analgesic effects, specifically onset and duration of analgesic action, as well as side effects, like pruritis and sedation. Nurses recommended patients eat to prevent analgesic related nausea; and they recommended that they walk to prevent stiffness and soreness.

Nurses provided additional analgesic education upon discharge. As previously discussed, nurses educated parents and grandmothers about analgesics containing acetaminophen as part of their discharge education. Two nurses also discussed using Motrin to supplement the patient’s home analgesic needs, "She is going to go home with Lortab elixir 10 ml (taking 7.5 while in hospital).” The patient’s mother asks, "Is that like Motrin?" The nurse explains, "No, this is the one I gave her earlier, the Lortab. The Toradol I was giving IV is like Motrin." The mother restates her understanding, "So I can keep giving the Motrin, cause this is the one (Lortab) I would want to get her off of." The nurse further explains, "The best thing is to alternate them, since this one is only every four hours, so she can have it again at noon."

Nurses failed to identify when discharging patients who had received intravenous Toradol, that 30 mg of this non-steroidal anti-inflammatory drug (NSAID) is equivalent to 6 mg of intravenous morphine. Nurses informed parents and grandmothers when patients where prescribed more or less of analgesic for home then they were receiving during their hospital visit, "When she goes home she will only be on one Lortab. We were giving her two here but she'll be on just one as needed for pain." Nurses did not attempt to clarify these discrepancies with prescribers or provide any additional guidance to families regarding these discrepancies.

#### 4.3.6.4 Documentation

Five issues with pain management related documentation were observed during three shifts. One documentation issue was a potential medication error. Two nurses checked pump settings for an epidural. The observed nurse suggested writing waste volume on the label. The nurses then noted the label on the drug was unclear. The label contained the “formula” for the solution, but not the final concentrations of the epidural solution ordered or listed on the previous cartridges label. Nurses also documented remaining epidural and PCA volumes on a separate piece of paper that was not included in the medical record, but was stored in a notebook for pharmacy to pick-up. During one observation, a nurse was asked to reconcile this documentation from a shift worked the previous week. The nurse retrieved the data from the patient’s medical record.

Three of the documentation issues presented in the last hour of the nurses’ shifts. One nurse noted at the end of her shift that she had charted giving morphine to the wrong patient. Morphine had been ordered for both patients. During the observation of one of the experienced nurses, two other nurses approached her about documentation issues at the end of the shift. One asked that she co-sign in the electronic medication administration record the administration for 1 mg of morphine which was previously witness by a third nurse. Another nurse asked, "Do you consider epidural PCA in pain assessment?" The observed nurse showed the second nurse where to document this information. Nurses documentation frustrations did not seem to influence care merely the documentation of care.

4.3.6.5 Assessment and management of other pains

Ten nurses also assessed and managed non-surgical pain and the pain of procedures. Nurses used tape remover and soaked off bandages to limit the pain of dressing removal. Eight nurses investigated the pain from intravenous catheters, removing three catheters. Cold spray and eutectic mixture of lidocaine anesthesia were used to start new intravenous catheters. Four nurses coached patients through the pain of sub-cutaneous injections, like insulin and heparin, and the removal of a peripherally inserted central catheter. However, nothing was done to prevent the pain of blood draws.

4.3.6.6 Summary of other influences

There were six examples during four different shifts which illustrate the hindrance poor communication among the medical staff can have on managing a pediatric patient's post-surgical pain. This hindrance was further magnified by nurses' resistance to consult prescribers unless they were on the unit making patient rounds.

The most common knowledge deficit related to nurses' understanding of the mechanism of nausea and the potential for nausea from opioids. The medication administration record had a note "take with food to avoid GI upset" for all ordered oral opioid containing analgesic. Six of the seven nurses with over three years of experience and one of the nurses with less than three years of experience required patients to eat prior to administering an oral opioid containing analgesic. Experienced nurses even delayed analgesic administration until patients had eaten. Nausea from opioids, however, is related to their central mechanism of action, not a local effect. There is no evidence that taking food with oral opioids will "avoid GI upset."

Additional knowledge deficits were rare, but eight were overheard and observed during five shifts. Three were related to analgesic dosing, specifically hydrocodone dosing for adult sized patients, equianalgesic conversion, and acetaminophen daily limits. Differentiating the adverse effect of pruritis from an allergic reaction was another analgesic knowledge deficit. Two specific knowledge deficits were unique, the rationale for epidural catheter removal for febrile patients and the effects of Nubain. Two knowledge deficits were related to procedural pain management. Nurses, physician assistants, and pharmacists had analgesic knowledge deficits.

Nurses educated parents and grandparents about analgesic effects, specifically onset and duration of analgesic action, as well as side effects, like pruritis and sedation. Nurses recommended patients eat to prevent analgesic related nausea; and they recommended that they walk to prevent stiffness and soreness. Nurses provided additional analgesic education upon discharge, including acetaminophen limits. Nurses failed to clarify discharge dose discrepancies with prescribers or provide any additional guidance to families regarding these discrepancies.

Five issues with pain management related documentation were observed during three shifts. One documentation issues was a potential medication error. The nurses noted the label on a drug unclear. Nurses were required to provide duplicate documentation of the remaining epidural and PCA volumes on a separate piece of paper that was not included in the medical record. Three of the documentation issues presented in the last hour of the nurses' shifts. One nurse noted at the end of her shift that she had charted giving morphine to the wrong patient. Nurses documentation frustrations did not seem to influence care merely the documentation of care.

Nurses also assessed and managed non-surgical pain and the pain of procedures. Anesthetics were used for intravenous catheter insertion. However, only biobehavioral interventions were used to ineffectively prevent the pain of subcutaneous injections or blood draws.

## 4.4 Categorized Influences

Aim #2: Categorize factors observed to influence pediatric nurses' abilities to care for patients using the seven dimensions of bureaucratic caring: (1) political, (2) technologic/physiological, (3) economic, (4) legal, (5) spiritual/religious, (6) social/cultural, and (7) educational.

The pain assessment to intervention influences identified during observations and interviews of 14 pediatric nurses delivering care to 46 post-surgical patients were described in the previous section. The influences identified and their fit with the humanistic and bureaucratic dimensions of caring as defined (second column of Table 4.13) by Ray (1989) is reported in the fourth column of Table 4.13. The researcher and the Director of Nursing Research at the study site independently categorized influencing factors according to seven dimensions of bureaucratic caring. Differences in categories were reconciled through consensus. The specific care dimensions as they relate to acute pain management and how nurses negotiate these dimensions of caring to relieve acute post-operative pain for patients in a pediatric post-surgical unit setting will be reported in the next section.

Table 4.13 Comparison of Bureaucratic and Humanistic Dimensions

| **Bureaucratic** | Ray's Aspects | Adapted Model | **Categorized Influences** |
|---|---|---|---|
| **Political** | • Role stratification<br>• Division of labor<br>• Power<br>• Decision making<br>• Communication patterns<br>• Regulatory influences<br>• Distribution of resources within an organization | • Regulatory Requirements<br>• Orders<br>• Communication / Escalation | • Patient handoff<br>• Analgesics not available<br>• Parents and Grandmother's roles<br>• Letting the patient decide<br>• Prompted Assessment<br>• Nurses' decisions<br>• Consultation and Teamwork |
| **Economic** | Allocation of resources to provide care while maintaining the viability of the system. | • Workload (Acuity)<br>• Travel time<br>• Time with patients<br>• Staffing | • Interruptions & Delays<br>• Travel for Analgesics (no liquids)<br>• Gather other liquids (food) to get oral analgesics down |

Table 4.13- *Continued*

| | | | |
|---|---|---|---|
| **Technologic / physiological** | Knowledge and skill to operate and use equipment to maintain the physiological functions of the patient. | • Diagnosis<br>• Patient condition<br>• Post-op Day<br>• Physiologic changes<br>• Behavioral indictors of pain<br>• Pain technologies (PCA, epidural)<br>• Analgesic actions & side effects<br>• Unit layout | • Post-op Day<br>• Numbers Pain Scale<br>• Behaviors<br>• Advance planning<br>• Analgesic actions, side effects & Biobehavioral interventions<br>• Rate of IV push |
| **Legal** | • Responsibility<br>• Accountability<br>• Liability<br>• Right<br>• Rules and guiding principles of behavior. | • Witness<br>• Parental presence<br>• Prescriptive authority | • Witness<br>• No analgesic orders |
| **Humanistic** | Ray's Aspects | Adapted Model | **Categorized Influences** |
| **Spiritual / religious** | • Acts of faith<br>• Empowerment<br>• Creativity<br>• Choice<br>• Hope<br>• "Brotherly love." | • Pain goal | • Nurse's Goals |
| **Social/Cultural** | • Communication<br>• Compassion<br>• Concern<br>• Involvement<br>• Intimacy<br>• Love<br>• empathy in caring<br>• Respect and trust in providing care<br>• Adhering to culturally defined standards of moral behavior | • Reports of pain<br>• Age, gender, ethnicity<br>• Length of stay<br>• Non-pharmacologic interventions<br>• Patient familiarity | • Patient Age<br>• Communicate pain expectations<br>• Assessment timing<br>• Pain alert<br>• Broken promises<br>• Negotiating giving oral analgesics |

Table 4.13- *Continued*

| | | | |
|---|---|---|---|
| **Educational** | • Educational programs<br>• Information<br>• Teaching | • Nurses degree<br>• Pt experience<br>• Nurse experience<br>• Nurse's level | • Nurses' Knowledge<br>• Pt previous pain experience<br>• Educate |

## 4.5 Description of Care Dimensions Related to Acute Pain Management

Aim #3: Describe the specific care dimensions as they relate to acute pain management and how nurses negotiate these dimensions of caring to relieve acute post-operative pain for patients in a pediatric post-surgical unit setting.

The Theory of Bureaucratic Caring has been previously used to explore nurse-patient relationships, but only from a nursing administration perspective (DiDominic, 1995; Landry, 2001). Characteristics of the dimensions as gleaned from these past studies are listed in the second column of 4.12. Turkel (1999) emphasized the value of this theory to guide clinical practice as well as research and nursing administration. This study, however, is the first attempt to apply this theory to clinical practice in research (Ray, personal communication, October 29, 2004). Research that focuses on clinical problems and clinical practices may provide further support and definition for the dimensions of caring described in this theory. Weighting of the dimensions of caring may vary from Ray's original model as the result of the approach and perspective of the inquiry.

In an effort to understand factors nurses negotiate in their work of assessing and managing pediatric postsurgical pain, Ray's model of Bureaucratic Caring was adapted. Potential variables for exploring pediatric nurses' postsurgical pain management practices were defined as listed in the third column of Table 4.13 based on the literature review and a pilot study. But the emphasis of this study was to further identify influences and perhaps verify these variables.

Influences identified and previously described to meet Aim #1 were independently categorized by the researcher and the Director of Nursing Research at the study site according to seven dimensions of bureaucratic caring. Differences in categories were reconciled through consensus. These influences were then collapsed into the themes listed by care dimension in the fourth column of Table 4.13. In this section, the specific care dimensions as they relate to acute pain management and how nurses negotiate these dimensions of caring to relieve acute post-operative pain for patients in a pediatric post-surgical unit setting will be described.

The interplay dynamics of the care dimensions move nurses' actions toward or away from care. Caring for children in pain has been operationalized as time from pain assessment to intervention. In this section, the interplay dynamics of influences within specific care dimensions will be identified. Therefore, influences will be identified as moving nurses' actions toward shortening, (facilitating or promoting care) or delaying (hindering or deterring nurses' actions to provide care) time from pain assessment to intervention. In the next section, the interplay among care dimensions and their influence on time from pain assessment to intervention will be evaluated.

*4.5.1 Bureaucratic dimensions*

Ray and colleagues have explored the political and economic dimensions of the Theory of Bureaucratic Caring (Ray, 1989, 1994, 1999; Ray, Turkel & Marino, 2002). Results of their inquiry suggest economics as the more dominant modality and a barrier to care, while continuing to support the reliance on all aspects of caring for the interrelationship and interconnectiveness of the human dimension of nursing care (M. A. Ray, personal communication, October 29, 2004). The political and economic dimensions require further definition for clinical practice. The legal and technological/physiological dimensions of bureaucratic caring require further definition through scientific inquiry.

#### 4.5.1.1 Political dimension

Political aspects of care describe role stratification and division of labor, power, decision making, communication patterns, regulatory and payor influences, competition and distribution of resources within an organization (Ray, 1989). Influences identified, previously described, and now categorized as fitting in the political dimension were collapsed into seven themes as listed in Table 4.13.

**Patient handoff** is one of the seven themes in the political dimension. Formal **shift report** was standardized and assured consistency in reporting administration of PRN medications for patients whose surgeries were less than four days prior to the observation. Faxed **transition reports** also provided a consistent means to communicate orders and administration of analgesics. Nurses were also able to access electronic documentation for patients transferred from the pediatric intensive care unit. These organizational communication patterns facilitated nurses' abilities to **plan** for pain management. While these reports did not seem to influence when nurses assessed patients for pain, during initial interactions with parents it became evident that nurses did use these analgesic administration reporting systems for planning care. In addition, nurses from the pediatric intensive care unit transferred the patient and therefore provided an opportunity for further updates and clarification of pain management orders and previous interventions.

The actual transition of patients to different levels of care hindered pain management. The challenge in transitioning two infants from the post-anesthesia care unit to the nursing unit was determining whether to intervene for pain or hunger. The process for transferring patients to the post-operative nursing unit required the verification of medication orders by a pharmacist, entry into both the electronic medication administration record and the automated medication dispensing system, and then availability of medications. Until orders were verified and available, nurses could not intervene for patients in pain. This role stratification and division of labor regulated by medication safety standards hindered pain management. **Analgesics' not being available is** the second political dimension theme.

In pediatrics, the healthcare rights of the patient, legal minors, are assumed by the parents. Parents and legal guardians access and secure treatment from healthcare providers for children in pain; therefore, the parents' pain perceptions, expectations, beliefs and treatment concerns influence children's pain experiences (Cusick, 2003; Huth et al, 2003; Miaskowski, 2003; Schechter, Berde, & Yaster, 2003). Yet, **parents' and grandmothers' roles** have been categorized as the third theme in the political dimension of bureaucratic caring. All but five patients had parents, guardians, or other family members with them during the entire shifts observed. Parents and grandmothers are decision makers in the care of pediatric post-surgical patients. Nurses deferred to the parents' and grandmothers' power, over nurses' own clinical judgment; and relied on this role stratification, division of labor, and political hierarchy.

Parent's either alerted nurses by calling out to request pain management interventions or alerted nurses to patients' pains while they were in patients' rooms assessing and treating patients. Nurses relied on parents to alert or confirm that a child was in pain during 15 reassessments. Nurses alerted parents to the next time an analgesic could be given and asked them to call when the patient was awake or needed the analgesic ten times during the study observations. Nurses relied on parents and grandmothers to verify their assessment of patients' pains, provide supplemental information to clarify the patients' pain assessments, especially behavioral indicators of pain, or to coach their children to assist the nurse with her assessment efforts over 40 times during the study observations, at least twice for every shift except the 5$^{th}$ shift observation. It was common for nurses to let parents decide whether or not to intervene for patients' pains. Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases, 9 nurses relied on 14 parents to make the decisions that resulted in 25 interventions. Nurses asked parents to choose when more than one analgesic was ordered; and followed through on their decision even when the nurses disagreed with the decision. Nurses relied on parent's assistance to intervene with analgesics. While parents assisted nine nurses with medication administration for nine patients, parents of the children two to seven years of age preferred not to administer analgesics. Parents of the three children under a year of age did give the analgesics to their infants. Parents provided or assisted nurses with providing biobehavioral interventions four times during the observations. As previously mentioned, parents consoled their infants. Parents also assisted in repositioning patients after orthopedic surgery.

The unit's culture was one of responsiveness to parents' requests for analgesics and decisions regarding type of analgesic. Nurses deferred to the parents, and did not assert their professional clinical judgment when their decisions differed from the parents. When asked about their pain goals, one nurse referred to the parents, "Keep them comfortable and meet parents' goal for the little ones." When asked in post-shift interviews what helped the nurses meet their pain management goals, three nurses mentioned the "Parents," more specifically "Parents who were active in plan of care," and "Listen to parents and what they say." Observations suggest that nurses were equally reliant on grandmothers.

The majority of pain assessment and management interactions with parents were with mothers. When mothers were unsure about intervening, they requested nurses' advice and supported nurses when the decision to intervene was made.

The hospital culture celebrates family centered care and parents' satisfaction. Parent's role is described in the "Pain" family education sheet. "Since a baby or young child cannot always tell us when they're hurting, parents help us better understand their child's pain" (CCHCS: Pain, May 2006). One nurse summed it up, "Just do whatever her parents want, that's what we do here, isn't it? They are really nice." Another nurse points out, "It's hard when parents aren't here." Parents and grandmothers <u>facilitated</u> caring and decreased time from alert to pain intervention.

The fourth theme in the political dimension is **letting the patient decide.** Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases, 6 nurses let 8 patients make the decision that resulted in 16 interventions. Six of these decisions were requests for analgesics or biobehavioral interventions by 9 and 16 year old males and a 15 year old female, all of whom have had previous hospitalizations and previous surgeries. The other decisions were precipitated by four routine reassessments, one patient request, and one incident of advanced planning. The youngest patient asked to decide was a six years old female.

Patients did not always decide to intervene. Four nurses, let four patients decide not to intervene on five occasions. Three of these patients reported pain of less than a four on the numbers pain scale. One nurse advised, "Don't wait until it hurts too much." In keeping with the original definition of the political dimension of bureaucratic caring, the pediatric post-surgical patients were the decision makers for these cases. Patient's reports of pain, requests for analgesics and intervention decisions <u>facilitated</u> caring and decreased time from alert to pain intervention.

Nurses were **prompted to assess** patients for pain when called for analgesics. Nurses assessed the patient in response to the calls for pain medications on six occasions, but never more than once on a patient. Travel to assess a patient to confirm the need for an intervention added 12 to 13 sec to the alert to intervention time. Initiating the process of obtaining analgesics in response to a call for intervention <u>facilitated</u> caring and decreased time from alert to pain intervention. Since parents and grandmothers' roles and letting the patient decide fit the political dimension of bureaucratic caring, deferring to these decisions to reduce intervention time is an influence consistent with this political dimension. Whereas, assessing the patients pain to confirm the request delays response time and thus <u>hinders</u> caring. Prompted to assess pain is the fifth theme of the political dimension.

Nurses who used advanced planning and pre-medicated patients for procedures also facilitated caring by obtaining assessments after delivering or providing analgesics to the patients. These **nurses' decisions** also represent the decision making power and role stratification of the political dimension and are therefore the sixth theme. Nurses decided to intervene when pain was not controlled, when the care team is unsure if or why a patient is in pain the nurse determines the cause and intervenes. Ten of the nurses made decisions to intervene when alerted to patients' pains. Nurses also planned pain management interventions and pre-medicated patients for procedures and therapies. Nurses decided when to give interventions to pre-medicate patients for procedures and treatments, such as dressing changes and physical therapy. Nurses decided to intervene and encouraged patients to take analgesics despite their resistance. Nurses' decisions promoted distraction and other biobehavioral interventions.

Nurses also made the decisions to use **leading comments** or suggestions when assessing and reassessing patients' pains. Seven nurses made twelve leading comments or suggestions. Nurses even suggested pain scores, "How's your pain now, is it gone, like a 0, or a little bit like a one or a two?" These leading comments tended toward minimizing reports of pain severity and may have hindered caring for pain by delaying or discouraging early reporting of pain and reporting of inadequacy of pain interventions.

Nurses used decision making to triage care priorities. **Triaging care priorities** delayed 9 nurses alert to intervention times in 19 cases. Care priorities took between 5 sec and 30 min and 19 sec for an average of 6 min and 18 sec. While these competing priorities may have been more urgent, they none the less delayed interventions for patients in pain and therefore hindered caring.

The final theme identified as fitting with the political dimension of caring is **consultation and teamwork.** These influences reflect role stratification, division of labor, power, decision making, communication patterns and distribution of resources. Three nurses reported that the care team helped to achieve their pain management goals. While teamwork always facilitated time to intervention, consultation did not.

To assist in making pain management decisions, nurses **consulted** other nurses and healthcare providers. **Consults** added 35 sec to 2 min and 37 sec, for an average of 65 sec. There were also unfortunately observations when patients' pains were not well controlled, yet, nurses chose not to advocate and escalate the child's pain management decisions to a charge nurse or prescriber. Two nurses did not generate consults for their patients poorly controlled pain.

Eight nurses consulted or were consulted by other nurses and healthcare providers to make pain management decisions during observations. Three of these nurses had less than three years of nursing experience and the other five had four to fifteen years of experience. Nurse's usually first consulted a nurse with more experience, their charge nurse or clinical manager. Consultations from other nurses were limited to analgesic administration and side effect management. Nurses rarely escalate pain management decisions to the prescriber or pain management team. Consultation with physician assistants, surgeons, and the pain management team usually waited until these prescribers were on the nursing unit making patient rounds. Six nurses commented in post-shift interviews that having correct analgesics ordered and available facilitated achieving their pain management goals for their patients. Lack of communication between the surgeon and physician assistants was also mentioned as a hindrance to achieving nurses' pain goals. There were six examples during four different shifts which illustrate the hindrance poor communication among the medical staff had on managing pediatric patients' post-surgical pains. This hindrance was further magnified by nurses' resistance to consult for prescribers unless they were on the unit making patient rounds. Unfortunately, nurses also bore the brunt of responsibility for these miscommunications. Perhaps this reinforced resistance to promptly consult prescribers, instead waiting to alert them to patients' pains and miscommunications when they came to the unit to make patient rounds.

4.5.1.2 Technologic/physiological dimension

The technologic/physiological dimension was merely defined as the knowledge and skill to operate and use equipment to maintain the physiological functions of the patient (Ray, 1989). This dimension of bureaucratic caring required further definition for clinical practice through scientific inquiry. Influences identified, previously described, and now categorized as fitting in the technologic/physiological dimension were collapsed into six themes as listed in Table 4.13. These themes expand the scope of this dimension from equipment to maintain physiological functions to include patient status and interventions which alter physiological functions.

**Post-operative day is** one of the six themes in the technologic/physiological dimension. Post-operative day provides a reference point of recovery from surgery, and therefore, suggests the patient's physiological status and state of pain management requirements. Of the 46 post-operative patients, 11 were admitted to the observed nurse from the post-anesthesia care unit on the day of their surgery, 14 had surgery the day before the observed shift, 4 had surgery two days before the observed shift, 7 had surgery three days before the observed shift and the final 10 patients had surgery 4 to 12 days before the observed shift. Post-surgical patients were hospitalized for 0 to 22 days for a mean of 3.26 days. Of the 16 post-surgical patients nurses discharged during their observed shift 10 were less than a day from surgery.

The number of times a patient received a pain medication during the last shift and the time of the last dose was reported during shift report on all except six post-surgical patients. All but one of these six patients had surgery at least four days prior to these shift reports. This suggests that patients may no longer be routinely receiving PRN analgesics this long after surgery. In fact all but 7 of the 46 post-surgical patients had analgesics ordered. Four of the patients without analgesic orders were 5 to 12 days out from surgery. One nurse mentioned "I wish they would put everyone on something scheduled at least for the first day after surgery." Another nurse noted the influence of time from surgery, specifically that her patients were, “Couple days post-op, so easier to manage pain.” These findings suggest that post-operative day hinders pain management, the greater the length of time since surgery, the lower the priority to intervene for pain.

**The numbers pain scale is** second of the six themes in the technologic/physiological dimension. In keeping with Ray’s (1989) original definition of this dimension, the appropriate use of pain assessment tools to optimize pain control and monitor the patient’s response to analgesics fits the technologic/physiological dimension of care. While the number’s pain scale is subjective, it is used as a measure of patients’ physical pain, both before and after interventions.

Although there were 23 post-surgical patients over 7 years of age during the study observations, the numbers pain scale was only used to assess and reassess 13 post-surgical patients’ pains by ten nurses. These patients were 11 to 16 years old. Only two nurses explained the anchors of the number pain scale on one occasion each, so there is evidence that the number’s pain scale was not appropriately used to optimize pain control and monitor the patients’ responses to analgesics.

Twelve interventions were provided by seven nurses following the assessment of eight patients with the numbers pain scale. These pain scores ranged from zero to nine with a mean of six. A nurse intervened for one patient each who provided ratings of zero and one; and another nurse intervened for a patient who reported a pain level of four. The other nine times patients received interventions, their ratings were between five and nine with a mean rating of 7.4. These results suggest that the higher the pain rating on the numbers pain scale the more likely the nurse is to intervene, thus facilitating pain management.

Interventions did not follow 11 uses of the numbers pain scale by 9 nurses to assess or reassess 10 patients for pain. These pain scores ranged from 0 to 8 with a mean of 3.2. Only two of these patients reported a pain level of zero. Some nurses used discrete numbers on the scale to guide their interventions, “Our pain team tells us that a 4 is comfortable.” This may hinder pain management. Pain scores did not always indicate that the patient was comfortable. One patient each reported a pain level of five, six, and eight, but no interventions were provided to these patients.

The numbers pain scale provides a subjective means to communicate pain distress. Another way children communicate distress and the third technologic/physiological dimension theme is **behavior**, including **crying**. This theme also expands the scope of this dimension to include patient status and physiological responses to distress.

The nurses were observed being alerted to the pain of five post-surgical patients under a year of age. Four of these patients were crying. Nurses were also alerted to the sound of crying from outside patients' rooms. Nurses intervened for ten post-surgical patients whose initial assessments alerted the nurse to the patient's pain. Seven of these patients were crying during the initial assessment. Crying was actually the assessment for 12 of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases**.** Crying patients were between two weeks and six years old. At times nurses asked parents and grandmothers to clarify the meaning of the patients' cries before intervening.

Additional assessed behaviors that led nurses to intervene for pain were whining, kicking, and screaming. Nurses relied on parents and grandmothers to supplement their assessment of patient's behavioral indicators of pain. Behavioral manifestations of distress, especially crying, facilitated alerting nurses' to patients distress, but did not increase their responsiveness. Alert to intervention time for patients who were crying or displaying other pain behaviors ranged from 0 to 43 minutes and 34 sec, with a mean of 10 minutes and 23 sec.

The fourth theme used to characterize the technologic/physiological dimension includes potential physiological changes the patient may experience which alert nurses for the need to use **advanced planning** to prevent distress from these contributing factors and procedures. To be effective nurses also had to understand and anticipate physiologic responses to analgesic and biobehavioral interventions. These **interventions and their potential side effects** are the fifth theme in the technologic/physiological dimension.

Movement, anxiety, hunger, and other factors appeared to **contribute** to patients' pains and complicate nurses' ability to obtain an accurate assessment. Contributing factors complicated 28 assessments of 18 patients by 10 different nurses. Nurses intervened 11 times; with pharmacologic interventions 7 times, repositioning once, and both pharmacologic and biobehavioral interventions 3 times. Movement was the most common contributing factor aggravating pain after orthopedic and abdominal surgeries. Pain and anxiety over moving became a vicious cycle. Some contributing factors are more difficult to identify, hindering nurses' pain management efforts.

Ten nurses **pre-medicated** twelve of their patients for potential pain from dressing changes, sitting, walking, and physical therapy. The most common reason nurses gave for pre-medicating patients for pain was to get them up and walking whether that was with a nurse or prior to physical therapy. Pre-medicating was meant to facilitate caring. Three nurses pre-medicated three patients for four dressing changes. One nurse, however, gave Lortab immediately before the dressing change. The patient cries when given Lortab and throughout the dressing and diaper change. The patient stops crying when the dressing change is complete. This nurse failed to wait for the onset of action of the analgesic which would have required more advanced planning.

Six nurses used **advanced planning** twelve times to prevent pain for eight of their patient's pain, rather than reacting to a pain assessment. Nurses planned and provided one to three doses of analgesics for each of these eight patients, facilitating caring. Nurses either merely gave the medications when the time interval between doses had elapsed or informed the parents they could ask for the analgesic. Only one nurse actually delayed medicating the patient for pain twice to keep the patient on the PRN intervals.

In order for pre-medicating and advanced planning to be effective for preventing pain, nurses must be able to negotiate **interventions' actions and their potential side effects**. As previously mentioned, these are included in the fifth theme of the technologic/physiological dimension. Nine influences were identified in the study. Those that facilitated caring were: pain management orders, scheduled and PRN analgesics, and biobehavioral interventions. Those that hindered caring were acetaminophen limit or potential acetaminophen overdose, transition pain management, analgesic side effect management, and biobehavioral interventions. Reliance on pain technologies, transition from intravenous to oral analgesics, and getting patients off opioids were also subthemes; but there was either not enough evidence to determine the interplay of the care dimension or the effect of these influences were patient specific.

Pediatric Registered Nurses intervened with analgesics 43 times and biobehavioral interventions 15 times. Of the 46 post-surgical patients all but 7 had **analgesics ordered**. Having analgesics ordered <u>facilitated</u> caring. Hydrocodone was given to 18 patients, which made it the most common PRN analgesic given. All but two patients weighing less than 50 kg were within the recommended dosage range (American Pain Society, 2009). Hydrocodone products used also contain acetaminophen, patients over 50 kg received the recommended the acetaminophen dosage, but only two patients weighing less than 50 kg were within the dosage range. In order to facilitate caring by providing analgesic within both the hydrocodone and acetaminophen in recommended starting dose ranges, patients weighing less than 50 kg must be prescribed at least 0.15 mg/kg of hydrocodone as recommended on the pre-printed order forms. Codeine was given to five patients. Again, while the codeine dosages were within the recommended starting dose range, only one patient weighing over 50 kg and one patient weighing less than 50 kg received acetaminophen dose within the recommended dose.

Use of schedule analgesics resulted in 11 cases of pain intervention. Eleven of the post-operative patients had **scheduled and PRN analgesics** ordered. Toradol was the scheduled analgesic for nine of these patients. The other two patients had both scheduled ibuprofen and acetaminophen. Nurses assessed for pain and provided a scheduled analgesic, like ketorolac or ibuprofen zero to three times per shift. Throughout the study, the researcher observed the administration of scheduled analgesics by seven nurses to eight different patents. Only one nurse gave the scheduled Toradol and a PRN oral analgesic at the same time. Most nurses waited and reassessed after giving scheduled analgesics to see if PRN analgesics were needed, while this may have hindered prompt pain management, the availability of scheduled and PRN analgesics facilitated nurses ability to provide care.

Pediatric Registered Nurses intervened with a variety of **biobehavioral interventions:** swaddling, pacifier, consoling, repositioning, heating pads, and distraction. All of the patients who were repositioned had orthopedic surgeries. All but three patients who received biobehavioral interventions also received analgesics. The three patients who did not receive analgesics were younger. Biobehavioral interventions were usually given when it was not time for the next dose of an analgesic. Nurses relied on parent's assistance for providing biobehavioral interventions. Parents provided or assisted nurses with providing biobehavioral interventions four times during the observations. As previously mentioned parents consoled their infants. Parent's also assisted in repositioning patients after orthopedic surgery.

Alert to intervention time for patients who received biobehavioral interventions ranged from 0 to 22 minutes and 42 sec, with a mean of 5 minutes and 51 sec. The quickness of these responses, suggest that biobehavioral interventions facilitate caring. However, all but three patients who received biobehavioral interventions also received analgesics. The three patients who did not receive analgesics were younger. Biobehavioral interventions were usually given when it was not time for the next dose of an analgesic. In addition, repositioning seemed to aggravate orthopedic patients' pains rather than relieve them.

The daily maximum of **acetaminophen** and the potential for acetaminophen overdose were issues that presented to 11 of the 14 nurses observed. Six post-operative patients had both acetaminophen and another combination acetaminophen analgesic ordered PRN. One nurse resorted to biobehavioral interventions when an infant had pain just two hours after receiving a dose of acetaminophen. The patient also had acetaminophen with codeine ordered, but the nurse and the co-signing nurse concluded that the patient could not have another acetaminophen containing analgesic within four hours of a previous dose. This hindered the patient's pain management. Nurses tried to warn parents of this challenge when asking them to decide between two analgesics, both containing acetaminophen. A physician assistant also called to change the frequency of ordered hydrocodone/acetaminophen from every 4 hours to every 6 hours to decrease a patient's daily acetaminophen limit.

Nine nurses discharged thirteen patients on analgesics containing acetaminophen. Printed skin incision instructions contain directions regarding limiting the use of Tylenol when patients are prescribed acetaminophen containing analgesics. Some patients were discharged without instructions to limit acetaminophen. Three nurses merely recommend Motrin.

**Transition of pain management** also hindered caring. A nurse is challenged to determine an appropriate hydrocodone dose for an 89 kg patient. The nurse and physician assistant fail to realize the equianalgesic dose hydrocodone as compared to the IV morphine the patient is requiring to reduce her pain. The physician assistant later calls the nurse back and asks her to write a clarification order to change the Lortab dose to every six hours instead of every four hours. He is concerned that providing this dose every four hours will exceed the patient's daily acetaminophen limit.

Analgesic side effects and the potential for **analgesic side effects** influenced the decisions of 9 nurses care of 22 patients. Analgesic side effects included: nausea, sedation, dysphoria, hypnogotic myoclonus, orthostatic hypotension, fall, pruritis, respiratory depression, and constipation. The most common side effect all 9 of these nurses negotiated was nausea and the potential for nausea for 17 of these patients. Efforts to prevent nausea hindered care. The medication administration record had a note "take with food to avoid GI upset" for all ordered oral opioid containing analgesic. Six of the seven nurses with over three years of experience required patients to eat prior to administering an oral opioid containing analgesic. Experienced nurses even delayed analgesic administration until patients had eaten, delaying time to pain intervention. Only four patients actually reported nausea during the shift observed. No patients vomited during observations.

One parent reports resistance to give an analgesic because of her daughter's dysphoria with a different analgesic during her previous hospitalization. A nurse decides to trial a patient off of morphine due to the patient's experience of hypnogotic myoclonus. Nurses also consulted to differentiate pruritis from an allergic reaction and investigated the potential prescription of an alternative analgesic to prevent either reaction. Care was not hindered due to these concerns or efforts to address these side effects.

Nurses used a **pain technology,** like PCA, to manage the patients' pains zero to twice in a shift. A patient with a PCA was involved in 2 cases of PRN pain intervention. The same nurse gave a bolus when the patient was unable to get a patient controlled dose and then later coached the patient in distraction until the patient could again activate the PCA. Nurses reliance on PCA and pain technologies were not fully explored in this study.

Nurses negotiated **transition to other methods of managing pain**, specifically the transition off of pain technologies. During study observations nurses cared for four patients with epidural analgesia and four patients with patient controlled analgesia (PCA). Patients were not transitioned off the PCA during the shift observations, but two patients cared for by the same nurse were transitioned off their epidural analgesia. One patient's transition was smooth resulting in minimal pain. The other patient's transition from epidural analgesia was more complicated. The observed nurse provided an analgesic as soon as it was ordered for this patient.

Nurses tried to transition patients from **intravenous to oral analgesics** to prepare for discharge home (18 post-operative patients). If more than one opioid was ordered, one was usually ordered by the IV route and the other the oral route. Seven post-surgical patients had IV morphine and another oral opioid analgesic ordered PRN pain. Although nurses did not express concern about **getting patient's off opioids**, they did try to move patients from the IV to the oral route.

The sixth and final theme used to characterize the technologic/physiological dimension is the **rate IV push** medications are administered. IV opioid analgesics were given over 98 to 974 sec for a mean nursing time of 451 sec. Some nurses first diluted the opioid analgesics in the medication room. Nurses then either gave the analgesic by slow and steady push, by intermittent push, or by syringe pump. Inconsistency, may have led one patient to give the concerning request, "push it at hand." Variance in IV push techniques also may have led to one patient's "light-headedness," another patient's feeling "loopy, " and another patient's complaint of chest tightness.

4.5.1.3 Economic dimension

The economic dimension of bureaucratic care emphasizes workload, staffing, and patient acuity. Economic aspects of care involve the allocation of resources to provide care while maintaining the viability of the system. As previously mentioned, Ray and colleagues have explored the political and economic dimensions of the Theory of Bureaucratic Caring (Ray, 1989, 1994, 1999; Ray, Turkel & Marino, 2002). Results of their inquiry suggest economics as the more dominant modality and a barrier to care. The economic dimension requires further definition for clinical practice.

Workload and staffing determine direct care time and therefore influence the cost of care. There was little variance in staffing and direct care time during the 14 shift observations. Influences that pull nurses away from direct patient care, however, influence nurses' responsiveness to children's acute postoperative pain. Changes in staffing, delegation, and processes may decrease nurses' time away from patients and the economic dimension. Three themes were identified, all <u>hindered</u> prompt alert to intervention intervals.

**Interruptions and delays** between pain alert and intervention is the first theme of the economic dimension.  Four nurses were interrupted six times between being alerted to their patients' pains and intervening. The shortest interruption was 21 sec while a care partner and clinical manager moved a patient bed in hall. This prevented the nurse from getting to the patient with an intervention. The longest interruption was 2 minutes and 3 sec to answer a phone call. The average interruption added 35 sec to these alert to intervention times.

Nurses were delayed from 59 sec to 37 minutes and 49 sec for an average delay of 6 minutes and 10 sec.  Six nurses were delayed nine times. The longest delay was the result of a patient leaving he unit with his Aunt without notifying his nurse.  Nurses needed to re-document the medication administration times in the automated dispensing system and electronic medication administration record when the patient returned and was ready for analgesic administration. Two delays were related to waiting in line for the medication room computer and the automated dispensing system. Two delays were the result of looking for patient stickers to label medications. Four other delays were related to the computer system, including two password problems, a nurse leaving before completing the co-sign procedure of the automated dispensing system, and having to wait for pharmacy to add a patient and verify his medications in the computer system.

The second economic dimension theme relates to **time to travel** to the centralized medication room **to retrieve analgesics**. Travel times ranged from 6 to 80 sec for a mean of 34 sec. Differences in travel times reflect distance from the patient room and the medication room. While these times may seem short, of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases, pediatric Registered Nurses intervened with analgesics 43 times.

The third theme categorized in the economic dimension is the **gathering of liquids and foods** to facilitate patients taking oral analgesics. This time delay includes gather cups and straws from the kitchen. Travel times ranged from 22 to 342 sec for a mean of 94 sec.

Differences in travel times reflect distance from the patient room and the kitchen as well as the time to retrieve items from the kitchen. Nurses retrieved liquids and foods to facilitate patients taking oral analgesics 14 times during the study.

#### 4.5.1.4 Legal dimension

Ray identified legal aspects of care as responsibility, accountability, liability, rights, rules and guiding principles of behavior (1989). Legal aspects as defined by the literature review may include prescriptive authority and limitations, accountability for opioid administration, and the potential liability for inadequate resolution of pain. Two themes were identified as fitting the legal dimension of the Bureaucracy of caring. Both <u>hindered</u> caring

The first theme is witnessing or co-signing. Consider the burden of witnessing and dispensing controlled substances, as well as concerns regarding drug diversion. Of the 43 PRN analgesic interventions, 40 required a legal witness or co-sign to verify the amount given and the amount wasted to prevent controlled substance diversion by nurses. Witnessing took 10 to 357 sec for a mean of 122 sec, just over 2 minutes. Nurses only had to call for a witness more than once three times during three different shift observations. The nurses waited 70 to 79 sec before recalling for a co-signature. Nurses were required by policy to **witness** (co-sign) the removal and discard of controlled substances in the electronic medication administration record and the automated medication dispensing machine. The use of two systems required duplication of documentation efforts with delayed medication administration, and hindered care.

The second theme was a lack of analgesic orders, either because they were not ordered or the ordered interval between analgesic doses had not been reached. Seven post-surgical patients did not have analgesics ordered. Infants, whose ventricular-peritoneal shunts were externalized two, three and four days prior to observation, did not have analgesics ordered. The other four patient's surgeries were 5 to 12 days prior to the observation. Nurses were only alerted to one of these patients' pains twelve days after spinal fusion. As previously discussed two nurses delayed medication administration 30 to 40 minutes until the next dose was due.

One nurse consulted a prescriber when a patient was in pain and all ordered options had been exhausted. Another nurse did not intervene twice because analgesics were not due. She did not intervene later either, when the ordered interval had been surpassed.

*4.5.2 Humanistic dimensions*

While continuing to support the reliance on all aspects of caring for the interrelationship and interconnectiveness of the human dimension of nursing care, researchers have not explored the humanistic dimensions of care (M. A. Ray, personal communication, October 29, 2004). The spiritual/religious, social/cultural, and educational dimensions of bureaucratic caring require further definition and description.

4.5.2.1 Spiritual/religious dimension

Spiritual/religious aspects of care describe acts of faith, empowerment, creativity, choice, hope, and "brotherly love." Spiritual/religious aspects of pediatric pain management may include hope for complete pain relief. Ray's definition of this dimension also suggests that assurance, empathy, and brotherly love in preventing the pain of another are spiritual/religious aspects of care. Nurses' goals for pain reduction or relief were the only theme categorized in the spiritual/religious dimension. Nurses' goals hindered caring.

Only one nurse's goal was to make sure her patients were pain free. She did not have any patients in pain during her shift. All other nurses' goals were consistent with the hospital's "Pain" education sheet which clarifies, "while all pain cannot be stopped, almost all pain can be reduced (CCHCS: Pain, May 2006)." The hospital's pain policy states, "Goals will be set according to the patients and family's background, expectations, and culture (CCMC: Policy PS 153, January 2009). Goal setting with patients or families was not observed, but nurses did express the goal of meeting the patients and parents expectations.

Nurses used the words comfortable, tolerable, controlled and manageable when stating their pain goals. Three nurses gave the numerical goal of under a three, but one nurse also gave her second patient a goal of less than a four; and a third nurse gave a goal of less than a five. Nurses also stressed functional goals, such as encourage oral intake, ADLs and walking.

All nurses thought their pain goals had been met, mostly met or partially met. Two nurses listed their pain goals according to the individual patients assigned to their care. All other nurses provided more global responses. She stated her goal was achieved. Other nurses' pain goals and their impression of their success in achieving those goals are listed in Table 4.6.

The numbers pain scale was used to assess and reassess 13 post-surgical patients' pains by ten nurses. These patients were eleven to sixteen years old. Three post-surgical patients gave pain scores of zero and six stated they did not have pain, suggesting that patient's experiences safely exceeded nurses' pain management goals.

4.5.2.2 Social/cultural dimension

Social aspects of care include communication, compassion, concern, involvement, intimacy, love and empathy in caring. Respect and trust in providing care involves adhering to culturally defined standards of moral behavior. Social/cultural aspects include empowering the child to articulate his/her pain and pain relief experience. Expectation of pain and pain management are explored in the social/cultural dimension. The effectiveness of initial pain management interventions implemented during a nurse's shift and even nurse's efforts caring for the same patient during previous shifts influence the type and timing of subsequent assessments and interventions. Six themes were identified as being consistent with the social/cultural dimension of the Bureaucracy of Caring.

The first theme of the social/cultural dimension is **patient age**. Patients ranged in age from 2 weeks to 24 years with a mean of 8.9 years. There were 19 post-surgical patients less than 3 years of age. There were only 4 post-surgical patients between 3 and 7 years of age, but 23 post-surgical patients were over 7 years of age. Therefore the majority of post-surgical patients should be able to self-report their pain using standardized and validated pain scales. Reports from the patients were the most common pain assessment technique used by every nurse and observed 47 times with 21 patients between 2 and 17 years of age. Whereas, the numbers pain scale was only used to assess and reassess 13 post-surgical patients' pains by 10 nurses. These patients were eleven to sixteen years old. Crying was the assessment that led to 12 of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases**.** Crying patients were between two weeks and six years old. Nurses relied on parents and grandmother's to supplement their assessment of both patients' self-reports of pain and patient's behavioral indicators of pain.

Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases, 6 nurses let 8 patients make the decision that resulted in 16 interventions. Six of these decisions were requests for analgesics or biobehavioral interventions by 9 and 16 year old males and a 15 year old female, all of whom have had previous hospitalizations and previous surgeries. The youngest patient asked to decide was a six years old female.

Nurse relied on parent's assistance to intervene with analgesics. While parents assisted nine nurses with medication administration for nine patients, parents of the children two to seven years of age preferred not to administer the analgesic. Parents of the three children under a year of age did give the analgesic to their infants.

These examples suggest that age influences caring, but no generalities can be made about the direction of the influence. Use of the numbers pain scale, for example, was not more efficient than simple self-report or request for analgesia. Crying, on the other hand, was a very efficient method of alerting nurses to pain and securing prompt parental biobehavioral responses.

**Communicating pain expectations** is the second theme of the social/cultural dimension. Nurses used these **face to face** interactions after formal shift reports to discuss inconsistency with their **expectations of patients' pain** behaviors, patients and family members' pain management expectations, and pain management orders. Seven nurses **c**ommunicated their pain expectations regarding ten patients to patients, parents and the researcher. Four of these patients had pain that was challenging to control. To the patients and parents, the nurses communicated that complete pain relief was an unrealistic expectation. Six of the nurses received information in report regarding patients and family members' pain management expectations as well as inconsistencies with nurses' expectations of patients' pain behaviors and **concerning patient behaviors**. Nurses considered patient's specific requests regarding how to administer intravenous medications concerning. Nurses negotiated these discrepancies with expectations to make intervention decisions for patients. Finally nurses expressed their expectations of interventions and patient's pain control goals.

These communications typically deterred caring and delayed intervention responsiveness. These patients became labeled as having a low pain tolerance or were subjected to unique rules, like "Mom said, don't tell him he can have the Dilaudid 'cause he will ask for it all the time."

The third theme in the social/cultural dimension reflects social norms for the **timing of pain assessments.** Report from previous shift did not seem to influence when nurses assessed patients for pain. Five of the fourteen nurses performed their **initial patient assessments** by room number order. Most nurses completed their initial patient assessments by 8 o'clock. Three nurses did not begin their initial patient assessment until after 8 o'clock. Five patients were in pain when initially assessed or before assessed by one of the 11 nurses who assessed patients early. Whereas, four of the patients cared for by one of the three nurses who started their initial assessments after 8 o'clock were in pain at or before the time of the assessment. Late pain assessment seems to hinder caring.

Nurses assessed patients in response to the calls for pain medications on six occasions, but never more than once on a patient. Two of these assessments were also the nurses' initial assessments of the patient. Social/cultural norms seem to dictate that you assess a patient for their first request for analgesics, but not for subsequent requests. By retrieving the analgesic before assessing the patient, the time from alert to intervention is actually shortened and thus eliminating or delaying this assessment until analgesic delivery <u>facilitated</u> caring.

The manner in which nurse are **alerted to patients' pains** in the fourth theme in the social/cultural dimension of the bureaucracy of caring. There are four different social/cultural ways nurses are alerted to patients' pains: during initial pain assessment, reassessments, requests for pain medications, and patient's reports. Nurses intervened for ten post-surgical patients whose **initial assessments** alerted the nurse to the patient's pain. Seven of these patients were crying during the initial assessment. **Reassessments** of 15 patients alerted 8 nurses to patients' pain 23 times. Nurses relied on parents to alert or confirm that a child was in pain during 15 reassessments. Ten of the nurses were alerted to 14 patients' pains by call **requests for analgesics** 18 times. Nurses were also alerted to patients' pains by requests for analgesics while they were in the patients room assessing and treating patients. Five nurses were alerted to 6 patients' pains in this manner 11 times. Two of these patients had also called for pain medicine at least once when the nurse was not in the room. Of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention **cases**, pediatric Registered Nurses were alerted to patients post-operative pain during routine initial assessments (10 cases) and reassessments (15 cases), requests for analgesics or biobehavioral interventions, i.e. heating pads, when the nurse was not in the patient room (12 cases) and when the nurse was in the room (5 cases).

**Reports from the patients** were the most common pain assessment technique. This technique was used by every nurse and observed 47 times with 21 patients between two and seventeen years of age. However, this was exclusively the only pain assessment technique used prior to interventions in just four cases. Five additional post-surgical patients between nine and sixteen years of age reported "it hurts," "it hurts really bad," or nodded when asked if they were hurting before being more thoroughly assessed with a standardized pain scale and then receiving interventions.

Social aspects of care includes communication, compassion, and concern, Social/cultural aspects include empowering the child to articulate his/her pain and pain relief experience. These four different social/cultural ways nurses are alerted to patients' pains <u>facilitate</u> caring, by essentially starting the caring cascade of actions.

The fifth theme <u>hinders</u> caring. This is the social/cultural theme of **broken promises**. Four nurses broke their promises to intervene for four patients' pains. Respect and trust in providing care involves adhering to culturally defined standards of moral behavior. Therefore, breaking promises to intervene for pediatric patients' pains hinders caring.

The sixth and final social/cultural theme involves the social skills of **negotiating.** Pediatric nurses negotiated giving oral analgesics to infants and children, getting the analgesics in the patients, coaching and rewarding the patient for allowing pain relief interventions. Ten different nurses **negotiated the administration** of analgesics with 17 patients and their parents. Nurse relied on parent's assistance to intervene with analgesics. While parents assisted nine nurses with medication administration for nine patients, parents of the children two to seven years of age preferred not to administer the analgesic. Parents of the three children under a year of age did give the analgesic to their infants. Much of the negotiation focused on masking the taste of the analgesics. Many patients were **resistant to take oral analgesics**. As previously discussed, nurses tried to disguise the taste. Patients who could swallow pills usually did so in five sec, whereas children who were **resistant to take oral analgesics** added 5 to 460 sec to the alert to intervention interval. Two nurses **rewarded** two patients for taking their oral analgesics, one with a popsicle the other with a gift basket. Nurses also coached patients in the use of biobehavioral interventions. All of these efforts added time to the alert to intervention interval, thus they <u>hindered</u> caring. Although the alternative may be true, if these efforts were ineffective, the patients would not benefit from the interventions they didn't swallow.

4.5.2.3 Educational dimension

Educational aspects of care describe educational programs, information and teaching. Educational aspects of acute pediatric pain management requires an understanding and ability to educate others regarding appropriate knowledge and attitudes to achieve pain control, such as resolving concerns about analgesics or the need to be strong in times of adversity. Knowledge of patients, families, nurses, and clinicians should reflect the state of the science and the art of caring. The literature suggests that nurses who are better educated, with more clinical experience, or have had personal experience with pain are more skilled in making optimal pain management decisions for their pediatric patients. Results of the influence of nurses' characteristics on nurses' pain assessment and management decisions, however, are inconsistent across studies and only one pattern was gleaned from this study.

Although one nurse thought her 11 years of nursing experience helped her achieve her pain management goal. Nursing experience in this study <u>hindered</u> caring. Nursing knowledge and experience is the first of three educational themes.

The nurses observed had 2 to 15 years of nursing experience with a mean of 5.8 years of experience. Six of the seven nurses with over three years of experience and one of the nurses with less than three years of experience required patients to eat prior to administering an oral opioid containing analgesic. Experienced nurses even delayed analgesic administration until patients had eaten. This finding suggests that nurses' years of experience influence their analgesic side effect management.

This was also the most common knowledge deficit. Nurses did not understand the mechanism of nausea and the potential for nausea from opioids. The medication administration record had a note "take with food to avoid GI upset" for all ordered oral opioid containing analgesic. Nausea from opioids, however, is related to their central mechanism of action, not a local effect. Nausea from opioids are the result of their binding to receptors located in the fourth ventricle of the brain (Pasero, Portenoy and McCaffery, 1999). There is no evidence that taking food with oral opioids will “avoid GI upset.” Opioid-related nausea and vomiting, whether from oral or intravenous formulations, should be treated with centrally acting antiemetics, like Ondansetron (Zofran) (American Pain Society, 1999).

Additional knowledge deficits were rare, but eight were overheard and observed during five shifts. Three were related to analgesic dosing, three others were unique. Nurses, physician assistants, and pharmacists had analgesic knowledge deficits. All knowledge deficits hindered pain management.

When provided with knowledge regarding procedural pain management, a nurse followed the researcher’s advice and was impressed by the results, obtaining intravenous access with one painless (according to the patient) attempt. The nurse immediately shared this new knowledge with other clinicians.

**Patients’ previous pain** experiences also hindered pain management. Patients previous pain experiences is the second theme related to the educational dimension. Patients’ previous pain experiences may have influenced decisions to intervene. The previous pain experiences of 16 patients were shared with the 9 nurses caring for these patients. Previous pain experiences focused on the pain and pain relief of previous surgeries, as well as the pain relief or lack of pain relief with previous analgesics and analgesic doses. Nurses shared past experiences with patients and patients shared past experiences with pain. Patient’s previous experience with analgesics influenced future analgesic decisions. Previous experiences provided information regarding amount of analgesic required to relieve the patients’ pains and how often the analgesics are needed. Yet, patients who had previous experiences with pain tended to have poorly controlled pain.

For example, the 15 year old patient’s pain after laparoscopic cholecystectomy is not as well controlled as it had been after her appendicovesicostomy surgery or her posterior spinal fusion. The patient’s mother comments, "Usually they give her something scheduled and Morphine on top, this is worse than her belly surgery." The patient’s mother explains she is aware of the pain after this surgery, since she personally had this surgery 15 years ago. The patient shares her experience with another surgery, she had the "Q-ball for APV surgery and numbed it."

The third and final theme categorized to the educational dimension facilitated pain management. Nurses **advise patients to avoid severe pain** and **educate patients** about pain and pain management when prompted. Three different nurses and one surgeon advised patients, parents, and a grandmother to avoid severe pain. Nurses educated parents and mothers about analgesic effects, specifically onset and duration of analgesic action, as well as, side effects. Nurses provided additional analgesic education upon discharge.

A formal institutional "Pain" education sheet was available for families and provided on admission. It defines pain and specifies the three scales used to measure pain (CCHCS: Pain, May 2006). This education sheet also clarified, "while all pain cannot be stopped, almost all pain can be reduced."

## 4.6 Interplay of Care Dimensions

Aim #4: Evaluate the interplay of care dimensions and their influence on time of pain assessment to intervention.

Nurses' goals for pain management were consistent with the organization's goals. Nurses desired for their patients to be as comfortable as possible, pain managed, and tolerable. For the majority of patients, these goals were achieved. Five patients even exceeded this goal by reporting they had no pain after surgery on the day of observation (See Table 4.14). In contrast, this goal was not achieved for 6 patients.

Table 4.14: Patients with No Pain Versus Patients Whose Pain was Challenging

| No pain after surgery on day of observation: | Pain was challenging and not controlled: |
|---|---|
| 1) 11 year old white male 1 day after insitu pinning of right hip<br>2) 6 year old white female 1 day after extravesical ureteral reimplant,<br>3) 15 year old white male 3 days after pectus carnitum repair<br>4) 8 year old Hispanic male 5 days after left thoracotomy and repair of paraesophegeal diaphragmatic hernia,<br>5) 14 year old black male 7 days after laparotomy for small bowel obstruction. | 1) 6 year old white female 1 day after open reduction and internal fixation of her left elbow.<br>2) 6 year old white male 1 day after surgery for Chiari malformation,<br>3) 15 year old white female 1 day after laparoscopic cholecystectomy,<br>4) 16 year old white female 1 day after total thyroidectomy,<br>5) 9 year old white male patient 3 days after excision physeal bar right femur,<br>6) 16 year old white female 4 days after arthroscopy of her right knee with synovial debridement and lateral release |

Consistent themes and care dimensions relevant to the patients who reported minimal or no pain were:

- No shift report of PRN analgesic administration during the previous night shift (political dimension)
- Reports of no pain on initial assessment or pain that was not significant enough to alert the nurse to intervene (social/cultural dimension).

These patients' nurses facilitated care by:

- Pre-medicating patients for known contributing factors like movement; using advanced planning to schedule the administration of even PRN analgesics and giving analgesics when the time interval between dosing had elapsed; transitioning patient to other methods of managing pain; addressing potential analgesic side effects like nausea, light-headedness, and constipation (technologic/physiological dimension).

- Asking parents to interpret pain behaviors to decide whether or not to intervene and relying on the parent's assistance to administer medications (political dimension).
- Advising patients to avoid severe pain (educational dimension).

These nurses also made leading comments (political dimension) and communicated their expectations for pain (social/cultural dimension) but so did nurses who cared for patients whose pain was not controlled.

In contrast, consistent themes relevant to the patients whose pain was challenging and not controlled were:

- Patients had previous experiences with pain from hospitalization and surgery or analgesic side effects (educational dimension).
- Patients' experienced pains beyond the patients' expectations and the expectations communicated by the nurses (social/cultural dimension)
- Nurses were alerted by parents' requests or calls (political & social/cultural dimensions).
- Crying was a behavioral indication of pain for children six to nine years of age (technologic/physiological dimension); and
- Children over 15 years of age reported pain of seven or eight out of ten, that remained greater than a four or five on reassessment after interventions (technologic/physiological dimension).
- Movement and anxiety were contributing factors (technologic/physiological dimension).
- Poor communication among the medical staff (political dimension).

These patients' nurses hindered care by:

- Deferring analgesic decisions to patients less than nine year old and their parents, who were uncertain about the appropriateness of interventions (political dimension).

- Using biobehavioral interventions (repositioning, breathing, distraction) when the next analgesic dose was not yet due (technologic/physiological dimension).
- Waiting until prescriber's made patient care rounds to alert them of patients continued pain, failure to rescue (political dimension).

However, there were commonalities too. These nurses had the same goal of managed, controlled, and tolerable pain (spiritual/religious dimension). Nurses negotiated **transition** to other methods of managing pain, specifically the transition off of pain technologies (technologic/physiological dimension). During study observations, two patients cared for by the same nurse were transitioned off their epidural analgesia. The transition of a **15 year old** male **three post-operative days since** pectus carnitum repair went smoothly (social/cultural & technologic/physiological dimensions). The transition of a **9 year old** white male patient **3 days after** excision physeal bar right femur was more challenging (social/cultural & technologic/physiological dimensions). These patient experiences provide a means to describe the interplay of care dimensions and their influence on time of pain assessment to intervention. Details for the nine other cases of optimal or challenging pain management are detailed in appendix E.

*4.6.1 Case of optimal pain management*

This **15 years old** white male had an epidural catheter for pain control (social/cultural & technologic/physiological dimensions). There was **no observable pain assessment** as part of the nurse's **initial assessment** (social/cultural dimension). The nurse physically assessed this patient, went over his **plan of care**, including his pain management transition off the epidural catheter, but never asked about his pain (educational dimension).

His nurse had stopped his epidural at 08:00 and given Lortab 7.5 mg orally 30 minute later as ordered. **She** then **medicated** the patient with the same dose of Lortab every 4 hours and 20 minutes to 4 hours and 30 minute to keep the patient's pain to a minimum (political & technologic/physiological dimensions). During reassessment after the first dose of Lortab, "On a scale of 0 to 10, with 0 being no pain, how much pain are you having?" The patient answers, "Like a **2** (technologic/physiological dimension)." The nurse clarifies, "A 2? I turned off your epidural while you were sleeping. I know that's mean." The nurse **communicated her pain expectations** (social/cultural dimension). "**You will have some tenderness**, soreness, but **our goal is to keep you as pain-free as possible** (spiritual/religious dimensions). You also have some IV medicine, so **tell me** if this isn't working (political dimension). We want you to **move and walk** that will keep you from getting stiff and sore (social/cultural & technologic/physiological dimensions)."

This nurse used **advanced planning** to prevent pain, rather than reacting to a pain assessment (technologic/physiological dimension). Nurses used advanced planning to schedule the administration of even PRN analgesics, "**I thought** I would give you your pain med, are you hurting at all? (political dimension)." The patient responded, "No." The nurse further probed, "On a scale of 0 to 10, 0 being no pain, 10 the worst ever?" The patient replied, "**0** (technologic/physiological dimension)." The patient's **dad** asked, "You're not hurting at all (political dimension)?" The patient confirmed, "No." The nurse explained her decision, "Well let's give you this pain med. It's the same as what I gave you this morning so we can **keep the pain controlled** (technologic/physiological & spiritual/religious dimensions)."

Later, the **surgeon asks** if the patient's pain medicine is scheduled overnight, he explains, "No, lets free him up and I will schedule his med **every six hours** (political & technologic/physiological dimensions)." The **nurse clarifies the schedule** in an effort to advocate for the patient, "Every six or every four (political dimension)?" The surgeon asks, "Is it every six now?" The nurse answers, "No, it is every four." The surgeon clarifies the dose, "7.5 mg?" The nurse affirms, "Yes." The surgeon restates the plan, "Will schedule it every and then PRN when he goes home" The **nurse begins the new order** at 17:47:46 (political & technologic/physiological dimensions). "Here is your pain med, what is your pain? On a scale of

0 to 10?" The patient replies, “Uh, **1** (technologic/physiological dimensions)." The patient had received his previous dose for a pain score of 0 at 13:27:12.

The surgeon advised to **avoid severe pain** (educational dimension). He **explained** the transition from an epidural for pain control to oral analgesics, “Whereas with epidural, it was continuously bathing your nerve, whereas with oral if you miss a dose it will take two hours for you to get comfortable and then you will be **miserable** (technologic/physiological dimension).”

This patient had **nausea** despite being required by his nurse to eat before administering an oral opioid containing analgesic (technologic/physiological dimension). His **father** reports his nausea to the nurse while she is at the nurses’ station (political dimension). The nurse reports, "I just gave him the Zofran. Did he **drink** two of the chocolate milks? (technologic/physiological dimension)." The dad replies, "Just one and he hasn't eaten anything but we encouraged him to so he won't get **sick** (technologic/physiological dimension).” The nurse explains, "I **don't think** the nausea can be from the hydrocodone already (educational dimension)." The father qualifies his answer, "Well, he is barely nauseous but we told him **you needed to know** (political dimension)." Slightly over an hour later his nurse asks, "Does your belly feel better?" The patient nods affirmatively and the nurse assesses his intake. His **mother** responds, "He took about two bites and then he said nothing really sounded good (political dimension).” The nurse **assures** the patient’s parents, "His appetite will come back as long as he is drinking we may be able to decrease his IV (social/cultural & educational dimensions).”

This patient had **pruritis** of his incision. He did not have diphenhydramine ordered, but he still **had Nubain ordered** (technologic/physiological dimension). Nubain was **prescribed by** the pain management service for pruritis management while the patient had an epidural (political dimension). The nurse stated "I'm **not sure** if Nubain will help, but if it does perfect, Thank you (educational dimension).” The nurses **failed to identify** Nubain’s analgesic properties (educational dimension). This patient then reported, “I am a little **light-headed”** after receiving Nubain for pruritis (technologic/physiological dimension). The nurse delegated for the care partner to get sitting and standing **blood pressures** (political dimension). She further instructed that if the blood pressure decreased when the patient stood up, the care partner should have him sit down. The blood pressures were the same sitting and standing. The nurse reassessed the patient 27 minutes later, “Are you feeling any better or still **light-headed**? (technologic/physiological dimension)." The **patient replied**, "A little better (social/cultural dimension)." This patient’s **mother** had asked earlier about the humpty dumpty fall risk sign on the patient’s bathroom door (political dimension). His nurse explained that pain meds can make you at **risk for falls** (educational dimension). **Constipation** was another potential opioid related side effect care team members discussed, the surgeon explained, "I also **have you on** a med, Colace; and you want to keep taking the Colace **because** if not you can get constipated and its no fun to push after you have chest surgery (political, educational,& technologic/physiological dimensions)."

*4.6.2 Challenging case*

The previously discussed patient’s transition from epidural analgesia went smoothly, but this patient’s was more complicated. This **9 year old** white male patient’s epidural was pulled due to a fever of **40 degrees Celsius** at 4:45 AM, **three days after** excision of physeal bar right femur (social/cultural & technologic/physiological dimensions). During **formal shift report**, nurses discussed calling the surgeon and anesthesiologist to **escalate** pain management (political dimension). This discussion continued **face to face** between the nurse coming on and going off shift (social/cultural dimension).

The observed nurse stated in **formal report**, "I tried to get it pulled last night (during her previous shift) (political dimension)." The charge nurse went on to report regarding the poor **communication amongst the medical staff**, “CRNA came up and pulled it, and didn't want to **write anything for pain** because she said she doesn't know this kid (political & legal dimensions). “So we called the **surgeon for Motrin,** and he wanted us to wait another hour **for the resident** to come on; but we explained **fever already at 40** (legal, political and technologic/physiological dimensions)." The nurse being observed commented, "Seems like an **incident report** needs to be written up to get **everyone on the same page**, so they **know what to do** when they are on call" (political and educational dimensions).

**Discussion** continued with the night nurse going off shift, "He **doesn't have** any pain med (social/cultural & legal dimensions). When we would call they would just **hang up** on us (political dimension)." The observed nurse responded, "I think an IR should be written about that. Do you know the name of the doctor, because I'm going to **report** this to the Patient Safety Officer (political dimension)."

Nurses **planned interventions.** The observed nurse provided an analgesic as soon as it was ordered for this patient (technologic/physiological dimension).

**Reassessments** alerted nurses to patients' pain (social/cultural dimension). Nurses intervened for post-surgical pain with **biobehavioral interventions** (technologic/physiological dimension) Repositioning and coaching patients to breathe were biobehavioral interventions nurses used to treat pain identified during reassessments. While repositioning is meant to facilitate caring, for orthopedic patients, **movement was the most common contributing factor** aggravating pain after orthopedic and abdominal surgeries. (repositioning is an example of the intraplay within the technologic/physiological dimension).

When the nurse **repositions** this patient, "I'm going to need help holding cast," the patient jumps, "**Oh**! (technologic/physiological and social/cultural dimensions)" **Pain and anxiety** over moving became a vicious cycle (technologic/physiological dimension). The care team repositions the patient's bed. The nurse asks, "Are you hurting?" The patient **nods** (social/cultural dimension). The nurse probes further, "Is it your **leg** or **back**? (technologic/physiological dimension)." The patient **nods** when the nurse says,"back (social/cultural dimension)." As the bed is **flattened** the patient yells, "**Ow**! (technologic/physiological & social/cultural dimensions)" His **mom** encourages, "Let's get you off of your back, baby (political dimension)." The nurse **coaches** the patient, "Can you put this leg down? Great job (social/cultural dimension)." The childlife specialist also **coaches** the patient to take **breathes** (social/cultural & technologic/physiological dimensions). The nurse asks, "Can you **lift leg** (cast leg).” The patient answers, "**No, Ow, ow**! (social/cultural & technologic/physiological dimensions).” The nurse questions, "Where Ow?" The childlife specialist probes, "Your back?" The patient cries, "**Stop it!** (political dimension)" After he was repositioned, the childlife specialist asked, "Does that feel better on back?" The nurse asked, "Where else do you need padding or need to move?" The childlife specialist rephrased her question, "Did that take pressure off your back? Is that medicine starting to work?" The patient responded, "**You can go** (political dimension)."

When given a choice, patients did not always decide to intervene (political dimension). Patients' experiences from **previous hospitalizations and previous surgeries** may have influenced decisions to intervene (educational dimension). This nine year old **patient** decided he **did not** want an intervention at 8:40:28 AM (political dimension). However, less than two minutes later he was **sobbing**, "**I want** to get up here (technologic/physiological & political dimensions).” His care **team**, consisting of his mother, nurse and childlife specialist, again worked to **reposition** him for comfort (political & technologic/physiological dimensions). His mom clarifies, “You want to get your back on this pillow?" The patient disagrees, "**No**, I want to get up here (political dimension)." The childlife specialist tries to clarify, “You want what up there?" The patient's mom **coaches**, "Can you pick up your bottom? (social/cultural dimension)" The patient answers, "**No**, I want you to help me (political dimension).” The patient's mom, nurse, and childlife specialist **lift** the patient as his **mom** continues to **coach**, "Use this leg to lift bottom (technologic/physiological, social/cultural & political dimensions)." The patient replies, "It's not in there." The nurse clarifies, "You want it lower, is that good?" The patient nods **no**, "I want that under (political dimension)." The childlife specialist tries to clarify, "You want your leg higher?" The patient nods again, "**I want** my mom to do it (political dimension)." The childlife specialist **compliments** the patient, "Good job telling us (social/cultural dimension)." His **heart**

**rate monitor** alarms (technologic/physiological dimension). His nurse asks, “Do you want a drink, you want some water after all this craziness?”

This **team** approach was typical when repositioning patients (political dimension). Repositioning this patient took 6 min 38 sec.

His nurse later responded to a false **alarm** of this patient’s pain. At 10:52:47, one of his **doctor’s** reports, “He's hurting (political dimension).” The nurse responds by reassessing the patient, "Are you OK now that you are situated? Are you hurting?" The patient replies, "**No** (political dimension)." The nurse probed further, “Are you sure, ‘cause I can give you **morphine** (technologic/physiologic dimension).”

Two and a half hours later, the observed nurse discusses with the pain management nurse the need to window the patient’s cast in OR, “'Cause he is **not tolerating** anything now (technologic/physiological dimension).” Based on her **past experience** with the patient, the pain management nurse is not surprised, “I would have told you that (educational dimension)." The pain management nurse assessed the patient and asked, “Where is his **mom**? (political dimension)” The pain management nurse reports she was unable to look at the epidural site, "(Patient) **nearly came off bed**, so they can check it under General Anesthesia and I wrote for some **IV pain meds** (technologic/physiological dimension)."

The observed nurse also discussed with the **pain management nurse** the difficulties obtaining orders the previous night (political dimension). The pain management nurse commented, "I **could have told you** the epidural **wasn't going to last three days** it was already rolled up (educational and technological/physiological dimensions)." The observed nurse relayed the story of **resistance to order antipyretics or analgesics** after the epidural was pulled (political dimension). The pain management nurse responded, "We **need to know** that. We are tracking that (educational dimension)." The nurse reports, "Well, I was going to **write it up** (political dimension)." The pain management nurse **encourages** her (social/cultural dimension), “Yes, do that, 'cause sometimes they **don't play nice** and we need to track it (political dimension)." The observed nurse continues to report that the **surgical service** also didn't want to give Motrin, “Everyone wanted to wait for morning (political dimension).” The pain management nurse commented, "That's what they are **paid for** to help when patients need it (political dimension). The **night nurse** should really write it up (political dimension)." The observed nurse agrees, "I told them that, but they **didn't want to** (political dimension)." The pain management nurse again **encourages**, “Please do (social/cultural dimension)." These discussions took a total of 9 min 39 sec of the observed nurse’s time.

Upon returning from the operating room, this patient slept throughout the rest of the observation shift. While this nurse worked hard to advocate for her patient and finally achieve comfort. She did share a **knowledge deficit** with the researcher (educational dimension). She reports she had asked during her previous shift that the Epidural be pulled, “Because it can cause **fever** (technologic/physiologic dimension).” She reported that the surgeon thought it might be atelectasis or wound infection and wanted to reevaluate after patient was up out of bed. The patient’s Foley was out and the surgeon asked to reinsert the Foley rather than pull the epidural. The nurse stated, “I just know we usually pull the epidural if fever is greater than 38 degrees Celsius and this one is greater than 40. The nurse’s knowledge deficit was her misunderstanding that the epidural is pulled so that the catheter in a bacteremic or septic patient does not become a conduit to seed the infection into the central nervous system. She thought the epidural caused the fever and was pulled to reduce the source of the fever.

The nurse’s pain goal for this patient was, “Keep on top of pain with oral or IV pain meds. (I) thought might need IV 'cause not on epidural as long; and keep pain less than 4 because of his developmental delay and changes (spiritual/religious dimension).”

### *4.6.3 Conclusion*

The seven dimensions of bureaucratic caring are all complex aspects of the nursing care required to manage acute pediatric pain. Each dimension of care presents a potential impetus or conflict to achieving the care goal. The interplay of the dimensions for cases of well-managed pain and cases of challenging pain are similar despite conflicting outcomes of the nurses' efforts to manage patients' pains. Themes categorized to the political, social/cultural, educational, technologic/physiologic and spiritual/religious dimensions are noted in these patient experiences. The economic and legal dimensions are notably absent. While two patients were discharged despite pain, two remained hospitalized due to their continued pain. Any economic influences for decisions to discharge patients were invisible to the researcher, and never mentioned by observed nurses. Themes categorized to the legal dimension were limited. All of these patients had legally prescribed analgesics. Dose and interval between doses may have influenced effectiveness of these legally obtained prescriptions, but analgesic action and effect on the patients' physiological statuses was assigned to the technologic/physiological dimension. Each dimension of care plays a part in the whole. The whole is not merely the sum of the parts.

The framework of bureaucratic caring provides a means to explore the complex factors that effect nurses' choices in the provision of pain management to children in acute pain. Nurses act and react to assessments, care planning, interventions, and evaluations; however, nursing reactions are not the effect of actions, but instead are the result of complex personal and system interactions of conflicting priorities. The nurse is recognized as the negotiator of the bureaucracy of caring who facilitates and modulates care decisions to focus on care outcomes.

Exploring the interplay of bureaucratic (political, technologic/physiological, economic, legal) and humanistic (spiritual/religious, social/cultural, educational) dimensions of caring provides insight into the complexity of pediatric nurses' clinical pain management practices. Specifically, describing the outcome of pain control and how the seven care dimensions influence nurses' decisions to treat hospitalized children for pain after surgery. This application of the Theory of Bureaucratic Caring illustrated the interplay of organizational forces and barriers and their effect on nurses' abilities to facilitate choice and achieve caring.

## 4.7 Discussion

Almost all of pediatric post-operative patients cared for during study observations had good pain control. These results conflict with previous research conclusions that pain experienced by hospitalized children is untreated or undertreated. Early studies reached this conclusion by either describing a lack of analgesic administration to children for painful conditions or by focusing on the amount of analgesics administered as compared to recommendations rather than the actual relief of children's post-surgical pain (Burokas, 1985; Eland & Anderson, 1977; Elander et al., 1991; Foster & Hester, 1990; Hamers, et al, Swafford & Allan, 1968).

In this study, nurses negotiated 143 nurse-patient pain assessment interactions. When the 25 assessments of medical patients and 13 assessments of patients using PCA or scheduled analgesics are excluded, 105 nurse-patient pain assessment interactions were used to evaluate pediatric post-surgical patient's pain control. Nurses intervened for 58 of these assessments. Therefore, these children's post-operative pains were treated. There were 25 additional assessments when patients indicated they were not in pain and no intervention was required. These results suggest pain was not only treated, but relieved.

Nurses assessed patients for pain and did not intervene when alerted to their patients' pains 22 times (see Table 4.4). There were six reasons children's post-surgical pain was untreated: patients denied having pain, patients or their family members refused interventions, patients were asleep or dozing, no analgesics were ordered, the nurse forgot, or "just the incision" hurt. Most of these reasons are new findings, not previously identified in the literature as influencing lack of treatment or undertreatment of children's pains. Coincidently, Wallace (1989) found that nurses asked about pain, but didn't intervene in 22 of the 91 observed interactions. The nurses' rationales were quite different than those of the nurses in the current study. Nurses in past studies, questioned patients' credibility and suggested that patients overestimated their pain in an effort to receive higher doses of analgesics (Clabo, 2008). Clabo concluded that the value nurses gave to assessment strategies varied by unit. The current study adds to our knowledge, but more research is needed to determine the influence of organizational culture over nurses' personal values.

Pain management was a priority of nurses' care. Pediatric nurses wanted their patients to be comfortable and their pains tolerable. They wanted their patients' pains to be managed and controlled; and pediatric nurses wanted to meet patients' and their parents' expectations. In observational studies of nurses' care of adult patients, some nurses appeared to accept pain as a normal part of patients' postsurgical courses, whereas the goal of other nurses was to relieve their patients' pains (Dihle et al., 2006; Manias et al., 2005). In vignette situations, pediatric nurses' pain relief goal was the single most important factor affecting nurse's analgesic administration decisions (Burokas, 1985). Nurses who chose the goal of pain relief in Burokas' study also stated they would provide more analgesics than nurses who did not express pain relief as their pain management goal. These differences in nurses' pain management goals may influence nurses' pain management practices; but only 12% of 134 nurses confirmed complete pain relief was their pain management goal back in 1985 (Burokas). Ten years later, Woodgate & Kristjanson, (1996a), concluded that parents and nurses had minimal expectations of pain relief for pediatric post-surgical patients. Now in 2010, the only nurse who stated her pain goal was to make sure patients are pain free was the nurse who did not have any patients in pain during her shift. The pediatric nurses' goals were consistent with the hospital's goal of pain reduction, rather than pain relief, suggesting alignment with organizational culture. For the majority of patients, this goal was achieved.

Pediatric nurses' beliefs, perceptions and misbeliefs regarding postoperative pain management have been surveyed (Christenson, 2000; Margolius, Hudson, & Michel, 1995). The most prevalent belief of Margolius et al.'s survey was that infants and children seldom need analgesics for pain after surgery. Pediatric nurses in Margolius et al's survey indicated that feelings of powerlessness and limited collaboration hindered their ability to manage children's pain; whereas, pediatric nurses responding to Christenson's survey no longer reported these misbeliefs. They believed they had a powerful influence on children's pain management; however their perceptions of whether nurses actually exercised this power in clinical practice were not as strong (Christenson). No resistance to medicate infants and children for pain after surgery when analgesics were available and due was observed in the current study. Nurses did, however, fail to escalate to prescribers when children's pain was not well controlled, unless the prescriber was readily available rounding on patients. This also may reflect nurses' level of power and communication patterns in the political dimension of this organizational culture.

In this study, knowledge deficits regarding pain and pediatric pain management were rare. The most common knowledge deficit observed related to nurses' understanding of the mechanism of nausea and the potential for nausea from opioids. This knowledge deficit was reinforced by notes in the medication administration record for analgesics to be given with food for all ordered oral opioid containing analgesics, despite a lack of evidence to support this recommendation. Experienced nurses even delayed analgesic administration due to this knowledge deficit; but they did not withhold or deny medication administration.

Pediatric nurses' actions to prevent opioid related nausea have not been previously recognized. In the literature, pediatric nurses reported an exaggerated incidence of opioid related respiratory depression and exaggerated the incidence of opioid addiction (Vincent, 2005). Pediatric nurses observed in this study did not report concerns or appear to be overly concerned about opioid-related respiratory depression; and opioid addiction was never mentioned during the study observations.

Previous assessments of nurses' knowledge, attitudes and beliefs have failed to completely explain forces that promote or deter nurses from intervening to relieve children's acute pain. Patients in this study had good pain control despite the rare analgesic knowledge deficits of nurses, physician assistants, and pharmacists. Equianalgesia, one of these rarely observed knowledge deficits, can be directly tested through questions contained in the Pediatric

Nurses' Knowledge and Attitude Survey Regarding Pain (Manworren, 2001). Nurses' knowledge regarding titration of opioid analgesics can also be tested using the Survey; but when nurses should escalate pain management concerns to prescribers is not tested. Nurses in this study did not contact prescribers for pain reduced but not relieved by current analgesic orders. Future research that compares nurses observed actions to their responses to questions of equianalgesia and titration from the Pediatric Nurses' Knowledge and Attitude Survey Regarding Pain may help to differentiate whether failure to escalate is influenced by knowledge or the political dimension of bureaucratic of caring.

The results of this study suggest that nurses' current knowledge, attitudes and beliefs promote successful intervention to relieve children's acute pain. These results also suggest that the organization's goal for pain management and processes to support this goal influences outcomes. These results conflict with previous research that revealed inconsistencies between nurses' knowledge and attitudes regarding pain management and actual clinical practice. Therefore, it was necessary to not only explore pediatric nurses' knowledge and attitudes regarding pain, but to investigate pediatric nurses' actions to assess and manage children's acute post-operative pain on a pediatric post-surgical unit through observation of their actual clinical practice.

Formal handover process communication was observed to be standardized in this study setting. Standardized communication assured consistency in reporting administration of PRN medications for patients whose surgeries were less than four days prior to the observation. Nurses did not use broad statements or reflect on functional goals. This contrasts with the formal handover process communication reported in previous studies. Manias (2003) found that nurses reported demographic and medication administration information, as well as broad statements such as "moderate success" rather than functional details regarding the effectiveness of pain management interventions (Manias, 2003, p. 590). Brown and

McCormack (2006) found that pain was only mentioned if patients were experiencing problematic pains or if patients' pains were treated with pain management technologies.

Woodgate & Kristjanson, (1996a), also found nurse to nurse communication regarding pain was general. Value was placed by parents and nurses for children being "good" and tolerating or coping with more pain than other children who displayed more overt signs of pain (Byrne, et al., 2001; Woodgate & Kristjanson). This was not true in the present study. Nurses intervened for patients who were crying, whining, kicking, and screaming. Only once during the study was pain tolerance mentioned. Nurses did informally communicate inconsistency with their expectations of patients' pain behaviors, patients and family members' pain management expectations, and pain management orders during face to face handoffs to individual nurses after formal shift reports.

Nurses in the current study stressed functional milestones, staying on the expected schedule of recovery, when communicating the plan of care to parents and patients, rather than in formal handover report. In addition, nurses in the current study assured their patients were comfortable to meet these care expectations by pre-medicating and using advanced planning to intervene with analgesics. Byrne, et al. (2001) identified that for nurses doing well meant reaching functional milestones, staying on the expected schedule of recovery, and not displaying pain behaviors regardless of whether the patient was in pain. Byrne, et al. (2001) concluded that nurses defend themselves emotionally against patients' pain. This emotional need may also explain why nurses in the current study needed to vent during face to face handoffs to individual nurses about inconsistencies with their expectations.

Of the 46 post-surgical patients cared for during the current study, there was no observable pain assessment as part of the initial assessment of only 9 patients; and 7 of the 19 medical patients were not assessed for pain during the nurses' initial assessments. In contrast, Manias et al. (2004) reported almost half of the nurses did not conduct any form of pain assessment during observations.

Pain is defined as “whatever the experiencing person says it is, existing whenever he says it does” (McCaffery, 1968, p. 11). Self-reports of pain from the patients were the most common pain assessment technique used in this study. This technique was used by every nurse and observed 47 times with 21 patients between 2 and 17 years of age. Most of the nurses’ pain assessments started with a cordial “How are you doing?” or “How are you feeling?” followed by a patient’s report or use of the number pain scale. The literature reports similar findings with some nurses merely asking patients simple but ambiguous pain assessment questions, like “you ok” and “how are you?” (Brown & McCormack, 2006, p. 1293; Dihle et al., 2006, p. 473). In the current study, two pediatric surgical patients’ pain assessments were limited to these cordial means. This technique was slightly more common with medical patients. None of the pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases was limited to cordial assessments.

The numbers pain scale was the standardized pain scale used the most to assess pediatric patients’ pains during the current study observations. The numbers pain scale was only used to assess and reassess 13 post-surgical patients’ pains by 10 nurses. This usage was comparable to Manias’ (2003) results, although Manias’ study includes exclusively adult patients and there were only 23 post-surgical patients over 7 years of age during this study’s observations.

Pain is also defined as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (Merskey & Bogduk, 1994, p. 209-211). Crying alerted nurses to patients’ pains; and crying was the assessment for 12 of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases**.** Crying patients were between two weeks and six years of age.

Previous research has concluded that ineffective communication, such as ambiguous pain cues, hindered pain management and this has implications for further study in pediatric postsurgical patients who may not be able to clearly articulate their pain and whose pain management decisions often include a guardian or family member (Manias, et al., 2005). Nurses reported success and challenges when having to rely on children's behaviors to assess pain (Gimbler-Berglund et al., 2008). Gimbler-Berglund et al. (2008), observed minimal dialog between parents and nurses regarding children's pain, but noted that nurses relied on parents to tell them when their child was in pain.

Nurses in the current study did not seem to be hindered by ambiguous pain cues, because children either self-reported their pain or demonstrated significant behaviors of distress. The challenge for nurses was not identifying patients' pain, but how best to intervene when ordered analgesic options were exhausted. Little dialog was required between nurses and parents, because nurses intervened whenever parents requested, with whatever analgesic parents preferred their children received. This is the first study to report pediatric nurses' reliance on parents to make analgesic decisions, even deferring choice between analgesics to parents' discretion.

Post-surgical patients were hospitalized for 0 to 22 days for a mean of only 3 days. Of the 46 post-surgical patients, 10 were discharged by the observed nurse the day after their surgery. Whereas, another 10 patients had surgery 4 to 12 days before the observed shift; but only 9 of the 58 pain alert to intervention cases included patients who had surgery 4, 5, and 8 days prior to the observed shift. Woodgate & Kristjanson, (1996a) concluded duration of pain seemed to be more important to parents and nurses than intensity of pain, since nurses gave the majority of analgesics during the first 48 hours after surgery when they expected pain to be moderate to severe. The short post-surgical stays observed in the current study limited opportunities to assess nurses intervention patterns for extended surgical stays.

Nurses' assessments and pain assessments were often bundled with medication administration. Patient's cried during dressing changes, despite being pre-medicated for pain. Medications appeared to be ineffective for the pain of these procedures; yet, patient's quickly calmed when the procedure was completed. Manias et al., (2002) concluded that nurses tended to be very attentive at times when other assessments were being made, but were less attentive with dressing or position changes. In a manner similar to that observed in the current study, Manias et al. (2002) noted, nurses would acknowledge the patients' statements of pain but continue with the activity. The only difference in these observed care patterns was that nurses were observed to administer analgesics after, rather than prior to, painful procedures during Manias' observations (2005).

Manias et al., (2002) also identified nurses' persistence in identifying the site of pain as the surgical incision rather than attending to other causes of patients' pain, such as catheters. Whereas in the current study, nurses did identify intravenous catheters as the site of pain for several patients; and acted appropriately to relieve pain from this non-surgical source.

Research suggests that children's characteristics and previous pain experience influence their interpretation and response to pain. No gender differences were identified in this study. This is consistent with the preponderance of research that has also been unable to show a relationship between gender and pain response. Examination of NHAMCS data from 1992 to 1997, suggested evidence of racial and ethnic disparities in the treatment of children's pain (Hostetler, Auinger, & Szilagyi, 2002). No ethnic or cultural disparities in care were observed in the current study.

Children's previous experience with pain, however, did seem to hinder efforts of nurses in this study to reduce pediatric post-surgical patients' pains. Research distinguishes that it is not just the past exposure to pain that affects a child's subsequent response; but that fear and anxiety may intensify the perception of pain, especially if previous experiences have been negative (McGrath & Hillier, 2003; Rocha, Prkachi, Beaumont, Hardy & Zumbo, 2003). Yet, the 15 year old female one day after laparoscopic cholecystectomy reported better pain control for all of her previous surgeries. An alternative and unique explanation given for this patients' pain was low pain tolerance. Research regarding children's pain tolerance has been limited to parent's perceptions (Cheng et al., 2003). While parents' predictions of pain tolerance in needle procedure pain studies significantly correlated to actual distress behaviors exhibited; when the focus of the research was more unique pain experiences, such as pain after spine surgery, parental predictions of children's pain tolerance did not correlate with children's self-reports of pain intensity (Foster, Yucha, Zuk & Vojir, 2003; Kotzer, 2000). This patient's mother also expressed concern that her child's pain was far worse than she had experienced after other surgical procedures. Observations from the current study suggest any previous experience with pain from surgery or hospitalization will influence pediatric patients' interpretation and response to pain. More research is needed to clarify the relationship of children's previous pain experiences and their influence on patients' subsequent post-surgical pain experiences.

Three different nurses and one surgeon advised patients, parents, and a grandmother to avoid severe pain in the current study. Nurses communicated their pain expectations regarding 10 patients to patients, parents and the researcher, 4 of these patients had pain that was challenging to control. The nurses communicated that complete pain relief was an unrealistic expectation. Manias (2003) also observed nurses reminding their patients of the importance of reporting pain to ensure that they received adequate pain relief (Manias, 2003). Although, Manias' (2003) observed that nurses were inconsistent with how they expressed the value of this information. Nurses either praised patients for waiting to request analgesics; or nurses used repeated questioning to find out the 'truth' about their patients' postoperative pain (Manias, 2003). Neither of these examples was observed in the current study.

In the current study, dosage ranges were rarely ordered, but analgesics were ordered PRN and multiple analgesics were ordered providing nurses an opportunity to choose the optimal interventions for their patients. Just over half (25) of the 46 post-operative patients had more than one analgesic ordered during the observation. While 11 post-operative patients had scheduled and PRN analgesics ordered, only one nurse gave them at the same time.

Analgesics were given when scheduled, with nurses giving PRN medications on a scheduled basis for 13 of the 58 pain assessment to pain interventions cases. Nurses gave the other 30 PRN analgesic doses as needed when pain was identified during initial assessments, reassessment, or when analgesics were specifically requested. Key patient examples demonstrate that when nurses provided PRN analgesics on a scheduled basis, patients' pains were not just reduced, tolerable, or controlled, they were relieved. This study confirms that nurses are enabled in their decisions to administer analgesics through their reliance on the predictability of the expected course of pain related to the condition (Willson, 2000). Like Simons and Moseley's (2008) study results suggest, analgesics were more likely to be given if they were regularly scheduled, than if they were prescribed PRN (pro re nata) as needed.

Nurses both policed pain management to ensure routine medications were given on time and withheld analgesics from patients in pain until the next dose was due. One nurse even identified that the analgesic wasn't lasting the full duration of the dosing interval, but made the patient wait 40 minutes for one dose and 30 minutes for the next dose.  She gave both doses right on time! This is consistent with Manias et al.'s (2005) conclusion that nurses are regulators and enforcers of pain management.

Nurses tried to transition patients to oral analgesics to prepare for discharge home. When given a choice, nurses tended to choose oral analgesics, but were able to clearly articulate their clinical rationale for analgesic choice. Willson, (2000), also found that goals for analgesic administration were strategic and discharge oriented during the day.

All patients over 50 kg and all but 2 patients weighing less than 50 kg were prescribed hydrocodone doses consistent with the American Pain Society's dosage range; but at these dosages, only 2 patients weighing less than 50 kg received the recommended acetaminophen dose. Some of the pain reassessments were obtained prior to the predicted onset and peak of analgesia, but at least three patients continued to have moderate to severe pain beyond the predicted peak of analgesia for the medication administered. These children's pain was undertreated according to their reports of pain, but their analgesic dosages were within the American Pain Society's recommendations. Nurses did not escalate to prescribers to titrate analgesic doses.

Nurses were also challenged with determining equianalgesic dosing and the appropriate dose for larger teenagers (weighing 89kg and 104kg). This conflicts with Christenson's (2000) finding that pediatric nurses were better able to choose the appropriate dose for older children than they were for infants and toddlers. Other more recent studies, found children's age, race and gender did not seem to influence nurses' analgesic administration patterns (Griffin et al., 2007; Vincent, 2005; Vincent & Denyes, 2004).

Nurses intervened with biobehavioral interventions 15 times. A variety of biobehavioral interventions were used: swaddling, pacifier, consoling, repositioning, heating pads, and distraction. Biobehavioral interventions did not appear to be effective. All but three patients who received biobehavioral interventions also received analgesics. Biobehavioral interventions were usually given when it was not time for the next dose of an analgesic. This finding is consistent with other research. Of the 35 interventions observed in Wallace's (1989) study, analgesic administration was the primary intervention. Only six interventions were non-pharmacologic; and five of these were repositioning the patient. Brown and McCormack (2006) also comment on a lack of observed non-pharmacologic strategies and nurses reliance on analgesics.

Pediatric nurses let patients and parents decide to intervene with PRN analgesics or biobehavioral interventions and even offered for them to choose between two ordered analgesics. Six nurses let eight patients make the decision that resulted in sixteen interventions. The youngest patient asked to decide was a six year old female. Manias et al., (2005), also described how nurses engage patients in decision making for pain management. Manias et al.'s, (2005) patients, however, were adults deciding on their own care management. This is the first study to describe nurses' requests for pediatric patients' to decide whether or not they require an analgesic intervention for pain. The majority of decisions were made by children who had no previous experience with surgery or hospitalization. More research is required to verify these results and determine the developmental skills patients need to make appropriate pain management decisions.

It was far more common for nurses to let parents decide whether or not to intervene for patients' pains. Nurses coached parents to ask for analgesic interventions. While some parents in the current study appeared comfortable making these clinical decisions, others verbalized their uncertainty. Nurses also shared with the researcher excellent rationales for disagreeing with parents' and patients' decisions, but deferred to their decisions anyway. These deferred decisions seemed to be a reflection of organizational culture.

As predicted, the role of the family in pain management was a variable of significant influence for pediatric patients as compared to what was reported in the adult studies. Parental presence was expected. All but five patients had parents, guardians, or other family members with them during the entire shifts observed. Parents and grandmothers were treated with the same degree of respect and authority for the care of the pediatric patients, although only a few fathers and grandmothers were observed. Parents and grandmothers either alerted nurses by calling out to request pain management interventions or alerting the nurse while they were in patients' rooms assessing and treating patients. Nurses relied on parents to alert or confirm that a child was in pain during reassessments. Nurses also relied on parents to verify their assessment of patients' pains, provide supplemental information to clarify the patient's pain assessment, or to coach their children to assist the nurse with her assessment efforts over 40 times during the study observations. The unit's culture was one of responsiveness to parents' requests for analgesics and decisions regarding type of analgesic. Nurses deferred to the parents, and did not assert their professional clinical judgment when their decisions differed from the parents. Nurses relied on parents' assistance to intervene with analgesics. While parents assisted nurses with medication administration, parents of the children two to seven years of age preferred not to administer the analgesic. When asked in post-shift interviews what helped the nurses meet their pain management goals, nurses mentioned the “Parents.” One nurse summed up the culture of family centered care, “Just do whatever parents want, that's what we do here, isn't it? They are really nice."

The organizational culture at this study site, specifically demonstrated by the 14 pediatric nurses observed, was one of partnering and meeting parents’ expectations for care and respect for parents’ knowledge of their children. Nurses had previously cared for many of their assigned patients; but nurses’ familiarity of their patients did not seem to influence their pain management practices, especially when the patients’ pains were inconsistent with their clinical expectations. Recently published results of semi-structured interviews with pediatric nurses in Sweden provides evidence that cooperation with parents as well as the nurse’s relationship or knowledge of the child in pain are key factors that influence nurses’ pain management practices (Gimbler-Berglund, Ljusegren, & Enskar, 2008). Swedish nurses noted that lack of successful cooperation with parents resulted in delayed pain relief for pediatric patients.

Nurses tried to educate parents and patients when there was a discrepancy between the patients’ reports of pain and the nurses’ expectations. Nurses educated parents and grandmothers about analgesic effects, specifically onset and duration of analgesic action, as well as side effects, like pruritis and sedation; and nurses provided additional analgesic education upon discharge. Previous research emphasizes parents’ pain perceptions, expectations, beliefs and treatment concerns influence children’s pain experiences (Cusick, 2003; Huth et al, 2003; Miaskowski, 2003; Schechter, Berde, & Yaster, 2003). Researchers have suggested supplying information and discussing parents’ concerns regarding pain and pain management may be effective for updating parents’ knowledge and assuring the parental participation necessary for providing optimal pain relief for children (Huth et al., 2003; Polkki, 2002; Simon, 2002).

Nurses relied on parents' assistance for providing biobehavioral interventions. When nurses responded to alerts of patient's pain, parents were already consoling their babies and children in a manner socially and culturally acceptable to the family based on past experiences between the parent/child dyad. Pediatric registered nurses reinforced biobehavioral efforts initiated by parents, including the use of heating pads and distraction. Repositioning of patients after orthopedic surgery was the only biobehavioral intervention that required a more collaborative effort relying on the nurses' clinical expertise and the parents' familiarity with the child's positioning preferences. None of the repositioning interventions, however, seemed to actually increase patient comfort. These may have merely been treatments to decrease swelling which may then eventually decrease pain. Nurses provided biobehavioral interventions in addition to analgesics to bridge the gap between doses of analgesics.

Observations from this study suggest nurses' lack of reliance and time expenditure on biobehavioral interventions may actually reflect the lack of effectiveness of these interventions. This explanation builds on Manias et al.'s, (2005) conclusion that observed nurses rarely used biobehavioral interventions due to time constraints. Observations in other pediatric studies suggest a similar lack of nurses' use of biobehavioral pain management strategies (Twycross, 2007a; Woodgate & Kristjanson, 1996a). Woodgate and Kristjanson (1996a) described comforting techniques as being the duty of the parent while nurses carried out the more technical pain care activities. These are excellent explanations for why biobehavioral comforting techniques are considered the duty of the parent. Based on the observations of the current study, it is also suggested that patient preference and proximity be included as explanations for why biobehavioral techniques are entrusted to parents' responsibility. Biobehavioral interventions were categorized to the technologic/physiological dimension, but results of this study suggest they may not actually modify pain, but more accurately reflect a social/cultural dimension.

Nurses rarely escalated pain management decisions to the prescriber or pain management team. Nurses commented in post-shift interviews that having correct analgesics ordered and available facilitated achieving their pain management goals for their patients. Lack of communication between the surgeon and physician assistant was also mentioned as a hindrance to achieving a nurse's pain goals. There were six examples during four different shifts which illustrate the hindrance poor communication among the medical staff had on managing pediatric patients' post-surgical pains. Unfortunately, nurses also bore the brunt of responsibility for these miscommunications. Perhaps this reinforced resistance to promptly consult prescribers. Instead, nurses waited to alert prescribers to patients' pains and miscommunications when they came to the unit to make patient rounds. While physician assistants rounded in the morning and then again in the afternoon, other physicians and surgeons rounds were unpredictable. There were no policies or procedures identified to deter contacting prescribers, and in fact nurses had contacted attending physicians of medical patients for orders and order clarification. Both the literature and these study results suggest communication with prescribers is a political influence nurses must negotiate to effectively relieve their patients' pain. These factors were categorized to the political dimension of the bureaucracy of caring; and these factors also hindered the pain management of patients whose pain was challenging to control in this study. Previous researchers also stressed the importance of interdisciplinary communication and nurse-physician cooperation as important for providing satisfactory pain relief (Brown & McCormack, 2006; Gimbler-Berglunch et al., 2008; Manias, 2003; Wilson, 2000). Swedish nurses expressed concern that hierarchical relationships, organizational structures or characteristics of individual healthcare professionals may be barriers to good cooperation (Gimbler-Berglunch et al., 2008). More research is needed to determine why nurses were resistant to consult prescribers when they were not physically on the nursing unit.

Previous observational studies focused on individual nurse-patient interactions related to pain, as if assessment, treatment and reassessment are a linear relationship, isolating these interactions from the complexities of managing a patient load on a postsurgical ward. Time from alert to intervention with PRN pain medications or biobehavioral interventions were efficient when nurses were able to focus on just the one individual patient's needs from the start to the finish of this process. This is the first research to quantify the time triaging other care priorities, delays, consults, and interruptions added to this process. Surprisingly, nurses were able to intervene for the 58 cases in an average of 10 min 51 sec.

Traditional human factors engineering methodology presumes that effective, efficient and safe processes take into account physical, cognitive and organizational capabilities and limitations, such as noise, lighting, short-term memory, fatigue and decision-making approaches (Boston-Fleischhauer, 2008). Overt physical activities can be observed and the efficiency of processes evaluated.

In this study, time from alert to intervention with PRN pain medications or biobehavioral interventions for the 58 cases ranged from 0 to 48 min 6 sec. Time from alert to intervention was immediate for 9 cases. Immediate response cases were the result of advanced planning (4 cases), pre-medication (3 cases), and biobehavioral interventions (2 cases).

While previous researchers have identified shift-related time constraints, interruptions, busyness of nursing work, prioritizing of other tasks, and timing of medications as support for identifying time as a key issue, data that quantified time elements were rare and required further study (Manias et al., 2005; Wallace, 1989; Willson, 2000). Wallace (1989) timed 47 nurses' responses to patients' pain during 91 interactions. The average time for pain interactions was 5 minutes. The nurse left the patient's room and returned to intervene in an average of 3.54 minutes, excluding times when nurses didn't intervene, intervention was immediate or the patient requested not to have a pain management intervention. Wallace (1989) did not report on what the nurses did during the time they were away from the patients' rooms.

In this study, travel time to secure analgesics from the centralize medication room only added an average of 34 sec for the 45 analgesic interventions. Is this the most efficient place to store medications if response to patients' pain is a priority? Wallace (1989), noted response time was minimal in hospital rooms with analgesics stored in the rooms. Would this improve efficiency in this bureaucracy of caring?

Co-signing controlled substances added an average of over 2 minutes to 40 cases, even though response time from co-signers was less than 79 sec in all but three cases. Co-signers in this organization actually co-sign twice for every administration of a controlled substance due to the required use of two different documentation systems, an automated dispensing machine to procure opioid analgesics and an electronic medication administration record. Two documentation errors and a delay from a nurse forgetting to sign out of one system were observed during the study. These information systems need to communicate and duplication in work processes eliminated to decrease nurses workload, time to patient response and potential for error.

When oral analgesics were administered, nurses also spent an average of 94 sec gathering liquids and crackers for patients to take with their medications. Assistive personnel could be better utilized by adding delivery of water, drinks and snacks to their list of routine responsibilities. Administering oral analgesics required an average of 77 sec, but as long as over 7 minutes for one child who disliked the taste of the medication. Rather than nurses mixing analgesics with syrup, medications could be formulated to be more palatable for children. Analgesics can not relieve children's pain if children won't swallow them. Finally, administration of time and technique for intravenous opioids varied from 98 to 974 sec. The most efficient and safest procedure for intravenous opioid administration is a necessity to standardize administration and minimize potential for error and patient harm.

This study was the first that tracked all pediatric nurses' activities and their relationship to pain management efforts. Nurses were interrupted between being alerted to their patients' pains and intervening. The shortest interruption was 21 sec while a patient's bed was moved and the longest interruption was 2 min 3 sec to answer a phone call. Nurses' responses were delayed. Delays were related to waiting in line for the medication room computer and the automated dispensing system or response delays of these computer systems, looking for patient stickers to label medications, waiting for pharmacy to add a patient into the medication administration system, and a nurse leaving before completing the co-sign procedure of the automated dispensing system. Other activities nurses engaged in between being alerted to a patients pain and intervening were consults, isolation procedures, triaging care priorities, and co-signing controlled analgesics for other nurses. These results provide additional detail and further support for Manias et al., (2002) findings that there was considerable delay from patient request for analgesia to medication administration due to interruptions. While Manias et al., (2002) did not time these interruptions; similar to the current study these interruptions were described as searching for equipment, responding to requests for assistance from nurses and student nurses, answering or making telephone calls, and performing other time-related tasks, like medication administration.

Nurses' cognitive processes, however, are not easily observed (Potter et al., 2004). Nursing care is nonlinear and involves complex clinical reasoning and decision-making based on patients' changing status. Potter et al., found that nurses spent an average of 31 minutes in each patient's room during the observations, but nurses averaged 46 minutes of cognitive focus per patient over the same observation period. In the current study, nurses spent a similar 37 minutes in patient rooms per patient and an additional 72 minutes per shift in non-meal breaks. These non-meal breaks are potentially the time nurses are in unobservable activities which allow them to plan for patient care and make clinical decisions. Researchers emphasize that traditional human factor engineering analysis may therefore underestimate the time nurses need to provide care to patients (Potter et al.).

In the current study, nurses spent 17 min to 180 min for an average of 83 min or 11% of their shifts in care activities related to pediatric pain management on a post-surgical care unit. This is the first study to quantify the amount of time pediatric nurses spend in pain management related care activities. Nurses spent 23% of their time in patient's rooms. This is consistent with larger studies reporting nurses spend about 25% of their time in patient rooms (Hendrich et al, 2008).

Potter et al., (2005) reported nurses were unique in the manner in which they organized and approached patient care, with some nurses starting their shift by conducting rounds and then proceeding with interventions, such as medication administration; and other nurses first preparing all morning medication and then conducting patient rounds. Like Potter et al., (2005), differences in the manner in which nurses organized and approached care were observed in the current study. Three findings from the current study are of particular interest for describing pediatric nurses' pain management styles. These findings are nurses' use of handoff report information in planning care, timing of initial assessment, and scheduled administration of PRN analgesics. While nurses routinely provided nurses taking over the care of patients with information about the patient's pain management during the previous shift, including difficulties, this did not seem to influence when the nurse assessed patients for pains or how they reacted to the patients' reports of pain. There was, however, evidence that nurses used this shift report information regarding timing of analgesic administration for planning care. Five of the fourteen nurses performed their initial patient assessments by room number order. Only one nurse bundled her initial assessments with other care tasks, like the administration of a scheduled analgesic. Five patients were in pain when initially assessed or before assessed by one of the 11 nurses who assessed patients early. Whereas, four of the patients cared for by one of the three nurses who started their initial assessments after 8 o'clock were in pain at or before the time of the assessment. Assessing patients early may prevent unnecessary suffering and interventions delays. This is a new finding with implications for nursing practice.

Pediatric nurses in the current study both administered analgesics when children complained of pain and administered analgesics on a regular basis. Nurses used advanced planning to prevent pain, rather than just reacting to pain assessments. Nurses pre-medicated their patients for the potential pain from dressing changes, sitting, walking, and physical therapy. While one nurse expressed her concern that physical therapy might not notify her in advance of the time of therapy, physical therapists were consistent in notifying nurses of therapy times, even changing times to assure patients were pre-medicated during current study observations. Dihle et al. (2006) also observed several nurses giving analgesics prior to patient mobilization, but other results of Dihle's study "The gap between saying and doing in postoperative pain management," contrast with current study observations.

Nurses' journeys to relieve children's pain started with a plan. Nurses organized their care differently from the onset of the journey, with some nurses initially assessing patients as soon as formal report ended and other's waiting, some assessing patients by room number order and some taking a different route. Nurses shared their care plans with patients and parents. Charge nurses notified them of detours. Nurses modified their plans to triage care priorities, accommodate discharges and admissions, even to negotiate a lunch break. More importantly nurses modified their plans to achieve their goal of managing and reducing their patients' pains to a comfortable and tolerable level. They achieved this goal by the end of their shift for all but 5 of the 46 post-surgical patients cared for by 14 nurses on 14 different journeys to relieve children's post-surgical pains. Previous observational studies of pain assessment and management were staged at what were described as "key periods for activities relating to pain" (Manias, 2003; Manias et al., 2002; Manias et al., 2004; Manias et al., 2005). Two-hour block time intervals failed to provide sufficient opportunity to observe how nurses' familiarity with their assigned patients and changes in care demands throughout a shift influence their pain management decisions.

Yet, like Twycross (2002, 2007a, 2007b, 2008), this researcher did observe inconsistencies with pediatric clinical practice guidelines. Specifically, nurses did not (a) obtain a pain experience history routinely on admission, (b) use valid and reliable pain assessment tools consistently, (c) use biobehavioral interventions for pain relief routinely, or (d) seek advice from the multi-disciplinary team regarding managing children's pain. However, the results of the current study question, (a) the necessity of obtaining a pain history for patients whose pain is not challenging to manage, (b) whether valid and reliable pain assessment tools are actually useful for identifying post-surgical pain necessitating intervention, and (c) the efficacy of routine use of biobehavioral interventions. Therefore, results of this study emphasize that the only meaningful inconsistency with clinical practice guidelines observed was lack of consultation and specifically escalation to prescribers for uncontrolled pain. Increased utilization of escalation may positively impact pain management outcomes. However, as Twycross' (2007a, 2008) suggested professional socialization and lack of role models to challenge the organizational culture not only explain these findings but may deter this necessary practice change.

Results of this study suggest nurses' knowledge deficits are unique; and nurses need coaching for pain that is challenging to manage. Unfortunately, Johnston, et al. (2007) found one-on-one coaching to be ineffective; but perhaps Johnston et al.'s results reflect the way coaching was provided. Findings from this current observational study stress that coaching can not be provided from an office; rather the coach must walk with the nurses in their journeys to relieve children's pains.

Overall, pediatric post-surgical pain was well managed by pediatric nurses in the present study. Results indicate that pediatric nurses in this organization managed pain by relying heavily on parents, patients, analgesics, and their previous clinical experiences. Previously published observational studies reviewed stressed the strength of observation methods to ascertain what actually happens in clinical practice and identify variables susceptible to intervention (Byrne et al., 2001; Dihle, et al., 2006; Twycross, 2002, 2007a, 2007b, 2008; Woodgate & Kristjanson, 1996a) The current study adds to our knowledge of how pediatric nurses assess and manage children's post-surgical pains, and what influence nurses' actions to relieve children's acute post-operative pain on a pediatric post-surgical care unit, including insights into nurses' decision-making processes, priorities, and organizational factors that may influence pain assessment and management clinical practices.

Twycross (2007a, 2008) had concluded that observing pediatric nurses' practice on a single unit in a teaching hospital in England provided evidence of poor pain management practices, but was insufficient for ascertaining whether these practices truly reflected a single ward's organizational culture or a more general professional culture of pediatric nursing. The inconsistency of Twycross' results and the results of the current study lend support to the need for further observational studies of pediatric nurses care of patients with post-surgical pain. The primary limitation of both the current study and Twycross' work is that findings represent observations of a single unit at a single hospital reflecting the culture of caring on these particular pediatric post-surgical nursing units. Hence, the findings are not generalizable to other pediatric post-surgical nursing units or the more general professional culture of pediatric nursing. In light of the contrasting findings from these two studies, more research is needed.

This observational study provides evidence that children's routine pain management after surgery achieves the pain management goal of the organization and its nurses. Pain was reduced, controlled, managed and considered tolerable. Having analgesics ordered and available to administer influenced nurses to provide analgesia. Severity of children's reports of pain did not seem to influence nurses' responsiveness, as evidenced by nurses' decisions to intervene even for post-surgical patients who denied pain. Nurses would not intervene, however, if adolescent patients and parents refused interventions.

The current study provides evidence that inadequate or insufficient analgesic orders are a real barrier to optimal pediatric post-surgical pain management. This finding is consistent with survey results that reported the top two barriers to optimal pain management were inadequate or insufficient orders and the medical staff's low priority for pain management (Vincent, 2004; Vincent, 2005). While the current study does not provide any data to evaluate the medical staff's priority for pain management, nurses' hesitance to contact prescribers when analgesics orders are inadequate or insufficient was also a barrier to optimal pain management. Nurses communicated to physician assistants and resident surgeons their concerns about patient's pain management during their patient rounds. These individuals were receptive to nurses concerns and even acted on these concerns, but communication amongst the medical staff suggested conflict regarding actual analgesic orders. Communication with and amongst the medical staff must therefore also be included as a primary barrier.

Pain is a complex phenomenon that involves physical, sensory, affective, emotional, cognitive, and behavioral components that are interrelated with environmental, developmental, sociocultural, spiritual and contextual factors, which affect how pain is perceived, managed and evaluated (AAP & APS, 2001; Cheng et al., 2003). Nurses' struggles to manage challenging pains provide the best examples of the complexity of the phenomenon. Six patients had challenging pain during this study. These patients had previous experiences with pain from hospitalization and surgery or analgesic side effects, experienced pains beyond the patients' expectations and the expectations communicated by the nurses, movement and anxiety aggravated their pain, and their nurses received inappropriate responses from the on-call prescribers. Nurses attempted to navigate these barriers and roadblocks, by planning interventions and providing biobehavioral interventions when analgesics were not ordered or not due. The complexities of these experiences emphasize the complexity of factors that influence nurses' actions to relieve children's acute post-operative pain on a pediatric post-surgical care unit. The Theory of Bureaucratic Caring provides a unique perspective to investigate the complex phenomenon of acute pediatric post-surgical pain management.

Ray's Theory of Bureaucratic Caring provides a guide for categorizing these roadblocks, explaining the work of nurses in clinical practice and factors that effect performance outcomes. This study was the first attempt by nurse researchers to apply this theory to clinical practice. Therefore, these results provide further support, definition, and description of the dimensions of caring (see Figure 4.1).

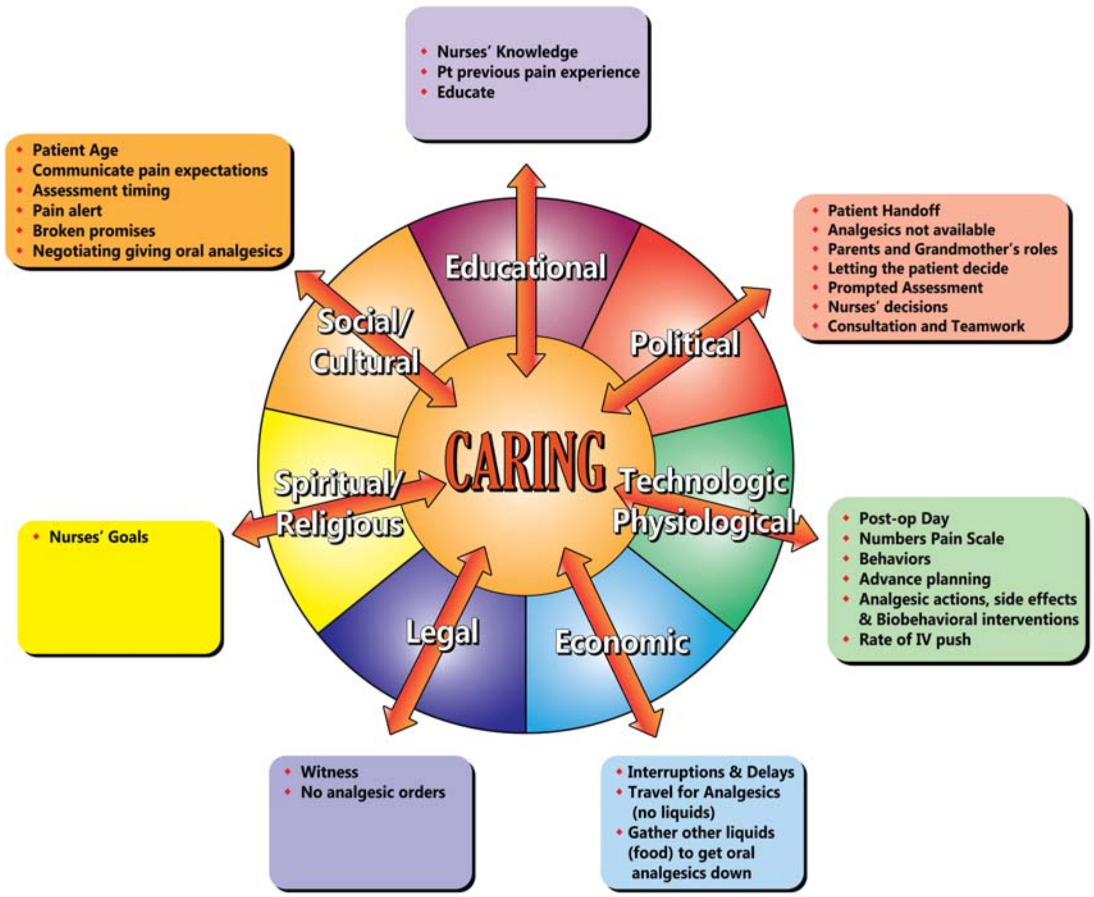


Figure 4.1: Adaptation of Ray's Theory of Bureaucratic Caring for the Clinical Problem: Pediatric Post-surgical Pain Management

The political dimension of bureaucratic caring is the compass that determines the overall direction of the phenomenon toward or away from caring. The primary influences of the political dimension, the prescriber, parent, patient and nurse must be aligned. Keeping with Ray's (1989) original description, the political dimension is hierarchical. Based on study observations, the prescribers and then the parents have the greatest influence, perhaps due to their legal authorities.

The technologic/physiological dimension has been redefined and expanded through this inquiry to include technologies that modify patients' physiological responses in addition to monitoring them. Effective analgesics used to prevent pain and indicators of pain that alert nurses of the need to intervene with analgesics for pain reduction and relief are two of the themes in the adaptation of the technologic/physiological dimension.

In order to effectively use elements of the technologic/physiological dimension, prescribers, parents, pharmacists, patients, and nurses must have appropriate knowledge. Knowledge deficits were minimal, delaying but never preventing caring. Knowledge deficits can be addressed with educational programs; but patients' previous pains hindered caring, and this educational dimension theme can not be modified, only prevented for further patients.

The only theme identified in the spiritual/religious dimension is pain goal. The culture of the organization is one of pain reduction, not pain relief. While some nurses were able to prevent pain, the majority of patients will have previous pain experiences from their post-surgical hospitalizations in this bureaucracy of caring. This culture of pain reduction, may explain why a prescriber thought it was reasonable to recommend waiting an hour for the next prescriber to be available when a child was in pain.

This culture of the organization is also reflected in the social/cultural dimension. As a children's hospital, the patient's developmental age provided direction for care and decision making, empowering children to articulate their pain and pain relief needs. Parent involvement in a family centered care culture, influenced the socially acceptable ways nurses were alerted to patient's pains. Nurses communicated their pain expectations informally to each other during face to face reports when patients' pains were challenging and inconsistent with their expectation; suggesting that formal reporting of challenges with prescribers or concerns about parents' and patients' expectations were unacceptable in this family centered care culture. Nurses also expected parents to chose between ordered analgesics and give analgesics to their children or assist nurses in negotiating medication administration, despite parental resistance.

Ray and colleagues studies suggest that the economic dimension was dominant and a potential barrier to care, but in this study the economic influences were minor. These included travel times, interruptions and delays. The minimal influence of the economic dimension is most likely the result of adequate staffing and principles of fairness and equality in assigning workload. Charge nurses and unit secretaries were key communicators, minimizing individual nurse interruptions and facilitating solutions to reduce delays. Themes in the legal dimension only hindered caring, but perhaps witnessing facilitated patient safety.

The humanistic and bureaucratic dimensions of caring were interrelated, connected and dynamic. Ray's Theory of Bureaucratic Caring tries to explain the work of nurses in clinical practice and factors that effect performance outcomes. In this study 28 influential factors were identified and the culturally acceptable performance outcome of pain reduction defined. The political, technologic/physiological, legal, social/cultural, and spiritual/religious dimensions have been further defined in terms for evaluating pediatric post-surgical pain assessment and management. The interplay of these organizational forces and barriers effected nurses' abilities to facilitate choice and achieve caring.

Ray' developed the formal Theory of Bureaucratic Caring based on literature and supporting theories of chaos, tacit knowledge and complexity science. At the edge of order and chaos is choice. Even though nurses in this study were interviewed to determine their rationale for pain management decisions, their choices were still unclear; for example, consider again the nurse who disagreed with the parents' analgesic decision. Why did this nurse even provide a choice to the parents? Why didn't the nurse make the decision instead, based on the appropriate clinical judgment she articulated to the researcher? She could have merely explained her decision to the parents, just as eloquently, rather than deferring to their decision. Despite this inquiry, there still exists a hidden reality, tacit knowledge, which dictates nurses' choices but eludes researcher observation and subjective reporting by the nurses who act on this knowledge. Consistent with complexity science, phenomena is interconnected and dynamic, and our knowledge, though enhanced by these study observations, remains limited and approximate, our understanding restricted and incomplete.  Therefore, while there is support for the resulting model of pediatric post-surgical pain management, an adaptation of Ray's Theory of Bureaucratic Caring, this model is still considered incomplete, requiring continued research to identify all variables that may affect goal attainment.

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

## 5.1 Conclusions

This study sought to bridge the gap of pediatric nurses' knowledge of pain management principles and translation into clinical practice by describing pediatric nurses' negotiation of the bureaucracy of caring to assess and intervene to relieve or reduce children's acute post-operative pain. This is the first observational study that has explored the complexity of interacting variables that promote or deter nurses from achieving optimal pain management for hospitalized children experiencing acute post-surgical pain in North America. This is also the first study to observe nurses throughout their shift recognizing that nurses' familiarity with their assigned patients and changes in care demands throughout a shift influence pediatric nurses' pain management decisions. Finally, this is the first study to adapt Ray's Theory of Bureaucratic Caring to investigate a clinical problem and clinical practices, specifically focusing on nurses' negotiation of the bureaucracy of caring to manage hospitalized children' acute post-surgical pain.

These study results provide evidence of good pain control for the majority of pediatric post-operative patients. These results were consistent with the nurses' goals that patients' pains be controlled, managed and tolerable. The goals of the nurses were consistent with the goals of the organization. Unlike previous studies that used proxy measures focusing on the amount of analgesics administered to conclude that children were untreated or undertreated for pain, the conclusion in this study that pediatric post-operative patients had good pain control was drawn from outcomes identified during observation of what nurses do in caring for children in pain.

This study successfully bridged the gap of knowledge from what researchers report nurses do based on proxy measures, surveys, chart reviews and interviews to what pediatric nurses really do in clinical practice to negotiate pain management and caring for post-surgical pediatric patients.

A few knowledge deficits were identified; but these knowledge deficits were different than those previously reported in studies using survey instruments. Pediatric nurses' general knowledge and attitudes regarding pain assessment and management were not barriers to controlling pediatric patients' post-surgical pains.

Pediatric nurses do not consistently assess children with developmentally appropriate, valid and reliable pain intensity scales. Nurses relied on parents to alert or confirm that their children were in pain. Physicians tended to order pain medications to be given on an as-needed basis, but some nurses empowered with analgesic prescriptions ordered PRN gave these analgesics on a scheduled basis to prevent and treat children's post-surgical pain. Nurses chose biobehavioral methods to manage children's pain in addition to analgesics, specifically when analgesics were not yet due or to supplement analgesia. It was common for nurses to let parents decide whether or not to intervene for patients' pains and nurses asked parents to choose when more than one analgesic was ordered. Nurses followed through on parents' decisions even when the nurses' disagreed with the decisions. Nurses relied on parent's assistance to intervene with analgesics. Nurses' education level, age, and years of experience did not influence these pain management decisions.

Previous research has suggested that nurses' ability to overcome barriers may influence pain management decisions, implying that pediatric nurses' clinical practice may also reflect the political and cultural climate and structure of individual healthcare institutions. Few patients in this study had challenging pain that was difficult to manage. These few patients had previous experiences with pain from hospitalization and surgery or analgesic side effects. These patients experienced pains beyond the patients' and nurses' expectations. Nurses were alerted to these patients' pains by parents' requests or calls for analgesia, crying, and numeric pain scores suggesting severe pain which remained of moderate intensity on reassessment after interventions. Movement and anxiety, as well as, poor communication among the medical staff were contributing factors. This suggests that the individual patients' experiences rather than the organizational culture as a whole may be the most influential reason for suboptimal pain management. Yet, nurses failed to rescue these individual patients from continued pain. The organizational process that seemed to influence this failure to escalate pain management concerns was timing of prescriber's patient care rounds. Nurses waited to notify prescribers of patients' continued pain until prescriber's made patient care rounds. This may reflect the organizational culture, the political dimension, and nurses' failure to effectively negotiate this bureaucracy of caring. To understand factors that contribute to the continued suboptimal management of pain in children, this failure to escalate pain management concerns to prescribers and the hierarchal roles of the political dimension of caring requires further investigation.

## 5.2 Limitations

This study sought to describe what influences nurses' decisions and effectiveness in managing children's post-surgical pain by investigating aspects of the bureaucracy and culture of the care environment. The primary limitation of this study was that findings represent observations during weekday shifts of a single unit at a single Children's hospital reflecting the culture of caring in this particular pediatric post-surgical nursing department. Hence, the findings are not generalizable.

The researcher as observer was also a social participant in the organizational culture. The researcher's observational recordings may have been shaped by the social relationship developed over the observations and time on the unit. To minimize this risk and as a means to remain slightly detached from the observations, the researcher did not assist with patient care.

It is possible that nurses who volunteered to participate in this study had a pre-existing increased awareness of pain management or may have gained this increased awareness as a consequence of the observations and questions. Observed actions may have been influenced by the desire of those observed to achieve allegiance with the researcher. While this may have resulted in increased numbers of pain interventions and decreased time from pain assessments to interventions, other researchers (Manias, 2004; Twycross, 2002) have shown that participants' awareness of being observed decreases significantly during observation periods and the observations for this study were particularly long. While the researcher is a pediatric clinical nurse specialist, board certified in pain management, the researcher was not a staff member at the study site, so the researcher was not in the field continuously and can not be considered a true insider by the study participants.

In an effort to minimize researcher bias and ensure interpretive rigor each nurse participating in the study was sent a summary of the results and offered the opportunity to discuss the research report with the nurse researcher. None of the study participants contacted the researcher. This lack of staff verification of results is therefore another limitation.

There were no observable pain assessments during some of the nurses' initial assessments of patients. These nurses may have been using an appropriate observational tool to assess these patients pain; and therefore, this researcher's documented lack of pain assessment may merely reflect a limitation of this study's methodology. In addition, computer screens were changed on the study unit between the fifth and sixth observation, making observation of nurses computer documentation difficult for the researcher.

## 5.3 Recommendations for Practice

The interplay dynamics of the care dimensions move nurses' actions toward or away from care. Recommendations for practice focus on modifying influences identified as delaying time from pain assessment to intervention, hindering or deterring nurses' actions to provide care (See Table 5.1).

Table 5.1 Recommendations for Practice Focusing on Hindering Influences

| Care Dimension | Hindering influences | Practice Recommendations |
|---|---|---|
| **Political** | 1. **Analgesics not available**<br>2. **Prompted assessments**<br>3. **Nurses' decisions** to use leading comments<br>4. Delaying **consults** until prescribers are on the nursing unit | 1. Assure comfort prior to transfer and change transfer process to assure that analgesic orders have been verified and are available before patients are transferred to the next level of care.<br>2. Take analgesic interventions to patient rooms when analgesics are requested to prevent the delay of making two trips.<br>3. Educate nurses to use validated pain scale scripts to reassess patients for pain after interventions.<br>4. Escalate pain management efforts and seek prescriber consultation when pain remains moderate to severe on reassessment. Do not wait for the prescriber to make patient care rounds. |
| **Economic** | 1. **Interruptions and Delays**<br>2. **Travel for analgesics**<br>3. **Gather liquids** to take oral analgesics. | 1. Consolidate computer documentation of controlled substances into one system. Assure availability of computer terminals.<br>2. Store analgesics on rolling carts or in patient rooms.<br>3. Delegate assuring liquids are at the bedside to an assistive care provider or provide extras with meals and snacks delivered by dietary personnel. |

Table 5.1- *Continued*

| | | |
|---|---|---|
| **Technologic / physiological** | 1. Use of **numbers scale** to guide interventions<br>2. Movement as a **biobehavioral intervention**<br>3. **Analgesics:** acetaminophen limit<br>4. **Analgesic side effects:** nausea | 1. Escalate pain management efforts and seek prescriber consultation when pain remains moderate to severe on reassessment.<br>2. Repositioning is not recommended as a comfort intervention after orthopedic or abdominal surgery.<br>3. Do not order both acetaminophen and a combination opioid with acetaminophen product for the same patient. Instead, prescribe acetaminophen and a single opioid like oxycodone PRN pain.<br>4. Do not delay oral opioid analgesic administration until patients have eaten. |
| **Legal** | **No analgesic orders** | Add an analgesic from another class of medications (supplementing with another mechanism of action) and reduce intervals between analgesics when analgesics do not provide pain relief for the entire interval between doses. |
| **Spiritual/ religious** | **Pain Goal** | Seek pain relief. Reserve the goal of reducing pain for patients with challenging pain, such as those with previous pain experiences. |
| **Social/Cultural** | 1. **Assessment timing**<br>2. **Negotiating giving oral analgesics** | 1. Organize initial assessment of patients to first attend to those who have not received analgesics during the previous eight hours.<br>2. Develop or assure availability of palatable analgesics. Use pills in place of liquids, elixirs and suspensions for patients who can swallow pills. |

Table 5.1- *Continued*

| | | |
|---|---|---|
| **Educational** | **Knowledge deficits** | • Make available a reference with recommended doses and equianalgesic dosing.<br>• Educate regarding opioid molecular structure, differentiating adverse reactions from allergic reactions, and the treatment of opioid-related pruritis.<br>• Standardize intravenous opioid administration procedures.<br>• Add a pediatric clinical nurse specialist with pain management expertise and prescriptive authority to the pain management team to focus on assisting nurses to negotiate knowledge, social/cultural, and political dimensions, develop resources and act as a "just in time" resource consultant. |

The political dimension of care includes role stratification and division of labor, power, decision making, communication patterns, regulatory influences, and distribution of resources within an organization (Ray, 1989). Political aspects that hindered care were not having analgesics available, prompted pain assessments, nurses' decisions to use leading comments, and delays in obtaining consults.

The transition of patients to different levels of care hindered pain management. The process for transferring patients to the post-operative nursing unit required the verification of medication orders by a pharmacist, entry into both the electronic medication administration record and the automated medication dispensing system, and then availability of medications. Until orders were verified and available, nurses could not intervene for patients in pain. Half of the patients were uncomfortable and required intervention for pain when admitted to the post-surgical care unit. Since the care tranisition process has built in delays, it is recommended that nurses assure patient comfort prior to transfer or change the transfer process to assure that analgesic orders have been verified and are available both on the unit and in the computer system before patients are transferred to the next level of care.

Role stratrification and the power hierarchy observed support the parents', grandmothers' and patients' decision-making authority to intervene with analgesics when requested. Nurses assessed patients in response to the calls for pain medications on six occasions, but never more than once per patient. Nurses intervened with analgesics whenever they were requested as long as it was time to provide the next dose of an ordered analgesic. While time to travel to assess a patient to confirm the need for an intervention only added 12 to 13 sec to the alert to intervention time, this confirmation assessment did not alter the nurses' responsiveness to the analgesic request. Deferring to these analgesic requests and eliminating the confirmation assessment will reduce intervention time and is an influence consistent with this political dimension. It is recommended that nurses take analgesic interventions to the patients' rooms when requested, to prevent the delay of making two trips.

Nurses had a tendency to use leading comments or suggestions when assessing and reassessing patients' pains. Seven nurses made twelve leading comments or suggestions. These comments encouraged patients to report minimal pain, "How's your pain now, is it gone, like a 0, or a little bit like a one or a two?" One nurse even seemed to recognize this tendency to script the patient's response, "But you aren't hurting – I'm not trying to put words in your mouth." Open communication is a fundamental assessment skill. It is recommended that open communication techniques be used to reassess patients for pain. The most frequently used pain assessment tool was the numbers pain scale; but nurses rarely defined the scale anchors, suggesting that each individual nurse, patient and parent's understanding of the meaning of responses on the pain scale may be different. It is recommended that the anchors of the numbers pain scale be defined and the use of the numbers pain scale be scripted to assure consistency in communication and promote a common understanding.

The final theme identified as fitting with the political dimension for hindering care is consultation. There were unfortunately observations when patients' pains were not well controlled, yet, nurses chose not to advocate and escalate the child's pain management decisions to a charge nurse or prescriber. Consultation with physician assistants, surgeons, and the pain management team usually waited until these prescribers were on the nursing unit making patient rounds. Six nurses commented in post-shift interviews that having correct analgesics ordered and available facilitated achieving their pain management goals for their patients. Nurses need to use their power to assure the correct analagesics are ordered and available by escalating their pain management efforts and seeking prescriber consultation to titrate doses when pain remains moderate to severe on reassessment. Nurses should not wait for prescribers to make patient care rounds. Waiting resulted in escalation of patients' pains.

The economic dimension of bureaucratic caring emphasizes workload and staffing. There was little variance in staffing and direct care time during the 14 shift observations. Tasks that pull nurses away from direct patient care, however, influence nurses' responsiveness to children's acute postoperative pain. Changes in processes and opportunities for delegation may decrease nurses' time away from patients. Three themes which hindered prompt alert to intervention intervals were identified as economic influences: delays, travel for analgesics, and gathering of food and liquids.

Delays were related to waiting in line for the medication room computer and the automated dispensing system. Other delays related to the computer system included two password problems and a nurse leaving before completing the co-sign procedure of the automated dispensing system. Nurses were required by policy and law to co-sign the removal and discard of controlled substances. Nurses typically signed into the electronic medication administration record or the automated medication dispensing machine and then called only once for a co-signer. The co-signer would then sign into the other system. It is recommended that these systems be consolidated into one system. This would eliminate the delay currently built into this process which requires nurses to double document every controlled substance administration. The availability of an adequate number of computer terminals to prevent delays should also be assured.

The second economic dimension hindrance was time to travel to the centralized medication room to retrieve analgesics. Travel times ranged from 6 to 80 sec for a mean of 34 sec. Differences in travel times reflect distance from the patient room and the medication room. While these times may seem short, of the 58 pain assessment to pain interventions with PRN analgesics or biobehavioral intervention cases, pediatric Registered Nurses intervened with analgesics 43 times. Analgesics could be stored on rolling carts or in patient rooms to minimize travel for analgesics.

The third theme categorized in the economic dimension was the gathering of liquids and foods to facilitate patients taking oral analgesics. The administration of oral analgesics required the availability of liquids to wash down the medication. Sometimes the patients had drinks available in their rooms, but nurses had to retrieve drinks 14 times. Nurses also gather crackers, graham crackers, cups and straws. This time delay was eliminated by patients having food, drinks, cups, and straws available at their bedside. It is recommended that assuring availablility of these items at the bedside be delegated to assistive care providers or extras be provided with meals and snacks delivered by dietary.

This study expanded the scope of the technologic/physiological dimension from equipment to maintain physiological functions to include patient status and interventions which alter physiological functions. Four themes were identified which hindered pain management: use of the numbers scale to guide interventions, movement as a biobehaviroal intervention, acetaminophen limits, and the analgesic side effect of nausea.

In keeping with Ray’s (1989) original definition of this dimension, the appropriate use of pain assessment tools to optimize pain control and monitor the patient’s response to analgesics fits the technologic/physiological dimension of care. While the number’s pain scale is subjective, it is used as a measure of patients' physical pain, both before and after interventions. Interventions were provided for pain scores which ranged from 0 to 9 with a mean of 6. Interventions did not follow pain scores which ranged from 0 to 8 with a mean of 3.2. Nurses' use of discrete numbers on the scale to guide their intervention decisions hindered pain management. Pain scores did not always indicate that the patient was comfortable. As previously recommended, nurses should escalate pain management efforts and seek prescriber consultation to titrate doses when pain remains moderate to severe on reassessment.

Movement was the most common contributing factor aggravating pain after orthopedic and abdominal surgeries. All but three patients who received biobehavioral interventions also received analgesics. Biobehavioral interventions were usually given when it was not time for the next dose of an analgesic. Repositioning always increased orthopedic patient's complaints of pain, therefore it is not recommended as a comfort intervention.

The daily maximum of acetaminophen and the potential for acetaminophen overdose were issues that presented to 11 of the 14 nurses observed. Six post-operative patients had both acetaminophen and another combination acetaminophen analgesic ordered PRN. This hindered the patient's pain management. Nurses warned of the challenge of negotiating the acetaminophen limit when deciding between two analgesics, both containing acetaminophen. It is recommended that acetaminophen and combination opioid with acetaminophen products not be ordered for the same patients. Rather than prescribing acetaminophen and acetaminophen with hydrocodone PRN, prescribe acetaminophen on a scheduled basis and an opioid like oxycodone PRN pain.

The most common side effect nurses negotiated was nausea and the potential for nausea from oral opioid analgesics. Efforts to prevent nausea hindered care. The medication administration record had a note "take with food to avoid GI upset" for all ordered oral opioid containing analgesic. Six of the seven nurses with over three years of experience required patients to eat prior to administering an oral opioid containing analgesic. Experienced nurses even delayed analgesic administration until patients had eaten. Nausea from opioids, however, is related to their central mechanism of action, not a local effect. There is no evidence that taking food with oral opioids will “avoid GI upset.” Only four patients actually reported nausea during the shift observed. All but one ate before receiving an analgesic. No patients vomited during observations. It is recommended that opioid-related nausea and vomiting, whether from oral or intravenous formulations, be treated with centrally acting antiemetics, like Ondansetron (Zofran) (American Pain Society, 1999). There is no evidence to support delaying oral opioid analgesic administration until patients have eaten.

Lack of analgesic orders, either because pain medications were not ordered or the ordered interval between analgesic doses had not been reached were identified as fitting the legal dimension of the Bureaucracy of caring. Seven post-surgical patients did not have analgesics ordered; and two nurses delayed medication administration 30 to 40 minutes until the next dose was due. One nurse consulted a prescriber when a patient was in pain and all ordered analgesic options had been exhausted. Another nurse did not intervene twice because analgesics were not due. Adding an analgesic from another class of medications (supplementing with another mechanism of action) and reducing intervals between analgesics is recommended when analgesics do not provide pain relief for the entire interval between doses.

Nurses’ goals for pain reduction or relief were the only theme categorized in the spiritual/religious dimension. Nurses’ goals hindered caring. Only one nurse’s goal was to make sure her patients were pain-free. She did not have any patients in pain during her shift. All other nurses’ goals were consistent with the hospital’s “Pain” education sheet which clarifies, “while all pain cannot be stopped, almost all pain can be reduced (CCHCS: Pain, May 2006).” Nurses used the words comfortable, tolerable, controlled and manageable when stating their pain goals. Yet, there were several post-surgical patients who were pain-free. It is recommended that nurses and the institution raise the bar and try to achieve complete pain relief for pediatric post-surgical patients. Nurses and the institution should reserve the goal of reducing pain for patients with more challenging pain, such as those with previous pain experiences.

Timing of pain assessments reflects professional and social norms and therefore was categorized to the social/cultural dimension of caring. Most nurses completed their initial patient assessments by 8 o'clock. Five patients were in pain when initially assessed or before assessed by one of the 11 nurses who assessed patients early. Whereas, four of the patients cared for by one of the three nurses who started their initial assessments after 8 o'clock were in pain at or before the time of the assessment. Therefore early initial assessment of patients is recommended to facilitate pain management. Results suggest that nurses should organize their initial assessments to first attend to patients who have not received analgesics during the previous eight hours.

The social/cultural dimension also involves the social skills of negotiation. Pediatric nurses negotiated giving oral analgesics to infants and children, getting the analgesics in the patients, coaching and rewarding the patient for allowing pain relief interventions. Ten different nurses negotiated the administration of analgesics with 17 patients and their parents. Much of the negotiation focused on masking the taste of the analgesics. At least three nurses mixed Lortab elixir with Syrpalta, others tried to mask the taste with strong juices. Patients who could swallow pills usually did so in five sec, whereas children who were resistant to take oral analgesics added 5 to 460 sec to the alert to intervention interval. It is recommended that more palatable formulations of analgesics be made available or mixed in pharmacy for ready administration. Use of pills in place of liquids, elixirs and suspensions are also recommended.

Educational aspects of acute pediatric pain management requires an understanding and ability to educate others regarding appropriate knowledge and attitudes to achieve pain control, such as resolving concerns about analgesics or the need to be strong in times of adversity. Knowledge of patients, families, nurses, and clinicians should reflect the state of the science and the art of caring.

Knowledge deficits were rare, but nurses, physician assistants, and pharmacists were uncomfortable with adult dosing of analgesics and appeared to be unfamiliar with equianalgesic dosing. It is recommended that an education reference for nurses, physician assistants, and pharmacists with recommended dosing and equianalgesic dosing be provided as an insert in the chart, on the computer or as a pocket guide. A more common knowledge deficit related to differentiating adverse reactions from allergies to opioids. Education regarding opioid molecular structure, differentiating adverse reactions from allergic reactions, and the treatment of opioid-related pruritis is recommended for nurses and pharmacists.

Consultations from other nurses were related to analgesic administration. IV opioid analgesics were given over 98 to 974 seconds for a mean nursing time of 451 seconds. Some nurses first diluted the opioid analgesics in the medication room. Nurses then either gave the analgesic by slow and steady push, by intermittent push, or by syringe pump. Variance in IV push techniques may have led to one patient's "light-headedness," another patient's feeling "loopy," and another patient's complaint of chest tightness. It is recommended that more dilute intravenous opioids be available in the automated dispensing machine. This would reduce time, contamination and potential error in diluting opioid analgesics. It is also recommended that intravenous opioid administration procedures be standardized, promoting safety and efficacy.

Current pain management nurses provide support for the anesthesia pain management team and do not have prescriptive authority. It is recommended that the hospital add a pediatric clinical nurse specialist with pain management expertise and prescriptive authority. This individual could focus on instituting the previous recommendations, assisting nurses to negotiate knowledge, social/cultural, and political dimensions, develop resources and act as a "just in time" resource consultant.

## 5.4 Recommendations for Further Research

Overall, pediatric post-surgical patients' pains were managed, controlled, and considered tolerable. This study provided insight into individual nurses' clinical practices and decision making, as well as the organization's culture and systems and how nurses negotiated this bureaucracy of caring to achieve pain management goals.

Previous research suggested that nurses who chose the goal of pain relief would provide more analgesics than nurses who did not express pain relief as their pain management goal. Results of the current study add to our knowledge of actual practice, but more research is needed. **Pediatric nurses observed actions need to be compared based on their goals of pain relief versus pain reduction.** No comparison was possible in this study due to the uniformity of the nurses' goals and their consistency with the hospital's pain management goal of pain reduction, rather than pain relief. **Opportunities to verify the influence of organizational culture over nurses' personal values are needed to further our knowledge of these influences.**

Nurses' knowledge regarding titration of opioid analgesics can be tested with items from the Pediatric Nurses' Knowledge and Attitude Survey Regarding Pain. Previous assessments of nurses' knowledge and attitudes have identified titration of opioids and escalation of pain management interventions as a knowledge deficit, but previous assessments of nurses' knowledge and attitudes fail to completely explain forces that promote or deter nurses from intervening to relieve children's acute pain. In this study, patients had good pain control despite the rare analgesic knowledge deficits of nurses, physician assistants, and pharmacists. Yet, nurses did not contact prescribers for pain reduced but not relieved by current analgesic orders. **Future research could clarify and differentiate whether failure to escalate pain management is influenced by nurses lack of knowledge regarding opioid titration or the political dimension of the bureaucracy of caring.** One way to approach this inquiry is to determine nurses' knowledge of opioid titration by analyzing their responses to select questions on the Pediatric Nurses' Knowledge and Attitude Survey Regarding Pain and comparing these results to nurses' observed actions caring for patients whose pain is reduced but not relieved with ordered interventions. If nurses tested knowledge indicated an understanding of opioid titration, but these nurses still failed to escalate pain management concerns to prescribers when patients' pains were reduced but not relieved with ordered interventions; then this would suggest the political dimension of the bureaucracy of caring rather than knowledge regulated practice.

Consults were only requested from physician assistants and the medical staff when they were on the nursing unit making rounds. While physician assistants rounded in the morning and then again in the afternoon, the timing of other physician and surgeon's rounds were unpredictable. **More research is needed to determine why nurses are resistant to consult prescribers when they are not physically on the nursing unit. This research may further define the hierarchal roles and communication patterns of the political dimension of the Theory of Bureaucratic Caring.**

Results of this study update our knowledge of parents' influence on nurses' pain management practices. Results of this study and those of previous research have described the roles of nurses and parents' in the management of children's acute post-operative pain (Woodgate & Kristjanson, 1996a; Gimbler-Berglund, Ljusegren, & Enskar, 2008). **More research is needed to further define the hierarchy and dynamics of these roles.**

This is the first study to describe how nurses request pediatric patients' to decide whether or not they require an analgesic intervention for pain. The majority of decisions were made by children who had no previous experience with surgery or hospitalization. These patients ranged in age from 6 to 16 years. **Additional research is needed to verify these results. More research is also required to determine the developmental skills patients need to make appropriate pain management decisions and patient's position of hierarchy in the bureaucracy or caring.**

Children's previous experience with pain hindered nurses' efforts to reduce pediatric post-surgical patients' pains. While previous research suggested that it is not just the past exposure to pain that affects a child's subsequent response; but that fear and anxiety may intensify the perception of pain, especially if previous experiences have been negative (McGrath & Hillier, 2003; Rocha, Prkachi, Beaumont, Hardy & Zumbo, 2003). Yet, at least one patient in this study reported better pain control during previous experiences. **More research is needed to clarify the relationship of children's previous pain experiences and their influence on patients' subsequent post-surgical pain experiences.**

Witnessing controlled substance administration is required by law to prevent diversion. **Further research is needed to assure that witnessing increases safety of controlled substances administration and actually prevents diversion.**

There is no evidence that taking food with oral opioids will "avoid GI upset." **However, strong opinions from experienced clinicians certainly support the need for more research to determine the effectiveness of having patients eat prior to administering oral analgesics to reduce opioid-related nausea and vomiting.**

The primary limitation of this study is that findings represent observations during weekday shifts at a single free-standing Children's hospital reflecting the culture of caring in this particular pediatric post-surgical nursing department. Hence, the findings are not generalizable. **Replication of this study is recommended to verify results on other pediatric post-surgical nursing units.**

In preparation for this dissertation study, a pilot study was conducted. The purpose of the pilot study was to test the feasibility of using ethnography and human factors engineering to collect and quantify observations to describe factors that influence nurses' actions to relieve children's acute post-operative pain on a pediatric post-surgical care unit. The pilot study sampling plan had the researcher purposively shadow one nurse at a time for an entire shift, one day shift and one night shift for each day of the week. **Comparison of data from the pilot study and current study is recommended to further define and verify the specific care dimensions and to determine how differences in organizational cultures impact the**

**interplay of the dimensions of the bureaucracy of caring and influence time from pain assessment to intervention on pediatric post surgical care units.**

This study defined the seven dimensions of the bureaucracy of caring in relation to the management of children's post-operative pain on a pediatric post-surgical unit. The previous definitions of the political and economic dimensions of caring were refined and modified to reflect clinical practices. The technological/physiological dimension was expanded to include patients' physiologic status and interventions which effect patients' physiologic status. The spiritual/religious dimension requires further definition through additional scientific inquiry. **More research is needed to further define the specific care dimensions of the bureaucracy of caring and the fit of this theory for other clinical practice issues. The Theory of Bureaucratic Caring provides a unique perspective to investigate the complex phenomenon of acute care delivery.**

## APPENDIX A

## POST-INTERVENTION & POST-SHIFT INTERVIEW QUESTIONS

*Post-intervention interview questions*

Tell me what influenced you in treating the patient's pain

*Post-shift interview questions*

1) What were your care priorities?

Did they change during the shift and why?

2) What was your pain management goal?

Were you able to achieve that goal?

What helped you?

What hindered you?

APPENDIX B

NURSES DEMOGRAPHIC INFORMATION FORM

*Nurses Demographic Information Form*

Nurse's age (years) Date: - -20 MM-DD-YYYY

Ethnicity/Race: $_1$White or $_2$Black or $_3$Asian or $_4$Hispanic or $_5$Pacific Islander or $_6$More than one Race $_7$Unknown

<u>Academic preparation:</u>

Entry into practice: $_1$LVN or $_2$Diploma or $_3$ADN or $_4$BSN or $_5$MS

Highest degree: $_2$Diploma or $_3$ADN or $_4$BSN

Years of nursing experience Years of Pediatric nursing experience

Years employed on the pediatric post-surgical care unit

Number of days worked in a row prior to shift OR Number of days off prior to shift

<u>Workload</u>

At start of shift Number of patients Number of Nurses

Number of techs Number of Unit Secretaries Charge nurse patientless $_1$Yes $_2$No

At end of shift Number of patients Number of Nurses

*Workload (other care non-patient care assignments)*

# APPENDIX C

# PATIENT DEMOGRAPHIC INFORMATION, PATIENT ACUTIY, AND LOCATION FORM

*Patient Demographic Information and Location Form*

Patient Room #: ☐☐☐-☐ Date: ☐☐-☐☐-20☐☐ MM-DD-YYYY

Patient age ☐ ☐☐☐ (years) ☐☐☐ (months)

Gender: ☐1Male or ☐2Female

Ethnicity/Race: ☐1White or ☐2Black or ☐3Asian or ☐4Hispanic or ☐5Pacific Islander or ☐6More than one Race ☐7Unknown

Diagnosis:______________________________________________________________

Post-operative day (Date minus operative date) ☐☐☐☐ ☐

Length of stay (Date minus admission date) ☐☐☐☐ (*should be ≥ post-operative day*)

Previously cared for by this nurse ☐1Yes or ☐2No

Parent present ☐1Yes or ☐2No or ☐3Sometimes (see field notes for details)

Patient Room #: ☐☐☐-☐ Date: ☐☐-☐☐-20☐☐ MM-DD-YYYY

Patient age ☐ ☐☐☐ (years) ☐☐☐ (months)

Gender: ☐1Male or ☐2Female

Ethnicity/Race: ☐1White or ☐2Black or ☐3Asian or ☐4Hispanic or ☐5Pacific Islander or ☐6More than one Race ☐7Unknown

Diagnosis:______________________________________________________________

Post-operative day (Date minus operative date) ☐☐☐☐ ☐

Length of stay (Date minus admission date) ☐☐☐☐ (*should be ≥ post-operative day*)

Previously cared for by this nurse ☐1Yes or ☐2No

Parent present ☐1Yes or ☐2No or ☐3Sometimes (see field notes for details)

APPENDIX D

CONSENT FORM

CookChildren's

# Minimal Risk Research Consent and Authorization Form

**Title of Research:** Pediatric Nurses' Journeys Providing Postoperative Care
**CCHCS Department:** Nursing
**Research Team:**
Renee Manworren, PhD (c), RN & Andrea Smith, PhD, RN, CPNP

**Telephone #:** 214-336-8304

## Why is this study being done?

This is an invitation to participate in a research study of nursing care of post-surgical patients. The Researchers wish to learn more about nurses' clinical care and factors that influence their care of post-surgical patients during a routine 12-hour shift. The purpose of this study is to describe factors that influence nurses' actions to relieve children's acute post-operative pain on a pediatric post-surgical care unit.

The research involves the following:

- The researcher will shadow one nurse at a time for an entire 12 hour shift.
- Nurses may be observed for more than one shift.
- Observations and interviews will be conducted until additional observations fail to provide new information or no longer change the analysis.

The Researchers wish to enroll up to 33 nurses in this research study, and all will be from this location.

## What will happen in this study?

After signing the consent form, the procedures associated with this research include the following:

- You will be asked to provide your age, gender, ethnicity, academic preparation, years of nursing experience, years of pediatric nursing experience, and years working on the pediatric post-surgical care unit, and days worked or off prior to observation. You will record this information on a nurse information form at the time of the shift observation. To assure confidentiality of your information, you will not be identified in any other way and only group data will be reported.
- You will be observed during a 12-hour clinical shift while providing care to patients on the pediatric post-surgical nursing unit. Observations related to assessment and management of pain will be conducted.

- A stop watch will be used to map your time during patient care. Time, location, assessments, interventions including medication administrations, reassessments, interruptions of care and will be documented in the researcher's field notes during the observation.
- You will be interviewed and asked to share their thoughts and clarify your actions after interventions and after the shift to glean insight into your decision-making processes and specific influences or difficulties encountered which may have affected the your care decisions.

## How long will I be in this study?

Your participation will last for an entire 12 hour shift. The researcher may ask to follow you for additional shifts. You can choose to stop participating in this study for any reason at any time.

## Are there any risks associated with taking part in this study?

There is always a risk of loss of confidentiality associated with participating in a research study. All information pertaining to your participation in this research will be kept in a locked file cabinet in the Center for Nursing Scholarship and Technology at University of Texas at Arlington. The researchers involved in this study will take every precaution necessary to ensure that your privacy is protected.

## Are there any benefits?

The benefits of participating in this study include the following:
- You may or may not receive any direct benefit from participating in this research study.
- It is possible that the information learned from this research study could help researchers learn more about clinical care and factors that influence care of the post-surgical pediatric patients during routine 12-hour shifts.

## What are the alternatives to taking part in this study?

You can choose not to participate in this research. You can withdraw from the study at any time. Refusing to participate or withdrawing from this study will involve no penalty or loss of benefits to which you are otherwise entitled.

## Are there any costs associated with taking part in this study?

There are no costs associated with this study and you will not be paid for participating.

It is unlikely that you will be injured as a result of taking part in this study. However, if you are, Cook Children's Health Care System has not set aside any funds to compensate (pay) you in case you are injured as a result of taking part in the study.

## Will my records be kept confidential?

Please note that if the nurse researcher observes a dangerous, illegal, or unethical practice toward any patient, the practice will require reporting consistent with all nursing state and federal regulations.

The Health Insurance Portability and Accountability Act (HIPAA) limits the use and disclosure (sharing) of your private Protected Health Information (PHI). PHI includes any information about your physical or mental health, your health care, or payment for your health care. Among other information, PHI may include your:

- Gender
- Race/Ethnicity

## Who will receive my information?

If you give permission, the researchers may use or share your private information (PHI) for the research described above.

CCHCS will try to protect your private information. However, an absolute guarantee is not possible. For example, the law may require that certain information be given to the courts or the health department.

Depending on the study, your private information (PHI) may be shared with several groups, including inspectors who check the research, and government agencies. These could include:

- The CCHCS and University of Texas at Arlington Institutional Review Boards (IRBs) – designated teams of people who ensure that the rights of research participants are respected
- The CCHCS Legal and Compliance Departments
- The Federal Office for Human Research Protections (OHRP)

The researchers will report their findings in scientific journals or meetings, but they will not identify you in their reports. The researchers will try to keep your information confidential, but this cannot be guaranteed. The government does not require everyone who might see or receive your information to keep it confidential, so it might not remain private.

## What else should I know?

- The choice to give permission (authorization) for CCHCS researchers to use or share (disclose) your private information (PHI) is voluntary. No one can force you to give permission. However, you must give permission if you want to be in the research.
- CCHCS will keep all patient information private in accordance with Federal law. However, once your information has been shared, CCHCS cannot guarantee that it will remain protected.
- By signing this form, you are allowing CCHCS and the research team led by the Principal Investigators, Renee Manworren, PhD(c), RN and Andrea Smith, PhD, RN, CPNP to use and/or disclose your PHI for the purposes of the research.

## Can I cancel my permission?

- You have the right at any time to cancel (withdraw) permission for the researchers to use or share you private information (PHI).
- To cancel permission, you must write to the Principal Investigator or the CCHCS Privacy Officer, David Lancaster, at 801 Seventh Avenue, Fort Worth, TX, 76104.
- If you cancel permission, you can no longer be in this research study. You should discuss this with the research team.

## How long can my information be used or shared?

- Unless you cancel your permission in writing, the CCHCS researchers can continue to use or share your information indefinitely.
- If you cancel permission, information that was already used or shared (disclosed) before you withdrew will not be affected. However, the researchers cannot use your information for anything new, and cannot share it any more .

## What are my rights as a research participant?

You have the right to find out about the release of your Protected Health Information (PHI). You have the right to withdraw your participation in the research at any and all levels at any time. You have the right to have all your questions and concerns addressed and answered to the best of our ability.

You have the right to any new information that becomes available during your participation in this research that may affect your willingness to continue in the research.

## What are my responsibilities as a research participant?

It is your responsibility to do the following:
- Ask questions about anything you do not understand.
- Keep appointments.

## Who do I call if I have questions about this study?

If you have questions regarding your participation in this study, please contact Renee Manworren, PhD (c), RN at 214-336-8304 or Dr. Andrea Smith, PhD, RN, CPNP at 682-885- 3383 .

## Who do I call if I have questions about my rights as a research participant?

If you have questions regarding rights as a research participant, you can contact the Cook Children's Health Care System Institutional Review Board Chairperson at 685-885-1764.

## STATEMENT OF CONSENT and AUTHORIZATION

Your signature below means that you want (consent) to take part in this research. It also means that you give permission for (authorize) the CCHCS researchers to use and share (disclose) any of your Protected Health Information (PHI) that is related to this research.

You should not sign this form until you have had the opportunity to read it (or have it read to you) and have all your questions and concerns answered. You should not sign this form unless you have made a free and voluntary choice to be in the research and to give permission for your PHI to be used and shared.

Participating in the research and giving permission for CCHCS researchers to use and share your PHI are voluntary. Refusing to participate or to give your permission will not result in any loss of benefits to which you are otherwise entitled.

You may withdraw from the research or cancel permission for your PHI to be used or shared at any time. Withdrawing from the research or canceling your permission will not result in any loss of benefits to which you are otherwise entitled.

Your signature below means:

- You have read the information above (or it has been read to you)
- You have received answers to your questions at this time
- You have freely decided to participate in this research
- You have freely given permission for CCHCS researchers to use or share your Protected Health Information for the purposes of this research.
- You are not giving up any of your legal rights.

You will be given a copy of this consent form to keep.

## Signatures

Printed name_______________________________________________________

And Signature__________________________Date__________________

Printed name_______________________________________________________

And Signature__________________________Date__________________
of person obtaining consent

Printed
name_________________________________________________________

And Signature__________________________Date___________________
of witness

☐ Use of witness applicable ☒Use of witness not applicable

***Please note that the signature of the witness indicates that this person is an impartial third party and observed the consent process (which included the discussion between the Investigator(s) and the participant) as well as the signature of the participant. <u>Please note that a witness must be present when consent is obtained from a Non-English speaker or if the participant is illiterate. Otherwise, a witness to the consent process is not required.</u>**

**NOTE: Informed consent must be obtained in language understandable to the subject. This requires use of either (i) a full, translated informed consent document approved by the CCHCS IRB, or (ii) a translated, IRB-approved "short form" and a translator for the consent process.**

APPENDIX E

CASES OF OPTIMAL PAIN MANAGEMENT AND CHALLENGING PAIN

Cases of optimal pain management:

Five patients reported they had no pain after surgery. Details of the first exemplary case, a15 year old white male 3 days after pectus carnitum repair, can be found in section 4.5. Commonalities of cases and how they differ from cases of challenging pain are also evaluated in section 4.5. In this appendix themes, related dimensions of bureaucratic caring, and details from the care narratives are provided.

*1) 11 year old white male 1 day after insitu pinning of right hip*

This first example of excellent patient pain management follows an **11 year old** white male **one day after** insitu pinning of right hip to discharge (social/cultural & technologic/physiological dimensions). **Initial assessment** clearly indicated he did not have pain, “Are you hurting?" The **patient replied**, "No," (social/cultural dimension). The nurse further clarified, "What **number** would you give it?” The patient responded, "A 0,"(technologic/physiological dimension).

The most common reason nurses gave for **pre-medicating** patients for pain was to get them up and walking whether that was with a nurse or prior to physical therapy (technologic/physiological dimension). This **patient’s experiences** may have reinforced his nurse’s plan to pre-medicate him prior to walking (educational dimension). "He only had one pain," the patient’s **mom** reported (political dimension). The nurse inquired, "What were you doing?” The **patient explained**, “I just moved and it only hurt a little that one time (social/cultural dimension)." Movement was the most common **contributing factor** aggravating pain after orthopedic and abdominal surgeries (technologic/physiological dimension). The nurse advises, "I'm not sure when PT is coming but I think it would be wise to take one of those pain pills with breakfast since it hurt a little when you **moved** and PT is going to have you move even more (technologic/physiological dimension)." **Mom agrees**, "I think that would be OK (political dimension)." The nurse also explains, “I want you to take it with breakfast because that medicine can upset your **stomach** (technologic/physiological dimension). This way it’s working if PT surprises us and if they come later we can give another dose." The **medication administration record** had a note "take with food to avoid GI upset" for all ordered oral opioid containing analgesic (political dimension). This patient’s nurse **planned** analgesic administration to coincide with the patient’s meal (technologic/physiological dimension). The nurse returns with the prescribed Vicodin (5mg/500mg), cracker and juices for the patient to eat since his breakfast has still **not been delivered** (economic dimensions). The patient asks, "Will this make me puke if I don't eat?" The nurse shares her **experiences** (educational dimension), "It doesn’t take much, but anytime I come in and a patient is throwing up it is usually because they had a pain pill at 04:30. It’s not just in the books, I've actually seen it.”

**Knowledge deficits** were rare; but when this nurse enters the automated medication dispensing machine and pulls the patient’s dose of Vicodin, she comments, "Doesn't seem like a lot for a big kid like him." The dose is 5mg of hydrocodone with 500 mg of acetaminophen, consistent with the American Pain Society adult dosing guidelines (educational dimension).

Nurses had a tendency to use **leading comments** or suggestions when assessing and reassessing patients’ pains (political dimension), “What was your pain level when you moved that one instance?” The patient responded, “Like a Wow!” The nurse probed further, “Was it like a shocking pain?” The patient disagrees, “More like a dull ache.” “You don’t want to give it a number,” the nurse asked; “If 0 is no pain, I call this the (nurse’s name) scale and a 10 would be like those old Tarzan movies. You know what I mean, maybe like a burn. Have you ever had a bad burn?” The patient simply **replies**, “No (social/cultural dimension).” This patient’s nurse even seemed to recognize this tendency to script the patient’s response, “But you aren’t hurting – I’m not trying to put **words in your mouth** (political dimension).” His **mother** also made a suggestion that may have influenced her son’s self-report of pain, “If he doesn’t need it, I’d rather he not get pain medicine – You aren’t hurting are you (political dimension)?” Her 16 year old **son responds**, “No (social/cultural dimension).” His nurse **communicates her expectations of the patient,** “He's tough. He's just sailed since surgery (social/cultural dimension)." The patient’s **mother** comments, "I wouldn't have (social/cultural dimension)."

*2) 6 year old white female 1 day after extravesical ureteral reimplant*

The second example is also a patient who is discharged one day after surgery. This **seven year old** female's **initial assessment** the **day after** extravesical ureteral reimplant clearly indicated the patients was not in pain (social/cultural & technologic/physiological dimensions). "Is your tummy hurting this morning?" The **patient replied**, "No," (social/cultural dimension). The nurse further clarified, "Any owies at all?" The patient assured the nurse, "No." Later on **reassessment** (social/cultural dimension), "How you doing? Are you hurting?" The **patient nods** (social/cultural dimension). The nurse makes a **leading comment** (political dimension), "Is it a little owie? Let me see if it is time for you to have some medicine." The patient's **mom responds** (political dimension), "You have to take something."

The patient's **previous pain experiences** may have influenced the decisions to intervene (educational dimension). The nurse **explains,** "She can have pain meds, she has Tylenol and Tylenol with codeine. So here is the deal, if we give Tylenol and it doesn't help we need to wait four hours to give Tylenol with Codeine, it's **up to you**," (educational & political dimensions) The **mother** shares her previous experience with her seven year old daughter's pain, "She **won't tell** me. She will wait until she can't anymore to tell us (political & social/cultural dimensions)." This leads the **nurse to decide** on a pain management plan, "Let's give her the Tylenol with Codeine, and then, I need her to walk (political dimension)." **Parents** agreed with the plan (political dimension).

Nurses also relied on **parent's assistance** to intervene with analgesics; but parents of the children two to seven years of age preferred not to administer analgesics (political dimension). This six year old has two oral syringes of analgesic, her nurse asks, "Do you want to take big one first or little one?" The **patient** pushes the nurse away, but her **father** responds, "You know our deal." The father holds he patient's hand and tells nurse to go ahead and push it in (political & social/cultural dimensions).

*3) 14 year old black male 7 days after laparotomy for small bowel obstruction*

The number of times a patient received a pain medication during the previous shift and the time of the last dose was reported during shift report on all except six post-surgical patients, including the next two patient examples. This **14 year old** black male's **initial assessments seven days after** laparotomy for small bowel obstruction indicated the patient had pain, but his pain was not significant enough to alert the nurse to intervene (social/cultural & technologic/physiological dimensions). "How's your belly feeling? Does it hurt when I push on it?" The **patient** replies, "Just the **incision** (social/cultural & technologic/physiological dimensions)." The nurse uses a **leading comment** as she clarifies, "Just sore when I push on it (political dimension)?" The patient agrees, "Yes." This patient was later **discharged** at 13:56 without further intervention or pain assessment (political dimension).

*4) 8 year old Hispanic male 5 days after left thoracotomy and repair of paraesophegeal diaphragmatic hernia*

The last example is an **eight year old** Hispanic male who underwent left thoracotomy and repair of paraesophegeal diaphragmatic hernia **five days** prior to report (social/cultural & technologic/physiological dimensions). "Does he have any pain, delor?" His **mom** answers, "No (political dimension)." The patient **smiles** and **hugs** the nurse 21 minutes later (social/cultural & technological/physiologic dimensions). The patient was assessed every 26 minutes to every 3 hours and 18 minutes, there were no reports or behavioral indications of pain with these routine assessments (technologic/physiological dimension).

Cases of challenging pain:

Six patients' pains were challenging. Details of the first exemplary case, a 9 year old white male patient 3 days after excision physeal bar right femur, can be found in section 4.5. Commonalities of cases and how they differ from cases of optimally controlled pain are also evaluated in section 4.5.

In this appendix themes, related dimensions of bureaucratic caring, and details from the care narratives are provided.

*1) 6 year old white female 1 day after open reduction and internal fixation of her left elbow.*

The first example of challenging pain involved a **six year old** white female who had an open reduction and internal fixation of her left elbow the **previous day** (social/cultural & technologic/physiological dimensions). The nurse observed is informed in **report**, "Only problem she has is thumb, when I asked her to move it she said no it will hurt but she can give it a little **wiggle** (political dimension)." With the first pain assessment, the nurse asks, "Does your fingers or arm hurt at all?" The **patient responds**, "No (social/cultural dimension)." The nurse continues her assessment, "Can you wiggle your fingers?" The patient answers, "I'm too **sleepy** (technologic/physiological dimension)." Her **father** encourages, "Let's give it a try (political dimension)." The patient shares her lack of **previous pain experience**, "My fingers **feel weird** (educational & technologic/physiological dimensions)." The nurse asks, "Is it different since surgery?" The patient responds, "Same, but this is the **first time** I've broken my arm (educational dimension)."

An hour and 20 minutes later, when the resident surgeon manipulates the child's fingers, the previously calm patient **cries**, "**Ow** (technologic/physiological dimension)." **Movement was a common contributing** factor aggravating pain after orthopedic and abdominal surgeries (technologic/physiological dimension).

The resident surgeon expressed a desire to limit the use of opioids for this post-surgical patients, but nurses never voiced similar concerns. At 8:49 resident surgeon **explained**," (She) Can go back to school when not taking any narcotic pain medicine (educational dimension). If she is in that much pain, she probably isn't going to learn anything anyway. Just give her pain meds when **she asks** for it (political dimension). We give you way more narcotics than she'll need (technologic/physiological dimension). She can take **Motrin** or Advil (legal dimension)."

The nurse is ready to intervene **through advanced planning** since it is exactly four hours since her last analgesic dose (technologic/physiological dimension). She offers the **decision** to intervene to the six year old **patient** and her **mother** (political dimension). This was the **youngest patient** asked to decide (social/cultural & political dimensions). At 8:57:46 the nurse informs the patient's mother, "Mom, she had pain med at 4:50, so **she can have more** at anytime (political & technologic/physiological dimension)." The **mom** asks, "Is your arm hurting? (political dimension)." The patient asks, "Do you have that card with **smiley faces**? (technologic/physiological dimension)." The nurse responds, "Yes," and shows the patient the card. The patient points to the second face of the Wong-Baker Faces. The nurse confirms, "So a **2** (technologic/physiological dimension)." The patient agrees, "Yes." The nurse then returns to the original **question**, "Do you think you need some medicine? (political dimension)." The patient then asked, "But can I have the medicine you can eat and drink with?" The nurse clarified, "It will be the medicine you got this morning." The patient responded, "That **made me a little sick** (technologic/physiological dimension)." Her **mother reassured** her, "I think now that you had some sausage you should be OK (social/cultural dimension)."

Earlier the patient had requested a snack, but her **mother had warned**, "Start slow you know what happened yesterday (political dimension)." The nurse assesses, "Did you get **nauseous** (technologic/physiological dimension)?" The **mother** replies, "Yes (political dimension)." The nurse offers, "How about Jello or a popsicle?" Two hours later, just 28 minutes after giving the patient hydrocodone, the nurse reassesses the patient, "How does your tummy feel now?" The **dad** reports, "Not very good (political dimension)." The patient **cries**, "Ow (technologic/physiological dimension)." Her **mother** asks, "What's wrong, you can go ahead and throw up (political dimension)." The **patient responds**, "That was a **bad medicine** you gave me (social/cultural & technologic/physiological dimensions)." The **nurse decides** to intervene, "Let me see if she has Zofran ordered, it's an anti-nausea medicine (political dimension)." When the nurse returns with the Zofran, she asks, "Did we throw up?" The patient's **father** reports, "No, we are hanging in there (political dimension)." The nurse informs, "I have the Zofran." The **patient** cries, "**No**, no medicine (political dimension)." The **nurse explains**, "This doesn't go in your mouth, it goes in your IV (educational dimension)." The patient **cries** (technological/physiological dimension). Her mother **encourages**, "Go ahead and throw up (social/cultural dimension)." The patient states, "I thought you said the medicine wouldn't make me throw up." Her mother apologizes, "I'm sorry; **I thought** it would be better this time (educational dimension)." This patient did not have nausea with the subsequent dose and with just prior to administering the third dose given during the observed nurse's shift, the patient's mom reminded her, "We discussed how medicine did not make us sick last time; it just helped (technologic/physiological & educational dimensions).

**Poor communication among the medical staff** may have hindered this patient's earlier pain management (political dimension). The surgeon instructs the nurse, "Hold discharge for (patient). Resident's a bit overzealous. She's **anxious** and she has a **bad injury** to wrist and thumb (technologic/physiological dimension). We will check her again." The patient's pain and nausea remained a challenge.

This mother is now **unsure** how to intervene; but when mothers were unsure about intervening, they requested nurses' advice and supported nurses when the **decision** to intervene was made (educational & political dimensions). The mother later reported, "Before she fell asleep, she was hurting. Do you know if it is **time** for her to have it? (technologic/physiological dimension)." The **nurse responded**, "Yes, she can have it (political dimension)." The mom asked, "Should I wake her up and have her take it?" The **nurse deferred** to the mother, "It's up to you (political dimension)." The mother referred back to the nurse's expertise, "What would you do, in **your experience** should we wake her? (educational dimension)" The nurse replied, "**I would** (political dimension)." The mother **agreed**, "OK (political dimension)."

The patient, however, was not as supportive, "I don't like that kind it makes my **stomach upset** (technologic/physiological dimension)." This patient's **previous experience** with the analgesic influenced her decision (educational dimension). The nurse asked, "How much lunch did you take?"

The patient replied, "A lot. It will hurt. I want the white one, it doesn't make my stomach upset and this one makes my stomach upset (educational dimension)." The patient **cries and hits** her mother (technologic/physiological dimension). Her mother responds, "You can be **mad at me**, but your arm will hurt and you are going to hurt your IV (social/cultural dimension)." The patient escalates her refusal, "It will hurt me, (crying, screaming,) let go of my arm." Her mom offers her a **choice**, "Do you want just medicine or juice (political dimension)." The patient continues to express her **refusal**, "I'm serious it makes my stomach upset (political dimension)." Her mom responds, "**We are** taking the medicine (political dimension)." The patient screams, "I'm serious!"

Nurse relied on parent's assistance to intervene with analgesics, but parents of the children two to seven years of age preferred not to administer the analgesic. The mom asks the nurse, "**What do you want to do**, do you want me to give it to her? (political dimension)." The nurse agrees, "If you **want to** (political dimension)."

Parents provided or assisted nurses with providing **biobehavioral interventions**, including repositioning patients after orthopedic surgery (technologic/physiological dimension). The mom repositioned her daughter in bed and the patient screams, "Oh, my fingers **hurt** (technologic/physiological dimension)." The nurse asks, "Which fingers?" The **patient retorts**, "The ones with the cast on it, which ones do you think? (social/cultural dimension)" Her mother responds, "**Hey don't** be disrespectful (political dimension)."

At 14:28, the nurse **communicates her pain expectations** in response to the child's refusal to take Lortab, "I just don't think the Tylenol or Motrin is going to cut it (social/cultural dimension). I know (resident surgeon) says we give too many narcotics, **but I think** you need it (educational, political, & technologic/physiological dimensions). The patient responds, "I don't like it." The patient's mother supports the nurse, "I know, **I agree** with the nurse, thank-you (political dimensions)." The patient also **communicated her pain expectation**, "My arm really, really **hurts**! (social/cultural & technologic/physiological dimensions)" Her nurse responds, "That's **why** we gave you that medicine (educational dimension)." The patient elaborates, "I **didn't think** it would hurt this much (educational dimension)!" Less than a half hour later the patient further elaborates in response to the nurse’s **leading question**, “Is your arm fixed? (political dimension)" She responds, "No, **I want it better** and it is still not better (spiritual/religious dimension)."

The nurse suggests another **biobehavioral** intervention, "It probably needs to be a little higher (technologic/physiological dimension)." The patient refuses, "No, it will **hurt** (technologic/physiological dimension)." The nurse **explains**, "Well if it is higher it will hurt less (educational dimension).” The patient counters, “**You said** the medicine would work and it didn't (educational dimension)." The nurse replies, "It hasn't been very long (technologic/physiological dimension)." The patient disagrees, "It's been a long time.” The nurse checks, it has been 43 minutes, "Well, it has been awhile, **can we** raise it up higher? (political dimension)" The patient refuses, "No (political dimension)." Her **mother intervenes**, "You wanted the nurse to move the pillow (political dimension)." The **patient disagrees**, "I didn't want her to move pillow, I didn't say that (political dimension)." The mother supports the nurse’s **expertise**, "Do you think the nurse knows what she is doing? (educational dimension)." The patent **cries** when cast touched and screams as her arm is elevated (technologic/physiological dimension). The patient **screams**, "It's not helping." Her mom **coaches**, "Just **relax**. (social/cultural & technologic/physiological dimensions)" The patient responds, "I can't." The nurse **coaches**, "Just take **deep breathes**," and **distracts** the patient by talking about a friend with a broken leg (social/cultural & technologic/physiological dimensions). The patient calms. The nurse prepares to leave, "Do you want anything?" The patient requests, "Can I have a popsicle?" The nurse once again supports the mother, "If it is OK with **Mom** (political dimension)."

This nurse did **not** generate a **consults** for her patient’s poorly controlled pain (political dimensions). According to the patient’s mother, “he (the attending surgeon) offered for her (the patient) to stay the night and that's what we think **we want to do** (political dimension).” The analgesic and anti-nausea medications ordered, however, were not adjusted.

*2) 15 year old white female 1 day after laparoscopic cholecystectomy*

The second example of a patient with challenging pain also stayed beyond normal discharge expectations and had pain beyond the **nurses' expectations** (educational dimensions). The nurse did consult, but poor **communication amongst the medical staff** was still a hindrance (political dimension).

This nurse was called four times to address the pain of a **15 year old** white female **one day after** laparoscopic cholecystectomy (social/cultural & physiologic/technological dimensions). This nurse was one of the three nurses who did not begin their **initial patient assessment until after eight o'clock** (social/cultural dimension). While addressing one patient's pain at 8:13 she was alerted by **page** to address this patient's pain (social/cultural dimension). This nurse had been **warned by the nurse going off-shift** that both of these patients had challenging pain that had been difficult to control through the night (social/cultural dimension). "Run me ragged with requests for morphine. She said it didn't really help, but her pain was down to a 3. **What does she expect**; she is going to have some pain? (spiritual/religious dimension)"

This nurse was alerted by **pager** to the patient's pain at 8:32, 11:06, 13:04, and 18:01 (social/cultural dimension). As previously mentioned, this nurse responded to the page by completing her **initial assessment** of the patient, "On a scale of 0 to 10, how is your pain? (political dimension)." The patient responded, "Its **8**, it's been hurting on and off all night, it is really hurting right there (points to mid-chest) (technologic/physiological dimension)." The nurse intervened by administering the ordered 6 mg of morphine IV at 8:54.

During morphine administration, the 15 year old explains that her pain after laparoscopic cholecystectomy is **not as well controll**ed as it had been after her appendicovesicostomy surgery or her posterior spinal fusion (educational dimension). As the nurse gives morphine IV, the patient asks how much she is giving. The nurse confirms 6 mg. The patient comments, "Yes, the lower **dose** wasn't working (technologic/physiological dimension)." The nurse explains, "And they are starting another medicine, a non-narcotic, Toradol." The patient adds, "Yes, they started that at 6." The patient's mother comments, "**Usually** they give her something scheduled and Morphine on top, this is worse than her belly surgery (educational dimension)." The nurse tries to **explain**, "Well, you know they shoot gas up to your shoulder (educational dimension)." The patient's mother explains she is aware of the pain after this surgery, since she **personally had this surgery** 15 years ago (educational dimension). The patient shares her **experience** with another surgery, "(She had the) Q-ball for APV surgery and numbed I (educational experience)t."

On reassessment at 9:11, the patient reported her pain was down to a **4 or 5** (technologic/physiological dimension), The nurse suggests the pain will improve with more time, "Well it hasn't been an hour yet." The patient received **morphine** 16 minutes earlier (technologic/physiological dimension). The patient reassures the nurse, "It's **tolerable** (spiritual/religions dimension)." The nurse repeats, "Well it takes a while." The patient's analgesic **order** was for morphine 6 mg IV every 2 hours (legal dimension).

The nurse **consulted** both the physician assistant and the surgeon when they were making separate patient rounds (political dimension). The nurse asks the physician's assistant in the morning if he is going to add an oral analgesics and reviews currently ordered analgesics as morphine and Toradol. The physician's assistant responds, "Toradol works pretty well, it is an NSAID." The nurse suggests, "I wasn't sure if you wanted to start Lortab or Tylenol with Codeine?" The physician assistant explains, "I like Lortab, but the **surgeon** likes Tylenol #3, I appreciate your suggestions (political dimension)."

When called at 11:06:02, the nurse responded by retrieving and preparing another dose of the morphine before going to assess the patient. While giving the morphine IV push at 11:23:51 The nurse **communicated her plan** for future analgesic administration when administering the next dose of morphine, "I'm going to give morphine this time and then next time, I will give - Oh, I don't know what he ordered - Tylenol #3 or Lortab? (educational dimension)." The nurse asks, "Before I started this medicine, what was your pain?" The patient replies, "It was an **8**, I was asleep and her phone went off and made me jump (technologic/physiological dimension)." Her **Mom** qualifies the answer, "We waited about 30-40 minutes (political dimension)." The patient elaborates, "Then I couldn't stand it."

Less than two minutes after receiving the "last dose" of morphine, the patient reports symptoms consistent with **pruritis** and hypnogotic myoclonus (technologic/physiological dimension). With the next dose of scheduled Toradol, the nurse did not assess the patient's pain; but reinforced the analgesic administration **plan**, "Let's do a trial off the Morphine (educational dimension)."

The nurse is challenged to determine an **appropriate** hydrocodone **dose** for this 89 kg patient (educational dimension). In the afternoon, the nurse notes that the physician assistant ordered Lortab 5/500. The patient has been receiving 6 mg of intravenous morphine for pain without sedation or untoward side effects. She shares her thoughts with the researcher that this is not enough **considering** the patient has been receiving morphine every two hours (educational dimension). The nurse pages the physician assistant and **requests** an increased dose to 7.5mg (political dimension). She assures the physicians assistant that she has not yet given 5/500, but "she (the patient) has been on **pain meds before**, they are going to laugh (educational dimension)." While the nurse recognizes the dose is low on the adult dosage range and low for this particular patient, the nurse and physician assistant fail to realize that it is low in comparison to the morphine dose she is requiring. The equianalgesic dose of 6 mg of intravenous morphine is 18 mg of hydrocodone (technologic/physiological dimension).

Even this increased dose was ineffective. While responding to the call for pain medicine at 13:04:40 the nurse explains to the researcher, "I have **never seen** a lap chole with such pain as her (educational dimension). I think she is at a disadvantage since she **can't walk** (technologic/physiological dimension). I'm not saying she is not in pain, but maybe she is mistaking one pain for another. They are **genuine clock watchers**, I tell you (social/cultural dimension)." The nurse administers Vicodin 7.5 mg/500mg at 13:10:39.

The mom and nurse exchange concerns regarding the patient's continued pain, When the nurse reassesses the patient at 14:08, the patient's Mom asks, "When was she given the Vicodin at

1PM?" The nurse clarifies, "Yes, at **1:15** (technologic/physiological dimension)." The Mom explains, "'Cause it is not working, it is making her **sleep**, but when she is sleeping she is moaning and **groaning** (technologic/physiological dimension)." The nurse asks, "Is it possible for her to **sit** up in a chair (technologic/physiological dimension)?" The **Mom** reports, "She was sitting up in bed a while ago (political dimension)." The nurse **explains** her resistance to provide additional analgesia (educational dimension), "I would not feel comfortable giving a dose of morphine **right now**. I can give it to you in 30-45 minutes- closer to 3 (technologic/physiologic dimension). I want to get you what you need but I can't give the narcotics too close together." This may have been due to concerns of respiratory depression, especially considering that the mother reported that the patient was sleeping, but moaning and groaning in her sleep. The mom responds, "And last night they only had her on morphine, **shouldn't she have** had a long medicine and morphine for breakthrough (educational dimension)? Normally she gets 1 to 2 mg morphine, so we thought 6 would knock her out. It just **doesn't seem to be working** (technologic/physiological dimension)." The nurse explains her **previous experience** with pain after this procedure to a patient and parent, "Usually after lap chole they go home the next day (educational dimension). What about a movie or crayons - I'm just thinking some **distraction** (technologic/physiological dimension)." The patient agrees to, "Crayons." The nurse intervenes by **consulting**, "I'll call childlife (political dimension)."

When the physician's assistant makes afternoon rounds, the nurse shares her concerns regarding the patient's continued pain. He suggests the unexpected severity of her pain may be due to **constipation**, **surgical procedure complications**, or **low pain tolerance** (technologic/physiological dimension), "Are Fleet enemas done here?...They say she does that at home and with all the pain meds we are pumping into her, that may be it (educational dimension). It may explain pain or it could be from cautery or gall bladder **perfed** a little on removal…She says only morphine and Toradol help and Vicodin didn't help, but she could have a low pain tolerance too (technologic/physiological dimension)." The nurse suggests, "Have you **spoken** to (surgeon) (political dimension)." The physician assistant replies, "I'm going to text him." This is the only time during the

14 shift observations that a patient's pain tolerance is mentioned as a potential reason for challenging pain

The nurse is not **called again** until 18:01 (social/cultural dimension). She retrieves and administers the **scheduled Toradol** (technologic/physiologic dimension). On assessment, "Ok tell me what your **pain number** is." The patient reports, "It's an 8, 8 1/2 (technologic/physiological dimension)." The nurse responds, "OK."

Twenty minutes before the end of the nurse's shift, the surgeon makes rounds. The nurse again discusses the challenges in managing the patient's pain. The surgeon asks, "I wouldn't put her on Toradol, **who** put her on Toradol (political dimension)?" The nurse replies, "The **doctor** on call (legal dimension)." The patient has received three doses, the first dose at 06:00 (technologic/physiological dimension). The surgeon explains, "I wouldn't have her on Toradol **because of the bleeding** (technologic/physiological dimension. **I** asked to up her morphine (political dimension). Is she getting Lortab or morphine (technologic/physiological dimension)? The nurse replied, "Both." The surgeon may also be concerned of opioid-related respiratory depression, he stated his concern, "Why both?" The nurse **explained**, "She was needing both (educational dimension)." The surgeon shares his concerns, "It's too **unpredictable** one could be peaking and other peaking (educational dimension.)" The nurse reviews the written orders with the surgeon. He asks, "What does this say? The nurse identifies, "That's 8 mg of morphine," and goes on to detail the time the patient received Vicodin and when morphine was given. The surgeon **states**, "She's on Vicodin, morphine and Toradol (technologic/physiological dimension)." The nurse comments, "Well?" The surgeon explains again, "It's just not right. It is too unpredictable. Morphine should be given every 2 hours, not 3 to 4 and Vicodin 5 mg (educational dimension)." The nurse interrupts, "I had him change it to 7.5mg." The surgeon states, "But it should be 10, it is not enough for her size (educational dimension)." Upon leaving the nursing unit, he informed the nurse, ""**I** upped the Morphine and if still having pain they can add back Toradol (legal dimension)."

The night nurse from the previous shift approaches the nurse observed **concerned** to learn how the nurse negotiated decisions to administer analgesics (social /cultural dimension), "Did you have to give a lot of pain med?" The nurse replied, "**Three morphine,** two Toradol and Vicodin, and she **wanted** me to push it at hand (technologic/physiological & social/cultural dimensions)." The night nurse confirmed," She wanted me to do that, **but I** gave it at the next one higher by the pump (political dimension)." This request had not been relayed during the previous shift report, but was obviously a concerning patient request. The nurse observed had negotiated this request by responding in a fashion similar to the previous nurse. "I am going to give it here" (same place as previous nurse)." During this report, the nurses were able to confirm their consistency in analgesic administration decisions. The oncoming night nurse also shares her concerns about the **patient's pain expectations** (educational dimension), "She was saying she was in so much pain, but it didn't help. I tried to explain she is not going to have **no pain** (spiritual/religious dimension). She said this is even **worse** than her pain after back surgery (educational dimension). I think it was the gas and told her to **get up**, but she didn't and she can get up (technologic/physiological dimension)." The observed nurse concurred, "I told them the same thing, but **you can only** push them so much (political dimension)." The night nurse continues, "I **thought** the Toradol would help, but I guess it didn't (educational dimension)." The observed nurse clarified, "Then the Doctor didn't want her on it because she had intra-operative bleeding (political & technologic/physiological dimensions)." The night nurse exclaimed, "Then why did **he order it** (legal dimension)?" The observed nurse responded, "He didn't the **doctor** on call did (political dimension)."

Later during the same nurse's shift, although her **shift** should have **ended**, the nurse is asked by the **night charge nurse** if she cared for this patient today (economic & political dimensions). The night charge nurse states, "When I called the surgeon about Flexiril, she (the patient) said she takes it at home, but didn't tell anyone and doctor (the surgeon) was upset that he **told** PA to write all her home meds (political dimension)." The observed nurse comments, "Communication has been a problem there."

*3) 6 year old white male 1 day after surgery for Chiari malformation,*

A formal system exists for reporting analgesics given and analgesic orders when **patients transition** and other patient care units (political dimension). A **6 year old** white male **one day after** repair of Chiari malformation has two analgesics scheduled, both with **acetaminophen** (social/cultural & technologic/physiological dimensions). This challenges the patient's pain management and the nurse's ability to intervene for his uncontrolled pain.

The patient arrives in obvious pain, holding his head and **crying** (technologic/physiological dimension). At 16:42 the **nurse transferring** the patient from the intensive care unit updates the patient's status. "He hasn't had morphine in 36 hours, **Lortab last** at noon, Tylenol due at 8PM," (political & technologic/physiological dimensions). The **mom** reports, "Lortab has really been **helping** him (political & technologic/physiological dimensions)." The receiving nurse assesses, "Is it your **neck** that hurts or **head** (technologic/physiological dimension)?" The patient's **parents** ask too (political dimension). The patient nods slightly and **cries (**technologic/physiological dimension).. The nurse being observed asks the pediatric intensive care unit nurse, "So when was the last time for Lortab?" She clarifies, "11:50 and his Tylenol was due at 2, but I didn't give it because he can't get **Tylenol** with the Lortab, but he can probably get it again before bedtime (technologic/physiological dimensions). He was really **anxious** before surgery too, his Dad had to pick him up and put him on the OR cart - that's what I got in report (technologic/physiological dimension). "

The observed nurse's lack of confidence in this explanation and an additional challenge to negotiate an analgesic decision is reflected in her comments to the researcher, In reviewing the patient's records, the nurse comments, "Now I have to **wait** for him to get in computer (political dimension). I'm going to check if **parents** think this is just from **moving** him (political & technologic/physiological dimensions)."

Patients' **previous pain experiences** may have influenced decisions to intervene (educational dimension). Previous pain experiences focused on the pain and pain relief of previous surgeries, as well as the pain relief or lack of pain relief with previous analgesics and analgesic doses. The nurse asks, "Was it like this or just worse because we **moved** him (technologic/physiological dimension)." His **dad** replies "He was doing OK with Lortab and that seems to have **worn off** and then with moving him this is the first he's been holding his head (political & technologic/physiological dimensions)."

According to the transferring nurse's report it has been almost 5 hours since the last dose of Lortab was given. When the patient is in the **computer** and the nurse is able to check his medication administration record, she notes, "She just gave him **Motrin** when he came up here, obviously it's **not helping** him enough (political & technologic/physiological dimensions)."

The most common side effect nurses negotiated was **nausea** and the potential for nausea (technologic/physiological dimension). The medication administration record had a note "take with food to avoid GI upset" for all ordered oral opioid containing analgesic (political dimension). The nurse asks, "With Lortab has he done **OK**? Has he had anything to eat (technologic/physiological dimension)?" The patient's **father** responded, "He had lunch (political dimension)." The nurse clarified, "But at lunch time." The patient's father added, "Then he had a cookie." The nurse advises, "We just **want** something in his stomach, the Lortab is better than some (educational dimension)." The **father** informs the nurse, "We have cookies (political dimension)."

The **father** asks 43 minutes after the patient arrives on the nursing unit (political dimension), "When can we get pain medicine?" The nurse's responds reflects her negotiation of both the decision to intervene and the unique challenges of transitioning a patient to different levels of care, "I have it right here." Nurse relied on **parent's assistance** to intervene with analgesics (political dimension). The **father** shares the **patient's previous experience** with the taste of the medication (political & educational dimensions), "He won't like it, so if you have ideas, or we can just give it to him." The nurse asks how they have been giving the patient his Lortab. She asks, "Do you want to do it?" The father replies, "Why don't you?" The father assists the nurse by holding the patient's hands while the nurse and the father force the patient to take the Lortab. "Come on buddy, this is the only one that makes the pain go away." , Further statements by the patient's father, however, suggest that the pain management plan may require additional modifications, “Last night was a rough night."

*4) 16 year old white female 1 day after total thyroidectomy,*

At change of **shift** report, a nurse is informed that her patient has just received Vicodin for pain (political dimension). When the nurse **initially assesses** the patient 32 minute later, "How are you feeling?" A **16 year old** replied **one day after** total thyroidectomy, "Painful (social/cultural & technologic/physiological dimensions)." The nurse clarifies, "Where are you hurting?" The patient points and nurse further clarifies her **throat** (technologic/physiological dimension). The patient’s **mother** adds, "She is having a hard time breathing and swallowing (political dimension)." The nurse asks, “Is she the one they said **just got** something for pain (technologic/physiological dimension)?" **Mom** confirms, “Yes (political dimension)." The nurse responds, “I can see if I can get anything. Any better since the medicine they gave you?” The patient replies, “Not, really." The nurse further assesses the patient’s pain intensity, "Can you give me a number between 1 to 10?” The patient responds, "**7**” (technologic/physiological dimension)."The nurse further assesses, "And before pain medicine?" The patient responds, "**10**” (technologic/physiological dimension). The nurse evaluates and plans to intervene, "So down a little bit, I’ll check if I can get something else.”

The nurse checks the electronic medication administration record to negotiate the patient’s analgesic schedule. She reads, "Morphine if not tolerating diet, Toradol **not due** until 10 and Vicodin given at 6:50 (legal dimension)." She **approaches** the physician assistant, “Room 11 states she's really hurting and her morphine is only if tolerating diet (political dimension).” The physician assistant **agrees**, "Sure whatever, but this is the last dose (legal dimension)." The nurse administers morphine IV 13 minutes later and **informs** the patient and her mother, "I have your morphine, but this is the last dose because we want to send you home today (educational dimension).” When asked 40 minutes later, "How's your pain now, did that morphine help?” The patient reports, “**5**” (technologic/physiological dimension). The nurse concludes, "Good so coming down." At 9:20 the nurse gathered the patient's medication, including her next dose of Toradol; but before giving the dose, she realizes it **isn't due** until 10 o'clock (technologic/physiological dimension). So, the nurse doesn't give the Toradol until 10:26, bundling the Toradol administration with another stat medication administration. The patient was discharged at 13:37 without further assessment, but with a prescription for Lortab every 4 hours.

*5) 16 year old white female 4 days after arthroscopy of her right knee with synovial debridement and lateral release*

There was no report of pain or pain medication administration mentioned in shift report of a **16 year old** white female who had arthroscopy of her right knee with synovial debridement and lateral release **four days prior** to report (political, social, & technologic/physiological dimensions)

Her nurse was paged at 8:35, **before** she had completed her **initial patient assessments,** because of nausea (social/cultural dimension). "Are you still nauseated?" The patient replies, "Yeh, but I can't get anything." The nurse explains, "That's right, your Zofran is scheduled. How's your pain?" The **patient reports**, "It hurts, I thought they were just giving it to me (social/cultural dimension). They woke me up last night. Is it time?" The nurse assesses further, "I'll check, where is your pain level at on a 1 to 10 scale?" The patient replied "**8** (technologic/physiological dimension)." The nurse **informed her**, "Then you need something, we try to keep your pain level below a 5 (educational dimension)." The patient's **mother** replied, "She's never been that, even last night they gave her morphine which knocked her out (political & educational dimensions)." The **nurse decides** on a **plan** to address both nausea and pain, "I want to give you something with it so you don't get sick, do you want a cracker or a graham cracker (political & technologic/physiological dimensions)?"

On **reassessments** the nurse did not intervene, even though the patient clearly alerted her to continued pain (social/cultural dimension). "How is your pain level?" The **patient** responds, "It still hurts (social/cultural dimension)." The nurse clarifies with a leading comment, "Still an **8** (political &

technologic/physiological dimension)?" The patient confirms, "Yes." The nurse explains, "**Physical Therapy** said they would be here in a little while (political & technologic/physiological dimensions)."

At 9:37 a nurse being observed asks the physical therapist, "Were you looking for me?" She **informs the physical therapist** that the patient was medicated an hour ago, but 30 minutes ago pain still an 8 (political dimension). The physical therapist comments, "She had no pain **yesterday** that was 45 to 60 minutes after pain meds, she did really well (political dimension)." Just 14 minutes later the **charge nurse informs** the nurse observed that the patient has been cleared to go by pain service and she called for scheduled Zofran (political dimension). Less than a half an hour later, the patient's **mother** asks when pain service will be here (political dimension). The nurse asks, "Do you want to see pain team?" The physical therapist interjects, "I thought they had a note that they would come by?" The nurse replies, "I was told **they signed off** and she can go home. Did you need or want to see them (political dimension)?" The **mother** responds, "No (political dimension)."

The patient was hesitant to go home two hours later. The patient's **mother** tells the patient, "You can be just as uncomfortable at home as you are here. You have to **tell them** why you don't want to go home (social/cultural dimension)." The nurse clarifies, "Is it the pain?" The **patient replies**, "and **nausea** (social/cultural & technologic/physiological dimensions)." The **nurse offers**, "I can call them (political dimension). Do you have something for nausea at home?" The patient's **mom answers**, "I have Zofran, she just has been yucky since that Morphine (educational & political dimensions)."

The physical therapist comments after working with the patient, "She did great walking yesterday. No pain and she did it multiple times, so I am not concerned about safety. She's just not feeling well (technologic/physiological dimension)."

The nurse seeks out her **charge nurse** for consultation (political dimension). She reports, "**Mom** is ready to go home, but the patient (is) not ready. She's **crying** (political & technologic/physiological dimensions)." The charge nurse offers, "Well, if she needs to wait and get another **round of pain med**, that's OK (economic & technologic/physiological dimension)." The nurse clarifies, "Did you talk to **pain**? Did they see her?" The **charge nurse** responds, “I spoke to pain nurse and she thought she had already gone home (political dimension). She got an epidural for a **scope** (social/cultural dimension)!” The observed nurse comments, "She is on 10 mg of Norco, that would knock me out."

The nurse discharges the patient at 10:54. When the patient was in a wheelchair awaiting discharge transportation, the nurse asked, "Do **you want** Motrin for the road, she has a dose due at noon." While it sounded like the nurse was asking the patient’s mother, the **patient** responded, "OK (political dimension)." The mother asks the patient, "Do you want to take that puke bowl with us?" The nurse suggests, "Do you want one of those bags?" The **mother** agrees, "Yeh, that's a good idea (political dimension)." The nurse wishes the patient well, "You take care, ok **- hope** you feel better (spiritual/religious dimension)."

The **pain management team** is not notified of the patients continued pain or nausea prior to discharge (political dimension). The nurse sees the pain management nurse just over an hour later and still never discusses the challenges controlling this patient’s pain and nausea.

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## BIOGRAPHICAL INFORMATION

Dr. Manworren received her bachelor's degree in nursing from Loyola University, Chicago in 1988 and her Master's degree in Pediatric Nursing from Rush University, Chicago in 1994. She also completed her wound, ostomy, and continence nurse training from Albany enterostomal therapy program in 1994. Dr. Manworren has provided clinical and professional leadership in pediatric surgical care and pediatric pain management throughout her career. Dr. Manworren was inducted into the Mortar Board honor society in 1984, Sigma Theta Tau, the International Nursing Honor Society, in 1988 and Phi Kappa Phi in 2007. Dr. Manworren has also been named a University Scholar at the University of Texas Arlington in 2006 and 2008. She was awarded the Ferne C. Newman Kyba Fellowship to complete her dissertation work in 2010. Dr. Manworren has been recognized for her leadership with a Professional Service Award from Rush University in 1994, for Excellence in Advanced Practice Nursing from the Society of Pediatric Nurses in 2001, and as a Dallas-Ft Worth Great 100 Nurse in 2001. Dr. Manworren was a founding member of the American Pediatric Surgical Nurses Association and the organizations third President. Dr. Manworren is master faculty of the American Society for Pain Management Nursing and was one of the first board certified pain management nurses in the United States. She is frequently an invited lecturer both nationally and internationally providing over 100 presentations related to pediatric pain assessment and management as well as pain management nursing issues and reporting on her latest clinical and research results. Dr. Manworren developed the Pediatric Nurses' Knowledge and Attitudes Regarding Pain Survey in 1998, which has been used in over a hundred organizations in the United States, as well as institutions in the United Kingdom, Ireland, Australia, South Africa, Canada, & New Zealand. The tool has also been translated by researchers in China, Taiwan, Israel, Norway, Germany, Peru, Portugal, Italy and Puerta Rico for use with pediatric nurses in these countries. Dr. Manworren's research interests also include validation of the pain scales for preverbal and non-verbal children, new interventions to treat children's pain, and her current effort is to bridge the gap of knowledge and translation into clinical practice by studying nurses' negotiation of the bureaucracy of caring to relieve children's acute postoperative pain. Dr. Manworren is a member of the American Pain Society's Clinical Practice Guidelines Committee and the RN planner for the organizations annual scientific program. On a personal note, Dr. Manworren was the Team USA Special Olympics Head Gymnastics Coach, World Games, Shanghai China 2007, the head coach for Plano Special Olympics Gymnastics Coach, since 1998 and a USA Women's Gymnastics Judge for over 30 years receiving a National Rating in 2001. Renee has been happily married to John Manworren since 1994 and they have four wonderful children: Brittany 25, Max 19, Jack 16, and Jordon 8.