EXPERT NURSES' DECISION-MAKING REGARDING INTRAVENOUS PATIENT CONTROLLED ANALGESIA

by

BARBARA ELAINE McLEOD

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Department of Nursing

The University of British Columbia
Vancouver, Canada

Date August 30, 2000
ABSTRACT

Little is known about how expert nurses make decisions regarding IV PCA therapy and the factors and/or barriers affecting those decisions. The purpose of this research was to examine how expert nurses manage acute postoperative pain using the modality of IV PCA, and the processes nurses use to make decisions about IV PCA therapy in day-to-day clinical practice. The qualitative method of noncategorical, interpretive description guided the study. Seven participants were recruited via a process of nomination. Data collection included a modified think-aloud technique and post-think aloud interviews. Data were transcribed verbatim and analysis involved data inductively produced from the interviews and think aloud statements. A reflexive journal was used to provide insight into decisions made by the researcher and the rationale for making those decisions. The study generated six conclusive statements. (1) Nurses make a distinction between having IV PCA expertise and being an expert nurse in IV PCA therapy. (2) Nursing knowledge related to pain management and IV PCA, clinical judgment, and clinical reasoning are intimately interconnected and contribute to nurses' decision-making and pain management outcomes. (3) Three types of decisions are used (a) immediately intervene, (b) wait and watch with potential intervention at a later time, and (c) to do nothing. (4) Personal and institutional factors influence all of these decisions. (5) Pain management outcomes resulting from the nurses' decisions in regard to IV PCA were usually less than optimal. (6) Nurses do not consistently implement physicians' standing prn orders within the specified time frames to optimally manage acute postoperative pain using IV PCA. Implications of this research focus largely on the need for development and commitment to pain management standards of care (both generic and for IV PCA) and ongoing education around pain management. Further research is indicated to monitor and evaluate the outcomes of IV PCA.
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August 30, 2000
DEDICATION

I remember being 15 years of age and becoming a protegé of a prominent physician, Dr. Glenn W. Toomey who practiced medicine in Devils Lake, North Dakota. At the time, (and several years later), I had no idea what it meant to be a protégé. Today, I do understand the mentor/protégé relationship. Dr. Toomey was a special and generous person who has and continues to influence my professional nursing career. I am very grateful for the rich opportunities that I have experienced because of his belief in me as a person, and as a professional nurse.

I dedicate this thesis to the memory of

Dr. Glenn William Toomey ~ My Mentor

(September 21, 1906 - July 31, 1982)
CHAPTER ONE: INTRODUCTION

Purpose of the Study

Patient Controlled Analgesia (PCA) is a technology used in postoperative pain management that allows a patient to self-deliver small intravenous (IV) doses of opioid medication via a pre-programmed infusion pump. At a meeting of the Registered Nurses Association of British Columbia (RNABC) Nursing Research Committee in 1991, members discussed their experiences of implementing a PCA approach within their organizations and questioned why nurses were not using PCA as it was intended in nursing practice (Clarke, Derrick, Eivemark, Fulton, Iker, Jardine, Leroux, MacDonald, Marshall, McCall, McLeod, Nixon, Muir & Turner, 1994). The outcome of this discussion was that an interagency, collaborative, and participatory action research group was formed to address this question; the sole purpose of this study was to examine nurses' learning needs in bringing about effective and efficient implementation of a PCA approach within the complexity of decision-making about pain management (Clarke et al., 1994). The RNABC study was an attempt to address the issue globally. My research study focused more specifically on the clinical judgments that nurses actually use in their everyday IV PCA practice. Previous research investigating the adoption of PCA has assumed that acceptance of the technology is the critical component of its successful adoption. However, because little is known about how nurses make decisions regarding the how and the why of PCA, an understanding of why nurses have not adopted this technology wholeheartedly remained incomplete before findings of my study were collected.

As a nurse educator with many years of experience in managing, monitoring, and instructing the practice of IV PCA as well as developing, implementing, and revising an IV PCA program within a health care agency, I had observed that pain continues to be inadequately managed in the IV PCA adult patient population, begging the question, "why"? As well, I had had the experience of being involved in two
legal cases where unfavorable outcomes occurred for patients receiving IV PCA therapy. My involvement with these legal incidents furthered my ethical interest and responsibility in questioning the practice of IV PCA as it related to nurses and nursing.

The purpose of my research is to extend the RNABC study. My research looks at how surgical nurses manage IV PCA therapy in acute postoperative clinical practice and at the processes nurses use to make decisions about IV PCA. Nurses’ decision-making is examined within the descriptions of day-to-day IV PCA practice. An effort is made to ascertain an answer to the question, What does expert nursing care mean in the context of IV PCA therapy and decision-making?

**Background Information**

PCA has become a popular and widely accepted treatment modality for providing acute postoperative pain relief. Demand-adapted opioid titration using a device for IV PCA is often recommended for the management of severe postoperative pain (Striebel, Romer, Kopf, & Schwagmeier, 1996). However, IV PCA is not universally effective in providing high quality analgesia, and patient satisfaction remains the subject of debate (Griffin, Brennan, & McShane, 1998). Widespread belief exists that PCA allows the patient to titrate analgesia for pain in a finer way than does conventional administration of analgesia by the nurse (Taylor, Hall, & Salmon, 1996). Yet, in many countries, intramuscular (IM) opioid administration remains the standard of practice despite being an invasive intervention characterized by large fluctuations in blood levels of the analgesic. Traditional IM analgesia administration does not allow opioid titration (Striebel et al.); nor does it allow any patient or nurse control beyond the parameters stipulated by the physicians’ orders.

The experience of IV PCA can only be understood in the context of nursing care because it is typically the nurse who works in collaboration with the patient and the anesthesiologist to achieve postoperative pain relief for the patient during IV PCA therapy. My recollection of IV PCA’s introduction
into health care is that it was marketed and sold to health care professionals as the ultimate in new pain management technology utilizing oversimplistic notions of what is necessary in IV PCA treatment. The key marketing features of IV PCA treatment were (a) the control patients would gain over their own pain (b) the time nurses would save (Koh & Thomas, 1994), and (c) the more consistent pain control patients would experience with fewer adverse opioid side effects.

Interestingly, a landmark study by Taylor, Hall, and Salmon (1996) found conflicting results when they examined the patient’s perspective in response to the conventional view that patients’ value PCA because of the control it afforded them over their treatment. The study findings revealed “PCA was only rarely described as a way of gaining control over analgesia and, in general, this was not valued” (p. 1137). According to Taylor et al. (1996), these qualitative results are the first in the literature to suggest that the theoretically and professionally constructed concept of PCA as a method for self-control over pain is inconsistent with patients’ experiences.

Initial PCA marketing did not include the notion of a nurse’s shared responsibility in PCA opioid titration. This, I believe, has misled practitioners in the development and implementation of IV PCA programs. In my clinical experience, patient self-administration is only one component of achieving pain relief in IV PCA therapy. The nurse also is responsible for working with the patient to achieve pain relief, such as titrating opioids based on a balance between analgesic need and undesirable side effects. The appropriate and effective administration of IV PCA includes a nursing responsibility that was not clearly and explicitly identified and marketed in the initial promotion of IV PCA. For example, Jones and Brooks (1990), stated “all the nurses needed to do for PCA patients was attach the filled device, check the approximate morphine usage every shift, and then discontinue it after three days” (p. 57). This is not true since the nurse has a responsibility to assess the patient’s response to managing pain and IV PCA as well as being responsible for intervening appropriately. The failure to include or consider the active
participation of the nurse and the nurse-client interaction/relationship has left the IV PCA program flawed, incomplete, and in need of revision. As Ready suggested (1990) “there is a widespread misconception that pain relief with PCA is completely automatic. In fact, PCA can only be used optimally when it is accompanied by regular, expert nursing and medical supervision” (p. 720).

The research problem specifically involves trying to understand how expert nurses make clinical judgments in relation to initiating, maintaining, and discontinuing pharmacological IV PCA therapy for adult patients experiencing acute postoperative pain. Inherent in this practice is the issue of opioid titration. One of the challenges for nurses working with patients utilizing IV PCA therapy is the balancing of adequate opioids against adverse opioid side effects or against imagined consequences of opioid “over-use” to promote pain relief for patients (Taylor et al., 1996).

When caring for patients experiencing postoperative surgical pain and in accordance with physicians’ preprogrammed orders for IV PCA, nurses have latitude in managing IV PCA treatment and decision-making regarding opioid titration throughout the course of treatment. Webster’s College Dictionary defines latitude as “freedom from narrow restrictions; freedom of action, opinion, etc.” (p.741). McCaffery and Pasero (1999) define opioid titration as “adjusting the dose of an opioid” (p.757). Although anesthesiologists are responsible for prescribing IV PCA orders, nurses are responsible for assessing, documenting, and adjusting opioid doses based on the patient’s identified comfort goal or acceptable pain level for his/her perceived pain within the physicians’ standing prn orders for opioid titration. Opioid titration begins at the onset of IV PCA therapy, continues throughout IV PCA therapy, and terminates once the patient is weaned from IV PCA therapy on to oral analgesia.

From what I have seen and experienced in practice, there is a paucity of nursing knowledge about the factors that influence nurses’ decision-making during the management of opioid titration in IV PCA therapy. This study has sought to expand the body of knowledge by generally defining how expert nurses
manage IV PCA in order to provide useful direction for furthering nurses’ knowledge of IV PCA. In addition, it assists nurses to develop teaching strategies and/or interventions in order to make expert clinical nursing judgments in the management of IV PCA therapy.

**Definition of Terms**

Preferred to the term 'narcotic', the term *opioid* refers to natural, semisynthetic and synthetic drugs that relieve pain by binding to opioid receptors in the nervous system. The term ‘opioid’ is preferred to the term ‘opiate’ because it includes all agonists and antagonists with morphine like activity, as well as naturally occurring and synthetic opioid peptides” (McCaffery & Pasero, 1999, p. 757). For the purposes of this study, an opioid refers to one of the following intravenous drugs typically used during IV PCA therapy: Morphine, Meperidine (Demerol), or Fentanyl; and the oral opioid Tylenol® with Codeine (Tylenol #3).

The term *opioid titration* has traditionally referred to adjusting the dosage of an opioid. In this study, the term is multifaceted and refers to adjusting the dose of an opioid in the context of a team approach including the patient-nurse-anesthesiologist triad in relation to implementation of the physicians' standing prn orders.

With regard to IV PCA, *nursing assessment* refers to the combined subjective and objective observations of the nurse such as the patient’s self-report of pain and the pharmacological safety of opioids. Based on this assessment, the nurse can sequentially adjust the IV PCA pump by using the physicians' standing prn orders to

(a) increase the IV PCA dose during the first hour postoperative hour;

(b) decrease the lockout the second postoperative hour; and

(c) call the anesthesiologist to discuss the clinical IV PCA situation by the third postoperative hour.
At this time and in collaboration with the anesthesiologist, the nurse can adjust the IV opioid dose by changing the physicians' standing prn orders as an outcome of the patient/nurse/anesthesiologist decision-making process.

In this study, *IV PCA practice* refers to the entire scope of IV PCA therapy. Elements include patient selection; patient education; IV PCA initiation, monitoring; and weaning; and IV PCA termination. Typically, the following three unique, complex, and interrelated processes occur simultaneously during IV PCA therapy. First, the patient self-administers IV opioid via a special infusion pump by pushing a button attached to a pump that releases a pre-programmed amount of opioid when he/she feels or reports pain. In this context, IV PCA refers to the bolus dose a patient controls when experiencing pain. First, the opioid dose is delivered on demand via the pump. Second, the nurse has the ability to adjust the IV PCA pump’s pre-programmed opioid dose for uncontrolled pain based on the physicians' standing prn orders and on nursing assessment of the patient’s pain. Thus, IV PCA monitoring refers to balancing opioid need with undesirable side effects as ascertained by pain assessment scales and/or by pain behaviors and pain flow sheets; IV PCA weaning refers to the transition from IV opioid to oral opioid, typically the oral opioid Tylenol #3. In this study, three specific criteria determine weaning (a) less than 6 milligrams of Morphine are used in any awake 4-hour period or the equivalent of Demerol or Fentanyl in any awake 4-hour period, (b) bowel sounds are present; and (c) the patient is tolerating oral fluids. These three criteria became part of my organization’s IV PCA protocol effective June 1999. Prior to this, nurses had more flexibility in decision-making around when to initiate oral titration.

The term *pain management* refers to "the alleviation of pain or a reduction in pain to a level of comfort that is acceptable to the patient" (Young, 1999, p. 11).

An *expert nurse* is one whose practice is "characterized by engaged practical reasoning, which relies on mature and practiced understanding, and a perceptual grasp of situations and commonalities in
particular situations. While nurses at this level know what to anticipate and how to prepare for possible issues and problems, expert practice requires remaining open to what the situation presents" (Benner, Tanner, Chesla, 1996, p. 143).

**Research Question**

A purpose of this research study was to ascertain an answer to the question, What does expert nursing care mean in the context of IV PCA therapy? The umbrella research question that directed this research was: How do expert nurses manage acute postoperative pain in the adult patient population using the modality of intravenous (IV) Patient Controlled Analgesia (PCA) including decision-making around initiating, maintaining, and discontinuing pharmacological IV PCA therapy? The following sub-questions also directed the study:

1. What is the nurses' perception of her/his role in acute postoperative pain management for the adult patient population?
2. With respect to IV PCA pain management, what does a physician's standing prn order mean to the nurse?
3. What are the components of the decision-making process in nurses' decision-making in pain management? How are these components sequenced or related? What factors influence both the components and the sequencing of nurses' decision-making in pain management?
4. What factors, resources, and tools do nurses use in the appraisal phase of decision-making about pain management? How are they used?

**Philosophical Orientation**

Various traditional approaches to qualitative research exist today and are aimed at answering relevant clinical questions in nursing practice. However, Thorne, Kirkham, and MacDonald-Emes (1997) present their view that "it may be an appropriate time in our history to consider
noncategorical qualitative research approaches that are derived from an understanding of nursing’s philosophical and theoretical foundations as credible and legitimate ways to access knowledge for nursing. In this context, interpretive description is proposed as one such method” (Thorne et al., 1997, pp. 169-170). According to Burns and Grove (1993), it is critical to understand the philosophical orientation of the method because it will influence the interpretation of research data. The philosophical orientation of interpretive description is based on the view that “today’s nursing science seeks as its ‘truth’ a set of ideas that have application potential, but remain amenable to reconsideration in the light of varying contexts, new concepts, new ways of understanding, and new meanings. The qualitative research approach in this study is grounded in an interpretive orientation that acknowledges the constructed and contextual nature of much of the health-illness experience, yet also allows for shared realities” (Thorne et al., 1997, p. 172).

I believe that practice knowledge of nurses can be elicited, that we can grasp what nurses consider and apply when deciding what to do during opioid titration in their IV PCA practice. I believe an understanding of this nursing knowledge is essential in order to ameliorate pain in a manner that is consistent with the desire of the patient and the acceptability of adverse opioid side-effects (Drayer, Henderson, & Reidenberg, 1999). Since the concept of IV PCA opioid titration is a contextual one, I do not believe that one truth or theory considering all possible factors can be revealed. In my experience, the overall management of opioid titration is inconsistently applied in nursing practice and not universally understood. This means that an outcome for adult patients receiving IV PCA therapy is a continued experience with uncontrolled, postoperative pain. I believe this is not “best” nursing practice and is potentially harmful to both patients and nurses. Harmful to both patients and nurses in relation to the potential legal ramifications if patients experience morbidity and mortality outcomes secondary to opioid side effects in the context of ineffective and/or incompetent nursing practice due to inadequate nursing knowledge and/or inappropriate nursing interventions required to prevent these outcomes.
Analytic Framework

Thorne et al. (1997) argue that "going in blind can be counterproductive to nursing's scientific knowledge development" (p. 173). Therefore, I constructed for this study an analytic framework on the basis of a critical analysis of existing knowledge, which represents an appropriate platform on which to build a qualitative design. The conceptual framework of this study is based on existing knowledge related to the concepts of acute postoperative pain, nurses' decision-making, clinical nursing judgments, and IV PCA. This framework orients the inquiry, provides rationale for its anticipated boundaries, and makes explicit the theoretical assumptions, biases, and preconceptions that drive the design decisions. The framework provides the foundation for this new inquiry since it represents a beginning point rather than a pre-existing organizational structure for what is found in the literature.

Summary

Of six chapters, Chapter One introduces the study, describing the purpose and the background, which prompted the research study's inception. As well, the philosophical perspective of the study is discussed, an analytic framework is proposed, necessary definitions and beliefs are identified, and the research question and sub-questions are presented. The significance of the results of this study is also articulated.

Chapter Two contains a review of the literature organized according to the analytic framework proposed in Chapter One, a description of the study's analytic framework, and a schematic diagram representing nurses' decision-making based on the researcher's interpretation of the literature in relation to the four concepts of the framework.

Chapter Three describes the research method, the design, and the data analysis. Chapter Four presents the data and statistical analysis, and Chapter Five discusses the findings. Chapter Six summarizes the research process, identifying six major themes found in the research findings, and
discussing implications of the findings for nursing including those that are clinical, educational, and research orientated.
CHAPTER TWO: LITERATURE REVIEW

The purpose of this chapter is to critically examine and review existing literature in order to develop an appropriate foundation on which to design and implement this study. The method of interpretive description requires that the research question be located within existing knowledge so findings can be constructed on the basis of thoughtful linkages to the work of others (Thorne, Reimer Kirkham & MacDonald-Emes, 1997). The research question in this study is, How do expert nurses manage acute postoperative pain in the adult patient population using the modality of intravenous (IV) Patient Controlled Analgesia (PCA) including decision-making around initiating, maintaining, and discontinuing pharmacological IV PCA therapy? This research question directed me to explore literature related to three concepts: (a) acute postoperative pain, (b) nurses’ decision-making and clinical judgment, and (c) IV PCA.

The literature review and analysis is organized into the following three sections: (a) acute postoperative pain management including an evolving definition of pain and identifies that pain management continues to be problematic in nursing practice, (b) nurses’ decision-making and clinical judgment, and (3) an historical evolution of PCA philosophy and pump technology. The literature presented herein is selectively limited as defined within each review due to the enormity of literature pertaining to each of these concepts. Chapter Two ends with a summary of the literature review, a description of the study’s analytic framework (which is a beginning point for what was found in the inquiry), and a schematic diagram representing nurses’ decision-making based on what is known from my interpretation of the literature.

Acute, Postoperative Pain Management

The concept of acute postoperative pain management in the adult patient population is vast. To facilitate an understanding of this domain of practice, a definition of pain is explored, problems in acute
postoperative pain management are globally identified, and specific issues relevant to this study are examined in the context of nursing knowledge, physicians' standing prn orders, and nursing documentation.

**Definition of Pain**

The concept of acute postoperative pain management is pertinent to the research question since postoperative pain is a typical outcome of a surgical intervention frequently treated by using IV PCA. The definition of pain has evolved over the centuries as humans have tried to ascribe meaning to pain, to explain its causes, and to find pain relief (Benoliel, 1995). Many different definitions and meanings are given to pain depending upon how it is viewed. The differing perspectives of pain include biological, psychological, organizational, medical and nursing related, as well as the *lived experience* of patients and families experiencing pain in everyday life (Benoliel, 1995).

Pain was defined by the International Association for the Study of Pain (IASP) Subcommittee on Taxonomy as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (1979, p. 250). Inherent in the meaning of this definition is that pain is always subjective. In 1992, the Agency for Health Care Policy and Research (AHCPR) defined pain as a “complex, subjective response with several quantifiable features including intensity, time course, quality, impact, and personal meaning” (p. 7). McCaffery and Pasero (1999) cite McCaffery’s 1968 definition of pain found in clinical practice as “pain is whatever the experiencing person says it is, existing whenever he says it does” (p. 17).

Acute pain is described as usually signaling injury, as having a recent onset and brief duration, and as subsiding as healing of the injury occurs; it may be associated with increased autonomic activity and anxiety (Good, 1999). Good examined the acute pain literature published between 1990 and early 1998 from the disciplines of nursing, medicine, psychology and neuroscience. This comprehensive review
acknowledged that persistent, unresolved pain could effect the neural, autonomic, and immune systems. Unrelieved pain is not only unpleasant but can cause neural, immune, and genetic change resulting in chronic pain. Good (1999) recommends that prevention and effective relief of acute pain may reduce the outcome of chronic pain, improve sleep and immune function, and reduce complications and metastasis.

Postoperative pain is “a multidimensional phenomenon that evokes highly variable responses across individuals and situations. Sensory, affective, and evaluative processes produce pain's multidimensionality. Individual responses are mediated by multiple physiological and psychological elements. The treatment of pain, which can be as complex as the experience, demands understanding, insight, skill, and vigilance” (Dalton et al., 1999, p. 277). As Pasero and McCaffery (1996) eloquently articulated, “unrelieved postoperative pain, in itself, must now be viewed and treated as a serious complication of surgery, not as an acceptable consequence” (p. 45).

In summary, a review of the literature illuminates acute postoperative pain as a complex, subjective experience that is time-limited as normal healing occurs. Traditionally, postoperative pain has been considered an acceptable outcome of surgery. Today, within the context of normal healing, postoperative pain must be recognized as a serious complication of surgery. Unrelieved and unresolved pain can affect other body systems leading to chronic pain, which in turn can trigger additional negative consequences such as insomnia. Fundamentally, nurses must have the necessary knowledge, skills, and abilities in order to make appropriate clinical judgments when caring for patients experiencing acute postoperative pain. Competence, as defined by the RNABC (1998), is the "ability of the registered nurse to integrate and apply, in a manner consistent with the standards for the profession, the knowledge, skills, attitudes and judgment required to perform safely in the domain of possible encounters which define the registered nurse's scope of practice" (p.39).
Problems in Pain Management

A consistent theme of great concern in the literature pertains to the inadequate and ineffective management of acute postoperative pain. Recognizing and acknowledging this problem, the United States AHCPR formalized a process of addressing acute pain and its management and published the first Clinical Practice Guideline on Acute Pain Management (Acute Pain Management Panel, 1992). Widespread dissemination of these guidelines signifies a landmark approach in caring for patients experiencing acute postoperative pain. However, the availability of well-published guidelines is not solely sufficient to ensure adoption of the guidelines and achieve improvements in patient care (Coyne, Smith, Stein, Hieser & Hoover, 1998; Dalton, Blau, Lindley, Carlson, Youngblood & Greer, 1999; Devine, Bevsek, Brubakken, Johnson, Ryan, Liefert & Rodgers, 1999).

Inadequate pain management practices result from a multitude of causes involving patients' and providers' attitudes, lack of knowledge, the settings in which patients receive care, systems problems, regulatory obstacles and/or a combination of all of the above (Dufault & Sullivan, 1999). For the purpose of this paper, the literature review is limited to factors and research related to health professionals, specifically nurses, and nurses' relationship to nursing practice.

Nurses are required to make pain decisions based on their knowledge within the context of physicians' standing prn orders and through communication vis-à-vis the patients' health care record (i.e., documentation practices). Still, analysis of the literature demonstrates that the definition of pain is continuing to evolve and that acute postoperative pain management remains sub-optimal in nursing practice. To gain a greater depth of understanding as to why this is, four interrelated concepts are explored in four separate sections: nursing knowledge, physicians' standing prn, nursing documentation and nurses' accountability and responsibility for pain management.
Nursing Knowledge

Nursing knowledge, in general, is more than the result of seeking factual information. To Whittemore, becoming knowledge is "a process whereby one is fully engaged in the moment, in the experience, and in the patient, attentive to all the cues, and then responding decisively with clarity of thought and exemplary reasoning. It is knowing what to do when, doing the right thing at the right time, and knowing the limits of knowledge. It is keeping centered on the perspective and the purpose of actions, linking the known of this intellectual process with the known of the individual" (Whittemore, 1999, p. 366).

At present, several nursing factors contribute to poor pain management practices. A number of authors have documented inadequate nursing knowledge regarding opioids, pain assessment and management (AHCPR, 1992; Alcock, 1996; Brown, Bowman, Eason, 1999; Coyne, Reinert, Cater, Dubuisson, Smith, Parker, Chatham, 1999; Dalton, Blau, Carlson, Mann, Bernard, Toomey, Pierce & Germino, 1996; Dufault, Bielecki, Collins & Willey, 1995; Dufault & Sullivan, 1999; Ferrell, McGuire, & Donovan, 1993; Hamilton & Edgar, 1992; Huber, Feser & Hughes, 1999; McCaffery & Ferrell, 1994; McCaffery & Ferrell, 1997; McCaffery & Ferrell, 1999; McCaffery, Ferrell, O’Neil-Page & Lester, 1990; Pederson & Parran, 1997; Watt-Watson, 1987). Watt-Watson, a nurse researcher (1987), examined nurses’ knowledge related to pain assessment and narcotic administration with 207 nurses (106 graduate nurses and 101 baccalaureate students [48 third year, 53 second year]) voluntarily attending pain presentations over a nine-month period. A questionnaire was developed (reliability and validity were not discussed) to specifically assess pain assessment and narcotic administration. Two open-ended questions were used to capture the nurses’ perspectives about difficult nursing problems and their use of assessment tools and/or approaches. The results of Watt-Watson’s (1987) study are that only 3% of this sample scored higher than 75% on the questionnaire. In relation to pain assessment, the majority of subjects (96%
RN, 91% students) acknowledged that patient input was important in assessing pain and most (94% RN, 66% students) identified that pain severity and duration could not be accurately determined relative to the pain stimulus. The notion of pain stimulus is consistent with Sechzer’s pioneering work in the technological development and advancement of the modality of IV PCA (Sechzer, 1968, 1971, and 1990). Nursing assessments were portrayed as “not specific, haphazard, poor, very subjective and very loosely done” (p. 208). Qualitative data identified that only seven subjects (3%) were using a standard approach (analogue scales or flow charts) to pain assessment.

Watt-Watson (1987) found that a general lack of knowledge existed with respect to narcotic administration. Concerning specific narcotics, she found a lack of knowledge around appropriate doses, side effects, duration of drug action, and addiction potential. In addition to the knowledge deficits, Watt-Watson found evidence of conflict between nurses and doctors and of feelings of frustration among nurses using unsuccessful pain approaches.

In a pilot study, Ferrell, Eberts, McCaffery, and Grant (1991) examined how nurses make clinical decisions regarding pain and what factors influence these decisions. In the context of Ferrell et al.’s (1991) study, clinical decision-making is defined as “a process in which knowledge is used to make choices among alternatives about actions which affect patient outcomes” (p. 290). Following a review of the clinical decision-making literature, Ferrell et al. (1991) developed a tentative conceptual model of clinical decision-making in nursing for pain management (see Figure 1). The model includes the concepts of influencing factors, process, choices, and outcomes.
**Figure 1:** Clinical decision-making in nursing for pain management.

<table>
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<tr>
<th>Influencing Factors</th>
<th>Process</th>
<th>Choices</th>
<th>Outcomes</th>
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<td><strong>Patients</strong></td>
<td>Acknowledging Alternatives</td>
<td>Does Pain Exist?</td>
<td>Positive Pain Relieved Low Nurse Conflict</td>
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<td>Pain Reports</td>
<td>Identifying Goals</td>
<td>Does Pain Need Action?</td>
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<td>Behavior</td>
<td>Recognizing Self-Knowledge and Values</td>
<td>What to Do?</td>
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<td>When to Act?</td>
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<td>Beliefs</td>
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<td><strong>Physicians</strong></td>
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<td>Negative Pain Remains High Nurse Conflict</td>
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Findings in the Ferrell et al. study (1991) indicate that pain management is intimately linked to decision-making. Nurses frequently make decisions regarding pain assessment and its management related to pharmacological interventions and the patient’s intensity of pain, which may be influenced by a number of factors such as patient report, patient behaviors, and reliance of information by others. Yet, nurses also reported the existence of ethical and professional conflicts regarding pain management as well as barriers to providing optimal pain relief, which included a lack of knowledge and cooperation among physicians, nurse colleagues, patients and family members when implementing pharmacologic pain management.

An interesting finding in the Ferrell et al. (1991) study is that even when nurses have adequate knowledge about pain management, frequent and difficult decisions must be made. Decisions made regarding pain treatments carry significant outcomes for patients such as potential physical harm from
oversedation or respiratory depression and the psychological harm of suffering from unrelieved pain resulting in ethical dilemmas. Ferrell et al. (1991) recommend that future research should explore the processes used in making these decisions and the validity of the sources of information in making accurate pain assessments. Ferrell et al.'s study (1991) is critical because the tentative conceptual model of clinical decision-making could provide a foundational, schematic visualization to guide clinical decision-making in nursing practice for pain management. Unfortunately, there has been no extension of their research reported in further literature.

Hamers, van den Hout, Halfens, Abu-Saad and Heijltjes (1997) state that "expertise covers both the knowledge and experience one has acquired over time" (p. 326). However, a remarkable finding in their study was that expertise does not influence pain assessments. They did not find support for their expectation that assessed pain intensity would decrease with an increasing level of expertise. The theoretical explanation is that the level of expertise probably does not determine final pain assessments but may determine how fast one reaches a decision regarding assessment. In a previous study by Hamer et al. (1993), expertise was identified as influencing the amount of time needed to come to a decision; experts make up their minds more quickly (p. 330). According to these researchers, one cannot assume that "experts" make better decisions, but that "experts" are able to make decisions faster.

According to Hamers et al. (1997), future research is required to explore the processes used in making these decisions and the validity of these sources of information in making accurate pain assessments. Nursing knowledge is an important precursor to decision-making. These authors define clinical decision-making as "a process in which knowledge is used to make choices among alternatives about actions which affect patient outcomes" (p. 290); specifically, they describe the clinical decision-making of nurses in relation to assessment and relief of pain.
In summary, analysis of the literature related to the concept of nursing knowledge suggests nursing knowledge is a precursor to decision-making, and both nursing knowledge and decision-making are intimately linked to pain management. Factors influencing decision-making are tentatively proposed in Ferrell et al.'s (1991) conceptual framework for clinical decision-making and pain management. There is at present no conclusive evidence that so called expert nurses make better decisions but rather suggests that they make decisions faster.

**Physicians' Standing PRN Orders**

Although it is typically the physician who prescribes opioids, much of the responsibility for pain management falls within nurses' scope of practice. Physicians typically order routine, prn (*pro re nata* meaning "as needed", "prescription of analgesic", "give when required") pain orders and nurses are responsible for drug administration within the context of these prn orders (Acute Pain Management Guideline Panel, 1992; Cohen, 1980; Di Giulio & Crow, 1997; Devine, Bevsek, Brubakken, Johnson, Ryan, Sliefert & Rodgers, 1999; Ferrell, Eberts, McCaffery & Grant, 1991; Grier, Howard, & Cohen, 1979; Murray, 1992; Sun & Weissman, 1994; Watt-Watson, 1987). By law, drug prescription is the mandate of physicians. However, nurses are legally allowed to administer prn drugs based on their decision(s) of when needed (Di Giulio & Crow, 1997). Physicians’ standing prn orders are intended to be used as broad guidelines so that nurses can have wide latitude in decision-making in relation to dosing the drugs (Sun & Weissman, 1994). This decision-making includes making selections in relation to dosage range and time interval (e.g., Demerol 50-100 mg IM every 3-4 hours prn) (Cohen, 1980). Responding to physicians’ standing prn orders, nurses play a pivotal role in pain management. For example, nurses make decisions related to pain assessment, whether or not to give an opioid, and, if so, which one to give, how much to administer, and how often to administer it as well as related to evaluating pain and the patient's response (Cohen, 1980; Clarke, French, Bilodeau, Capasso, Edwards & Empoliti, 1996). According to
Devine et al. (1999), outcome data of surgical patient surveys continue to suggest that routine, opioid prn orders for IM injections fail to relieve pain in about half of postoperative patients and approximately half of all hospitalized postoperative patients fail to receive adequate pain relief.

In addition to acknowledging societal problems with drug abuse and addiction, Marks and Sachar (1973) in their landmark research exposed an additional problem of drug misuse - the failure of physicians to appropriately treat patients (i.e., prn orders) in severe pain with sufficient doses of opioids. Following chart reviews and structured interviews with 37 medical inpatients, findings revealed problems in physicians’ ordering practices for opioids. Physicians underestimated the effective opioid dose range, overestimated the duration of opioid action, and exaggerated the dangers of addiction for medical inpatients receiving Demerol in a therapeutic dose range. For example, Demerol was ordered by physicians in doses of 50 mg every 3 to 4 hours or less (if needed) for 63% of the 37 patients, and a dose of more than 75 mg was prescribed for only 1 patient in this study. Marks and Sachar concluded from their investigation that there was a general pattern of undertreatment of pain by physicians with opioids leading to widespread and significant patient distress. According to these authors, two general reasons contribute to these findings: (a) the pharmacological information about the therapeutic dose range for Demerol is incorrect, and (b) a general lack of understanding exists about addiction, and the dangers of addiction to Demerol in a medical setting are underestimated. These authors suggest these misconceptions most likely lead to undertreatment with opioids by physicians causing needless patients’ suffering. The inclusion of Marks and Sachar’s study in this research is critical because it demonstrates that physicians (and not nurses) have inappropriate knowledge related to pain management. Even more concerning is that physicians have both a legal mandate and authority for prescribing opioids based on what appears to be inadequate knowledge and information for prescribing opioids and nurses are responsible for administering opioids within the context of physicians’ standing prn orders.
Sun and Weissman (1994) conducted a prospective study with one hundred and fifty adult patients in a surgical intensive care unit to contrast physicians’ prn orders with nurses’ actions. They hypothesized that there would be large differences between ordered and administered prn drugs. According to these researchers, physicians lack a complete understanding of narcotic pharmacology and frequently do not prescribe adequate amounts of narcotic analgesics; as well, nurses differ in their understanding of what a prn order means. In the Sun and Weissman study, all orders for narcotics were written daily as prn orders. The results indicated that on average, only 22% to 52% of the mean ordered dose of intravenous and intramuscular morphine was actually administered. Furthermore, the difference between the physician’s order and actual dose administered depended on the type of medication and route. For example, morphine was administered below the mean prescribed dose during the initial 48 hours postoperatively. The Sun and Weissman (1997) study revealed that, 21 years following Marks and Sachar’s work, physicians and nurses continue to lack appropriate knowledge related to opioid pharmacology and continue to underprescribe and under administer opioids based on these knowledge deficits.

Di Giulio and Crow (1997) recruited a convenience sample of ten doctors and nurses in a qualitative, descriptive, comparative study to capture decision-making about diagnostic reasoning relating to whether or not to administer prn drugs to postoperative cancer patients. The method used was simulation accompanied by a think aloud technique and verbal protocol analyses. Think aloud is a technique that is used to gain access to an individual's mental processes while performing a task; it allows the decision-maker to think aloud and to verbalize their thinking into a tape recorder which is later transcribed (Di Giulio & Crow, 1997). Cognitive processes take place in short-term memory and remain conscious for a short period of time; therefore, think aloud technique is useful in preventing recall bias which has been previously criticized in retrospective descriptions. The conclusions in this study indicated that no major differences existed in information processing between doctors and nurses. Considering the
limitation of a small sample size, DiGiulio and Crow came to the tentative hypothesis that it was most likely not information processing strategies that made the difference, rather the meaning ascribed to the interpretation. Doctors are primarily interested in diagnosing a patient's problem because that is their domain of practice whereas nurses are taught to assess the whole patient and to perform interventions based on those assessments. DiGiulio and Crow (1997) concluded that the focus of practice is different between doctors and nurses.

In summary, analysis of the physicians' standing prn medication orders indicates that physicians have both a legal mandate and authority for prescribing opioids while nurses have latitude for decision-making within the context of physicians' standing prn orders. A review of this literature emphatically suggests that both physicians and nurses have knowledge deficits related to opioid pharmacology. Physicians are prescribing opioids based on inadequate knowledge, and nurses are compounding the problem by administering opioids based on both insufficient knowledge and an unclear understanding of what a prn order means. Because the focus of practice is different between physicians and nurse (i.e., physicians diagnose and nurses assess and intervene), it is a serious concern that inadequate and ineffective acute postoperative pain management still exists in 1999. It is even more concerning that, [based on insufficient nursing knowledge] nurses are intervening with inadequate physicians' standing prn orders. At best, acute postoperative pain management practices are questionable.

Documentation

Any documentation system chosen by a health care organization and used in a patient's health care record provides a reflection of health care practices as well as evidence of care given or, conversely, care not given. A current review of pain management documentation practices continues to demonstrate inconsistent, ineffective, sporadic, and fragmented pain management by nurses in clinical practice in a
variety of clinical settings (Coyne, Smith, Stein, Hieser & Hoover, 1998; Huber, Feser & Hughes, 1999; Malek & Olivieri, 1996).

Coyne et al. (1998) conducted nonexperimental design research using a descriptive, retrospective approach to describe documentation patterns associated with pain. Their organizing framework was the AHCPR clinical practice guidelines (1992) with a sample of 30 postsurgical medical records. Areas examined include the Interdisciplinary Pain Management Careplan, physicians’ pain medication orders, nurses’ pain assessment patterns, and pharmacologic and nonpharmacologic interventions administered by nurses in treating postsurgical pain. Their study revealed wide variations in nursing practice: different methods of assessing pain were conducted within and across shifts; pain assessments were done approximately once per shift; selection of a pain medication was not based on the patient’s pain intensity rating; and the location of pain was recorded but the medication response was frequently omitted. Furthermore, findings indicated that ongoing efforts to assess and reassess pain intensity and relief at regular intervals did not appear to be incorporated into the unit's clinical practice. In essence, sporadic and ineffectual pain management practice existed. The authors stated, “While every patient deserves a nurse, every patient should expect that nurses within and across shifts will work in collaboration to help them reach the expected outcome of effective pain management” (Coyne et al., 1998, p. 50). In choosing to ignore or in falling short of meeting documentation standards, many nurses and nursing units are continuing to undermine effective pain management thus failing to meet minimum practice expectations.

Malek and Olivieri (1996) conducted a descriptive, retrospective, convenience review of 23 clinical records to examine nurses’ decision-making regarding pain management. They followed the ACHPR Clinical Practice Guideline Acute Pain Management: Operative or Medical Procedures and Trauma (1992) recommendation that an every 2-hour assessment of pain be used as the ideal occurrence of the standard of practice for pain management. Their findings indicated that there was a 19.7%
documentation rate of the ideal occurrences relating to pain assessment. An expected nursing responsibility is that nurses will document the outcome of opioid administration not only to record the patient’s response to their intervention(s) but also to provide the basis for decision-making in relation to further pain-relieving strategies. If nurses are choosing not to document the outcome of their interventions, Malek and Olivieri (1996) raise several thought-provoking questions for consideration:

- “Without evaluation of an intervention, how does the nurse decide on the next intervention?
- What was the patient’s subjective response to the professional care that he/she received?
- On what basis will the next decision be made regarding the dose of medication and/or the frequency?
- How does the nurse evaluate whether the goal/objectives written in the care plan have been met with respect to pain relief and pain management?
- How can the nurses’ professional care be evaluated in a retrospective audit situation?”

(Malek and Olivieri, 1996, pp. 70-71)

Malek and Olivieri (1996) make a good point, that nurses likely complete more nursing assessments than are documented. However, if the nursing assessment is not documented, then professional decision-making skills cannot be deduced from the clinical record: “Without that information in the record, it is not possible for the nurse on the next shift, or on the next day to follow the course of the patient’s pain assessments to make a clinical judgment. In the end, the only basis that can be used to analyze nurses’ clinical decision-making expertise and fulfillment of their professional role is what has been documented” (Malek and Olivieri, 1996, p. 71). In their study, no evidence was found to support nurses documented all assessments of what was causing the pain or how it was relieved. These gaps in documentation create inadequate databases for decision-making and inhibit determining the effectiveness of nursing interventions related to pain management.
From a current Canadian perspective (the Calgary Regional Health Authority), Huber, Feser, and Hughes (1999) reiterate the occurrence of persistent pain management gaps in practice. The incomplete and inconsistent assessment and documentation of pain leading to inadequate pain management are major factors contributing to these gaps. Specifically, the gaps are "a lack of consistent assessment tools, interventions based on assumption, the insufficient knowledge of health care professionals about pain assessment, a lack of outcome standards, and the mobility of patients across settings" (p. 23).

Following a retrospective chart review (n=309), Huber et al. (1999) found the only consistent descriptor documented was the location of pain. The use of a formal assessment tool was used in only 3% of the charts. These problems in pain management were addressed by developing two new tools: (a) The Calgary Interagency Pain Assessment Tool which includes both subjective patient responses, open-ended questions, a body diagram for identifying pain locations and checklists, psychosocial and functional assessment, and a discharge planning section; and (b) The Calgary Interagency Pain Flow Sheet for the ongoing monitoring of pain and the effectiveness of interventions. These two tools were introduced and evaluated at a six-month post evaluation with (n=193) charts. Improvements were noted especially in relation to the use of formal pain assessment tools. While only 3% in the first audit indicated use of formal tools, 31% of charts in the second audit indicated the use of one or both of the new tools. Huber et al. (1999) are encouraged by this improvement in pain management; however, further investigation is required in relation to the meaning of these pain management outcomes.

In summary documentation practices remain inconsistent and problematic in current nursing practice. Although these descriptive research studies describe nurses' documentation practices, no clear evidence exists as to why nurses are continuing to choose not to meet their documentation standards of practice. This research study will explore nurses' documentation practices from the nurses' perspective to gain a clearer understanding as to why these gaps in practice are continuing to persist.
Nurses’ Accountability and Responsibility for Pain Management

A critical element in pain management involves nurses’ accountability and responsibility for accurately assessing, monitoring and managing pain. Joel’s (1999) viewpoint about pain management in nursing practice is that “in the normal course of doing business, pain should be nursing’s fifth vital sign, as basic to practice as temperature, pulse, respiration, and blood pressure” (p. 9). Joel suggests that if pain were the fifth vital sign, it would be a concrete indication of nursing’s accountability for comfort care, making it impossible to easily explain away the persistence of pain and discomfort. Joel further suggests an essential first step in achieving pain as the fifth vital sign is that pain must be recognized as a quality indicator in administrative rules, standards of practice, peer review, clinical ladders, certification, accreditation criteria, and critical paths. The patient’s testimony of pain is one of the most objective measures of comfort. According to Joel, if nurses hide behind arguments of inappropriate dosages, make inferences about the severity of pain, and point fingers at the ordering practices of physicians, then these are “thin excuses for what could be more accurately considered negligence on the part of nurses” (Joel, 1999, p. 9).

Analysis of the literature brings me to the conclusion that acute postoperative pain management remains problematic in current nursing practice. Joel’s (1999) powerful allegation of nurses’ negligence in relation to poor pain management practices is extremely relevant in my thesis because it introduces the notion of nurses’ accountability or lack of accountability in pain management. In keeping with this conclusion is the fact that patients experiencing pain continue to be undermedicated 27 years after opioid undermedicating was first identified as an issue of concern (Marks & Sachar, 1973). As a result of this postoperative pain literature review, I have identified the following five factors that I believe contribute to the current problems in nursing practice:

- nurses’ knowledge deficits regarding opioid pharmacology;
• nurses' lack of understanding of what physicians' standing prn orders mean;
• nurses' undertreatment of pain in the context of physicians' standing prn orders;
• poor nursing assessment or judgments; and
• sporadic, fragmented, and inconsistent documentation which reflects poor pain management practices by nurses.

The pain modality of IV PCA may have a role to play in illuminating and validating these factors in the context of acute postoperative pain management using this modality.

*Nurses' Decision-Making and Clinical Judgment*

Central to the research question--How do nurses manage acute postoperative pain in the adult patient population using the modality of IV PCA including decision-making around initiating, maintaining, and discontinuing pharmacological IV PCA therapy?--is the issue of nurses' decision-making and clinical judgment. An initial literature review regarding the concept of decision-making proves confusing, as a precise definition of decision-making does not exist whereas the term clinical judgment is prevalent. Several terms are frequently used under the rubric of clinical judgment including clinical decision-making, clinical problem solving, clinical reasoning and the nursing process. Benner, Tanner and Chelsea (1996) concur that interchangeable terms have been used in nursing to mean roughly the same phenomenon, such as clinical decision-making, nursing process, clinical problem solving, and more recently critical thinking. For the purpose of this study, clinical judgment and nurses' decision-making will be considered as mutually exclusive, interrelated but individually unique terms.

A brief overview of the concept of clinical judgment in nursing is included in this review for two important reasons: first, to globally differentiate between the concepts of clinical judgment and clinical decision-making in nursing practice (despite the terms being used interchangeably in the literature, there are subtle distinctions that impact on this research and thus clarification must be made), and second, to
explore its role in study sample inclusion criteria in Chapter Three. Alone, the concept of decision-making does not provide insight into the notion of expert nurses whereas the concept of clinical judgment does.

**Nurses' Decision-Making**

Both decision making and clinical judgment are selectively reviewed in more detail. Grier (1984) reviewed and summarized the nursing literature between 1900 and 1982 in an effort to determine how nurses process information to make patient care decisions. Information processing is a science unto itself. Theories useful to the development of information processing are derived from psychology and include cognitive theories such as information-processing psychology, social judgment theory, and decision theory (Ferrell et al., 1991).

According to Corcoran, (1984) “information processing theory describes problem solving behavior as an interaction between a problem solver and a problem task” (p. 155). Information processing in decision-making is dependent on the demands of particular tasks suggesting that the nature of the task is an important variable in the study of decision-making. As well, the interaction between short-and long-term memory can be used to explain the cognitive processes in decision-making (Lee & Ryan-Wenger, 1997). According to Lee and Ryan-Wenger, "one difference between novices and experts has to do with the direction in which problem-solving processes occur. Novices tend to work backward from a hypothesized diagnosis and collect data that would support or refute the diagnosis. Experts apply a combination of intuition or perceptual awareness and extensive previous experience, which is stored as schemata in long-term memory. Experts more often work forward from initial observations, match them with pervious experience, and generate a diagnostic hypothesis" (p. 102). In this research study, the problem-solver is so called expert IV PCA nurses and the nature of the task involves the management of acute postoperative pain in the adult patient population using the modality of IV PCA. Cognitive
processes will be examined to identify factors influencing expert nurses' decision-making regarding patients experiencing acute postoperative pain and receiving the modality of IV PCA in day-to-day clinical nursing practice.

Grier (1984) found that decision-making by nurses varies among nurses, situations, and contexts. Grier suggested nursing research should in future identify skilled nurse decision-makers and describe their information processing strategies, rather than focusing on identifying nurses’ deficiencies in processing information. Unfortunately, Grier does not define the term skilled nurse decision-makers, leading the reader to assume Grier is referring to expert nurses. In contrast, Corcoran (1984) explicitly defines an expert nurse as one currently employed in a leadership position with at least 18 months experience in clinical nursing practice and has at least one criterion of Corcoran’s four specified criteria. Grier (1984) further suggests that an in-depth study of skilled strategies could be most productive for improving decision-making skills and for developing new methods for information processing in nursing practice. Based on Grier’s recommendations, the decision situations in this research study will be confined to acute postoperative pain management using the modality of IV PCA.

Since ambiguity exists in relation to the concept of skilled decision-makers vis-à-vis expert decision-makers, a greater depth of knowledge and understanding is required to promote clarity between these two concepts. Stuart Dreyfus developed a model of skill acquisition based upon the study of chess players and airline pilots. Dreyfus’s model asserts that the acquisition and development of skill is achieved by passing through the following five levels of proficiency: (a) novice, (b) advanced beginner, (c) competent, (d) proficient and (e) expert (Benner, 1984). Each interrelated level is marked by a progressive increase in clinical knowledge and critical thinking through three general aspects of skilled performance. Benner states, “One is the movement from reliance on abstract principles to the use of past concrete experience as paradigms. The second is a change in the learner’s perception of the demand
situation, in which the situation is seen less and less as a compilation of equally relevant bits, and more and more as a complete whole in which only certain parts are relevant. The third is a passage from detached observer to involved performer. The performer no longer stands outside the situation but is engaged in the situation” (Benner, 1984, p. 13).

Through descriptive research and dialogue with nurses, Benner (1984) applied the Dreyfus Model of Skill Acquisition to Nursing in actual clinical situations in order to examine nursing knowledge embedded in actual nursing practice that accrues over time. Benner described each of the five stages along the novice to expert trajectory in the context of nursing practice to exemplify the performance characteristics typical of situational experiences. Benner’s research is significant and applicable in this research study for two reasons. First, it illuminates the progressive, development of nursing knowledge in relation to experiential nursing practice; second, it clearly differentiates between novice and expert clinical nursing practice within the novice to expert continuum. For the purposes of this research, and based on Grier’s (1984) recommendations, I am specifically interested in examining how so called expert nurses in IV PCA therapy make decisions when caring for patients experiencing acute postoperative pain using the modality of IV PCA.

Clinical Nursing Judgment

Tanner (1987) reviewed the nursing literature published between 1966 and 1986 to evaluate and summarize nursing research related to the teaching of clinical judgment. Adapting an early definition of clinical judgment, Tanner described it as “a series of decisions made by the nurse in interaction with the client, regarding (a) the type of observations to be made in the client situation, (b) the evaluation of the data observed and derivation of meaning (diagnosis), and (c) nursing actions that should be taken with or on behalf of the client (management)” (p. 154).
Tanner (1987) introduced three theoretical frameworks used in the literature to study clinical judgments in nursing. One involves concept attainment theory and decision theory; at the time of its review limited additional studies were available in nursing. The second involves Bayes' theorem and utility theory, which included two statistical models of decision-making used by physicians (i.e., descriptive to compare clinician's decisions and normative to prescribe decisions). The third involves information-processing theory where problem solving is described as an interaction between a problem solver and the environment of the task, and the experimenter's description of the task. According to the literature, the theory of information processing is consistent in both the concepts of nurses' decision-making and clinical judgments.

According to Tanner (1984), inductive approaches have also been applied to the study of clinical judgment in nursing. Tanner highlighted what Benner and Tanner call a "grasp of the whole situation" which adds a qualitative or perceptual assessment based on a combination of input from the senses and interpretation of the patient's physical, verbal, and behavioral expressions. This was described as the intuitive grasp characteristic of expert performance.

The outcome of Tanner's (1987) review was to determine that no single theory has been investigated thoroughly enough to conclude that the theory could be supported, refuted, or supported if revised. In summary, Tanner's 1987 review indicated that the concept of clinical judgment is not well defined or understood in nursing. Yet, Tanner's review does introduce intuitive practice within the context of expert nursing practice, a concept that functions as a distinguishing characteristic of decision-making and clinical nursing judgment in this research study. Indeed, the two concepts are not the same. Since the practice of nursing requires nurses continually make clinical decisions (a fundamental, cognitive element of nursing work) and since the concepts of decision-making and clinical judgments are different, it appears that two simultaneous processes are occurring when nurses are making decisions. On the one
hand, decision-making includes the processes nurses use to make decisions; on the other hand, clinical nursing judgment illuminates the characteristics of knowledge, expertise, and intuition when nurses make decisions. For the purpose of understanding the processes nurses use to make decisions, Boblin-Cummings, Bauman and Deber (1999) say there is a series of cognitive activities which have to take place and which take place simultaneously. General agreement exists that problems are identified, that decisions are made about required interventions, and that evaluation may or may not occur.

Furthering Tanner's work, Shamian (1991) suggests clinical judgment is a complex process that uses an enormous knowledge base in combination with certain decision-making processes in order to arrive at desired decisions regarding patient care. Clinical decision-making derives from a sound understanding of the knowledge base and is used to select and combine facts appropriately from this knowledge base. Yet, as previously alluded to, Whittemore (1999) suggests that the nature of knowledge is more than seeking factual information: “It is an elusive discovery, ever changing and developing, whereby abstract thought is linked to perceptions, facts, and truths. Knowledge is a highly sophisticated integration of the moment with the processes of the mind. This integration is essential for one to be able to act knowledge” (Whittemore, 1999, p. 365).

In linking the components of pain management, nurses’ decision-making and clinical judgment knowledge form a basic foundation. According to Ferrell et al. (1991) even when nurses do have adequate pain management knowledge, frequent and difficult decisions must be made, which further suggests that we do not understand the decision-making processes. The literature is consistent in the assertion that additional nursing research is required to understand the decision-making processes nurses use to make patient care decisions about pain management.
Intuition and Expert Nursing Practice

Benner and Tanner (1987) argue that intuition is a legitimate and essential aspect of clinical judgment and that intuition distinguishes expert human judgment from the decisions that might be made by a beginner or machine. Intuition is defined as “understanding without rationale” (p. 23). Six key aspects of intuitive judgment include pattern recognition, similarity recognition, common sense understanding, skilled know-how, sense of salience, and deliberative rationality (Benner, 1984; Benner & Tanner, 1987). In their pilot study related to intuition in clinical judgment, Benner and Tanner noticed a recurring theme about “knowing the patient”—a reference to the way nurses understand the patient, grasp the meaning of a situation for a patient, and/or recognize a need for a particular action (Benner & Tanner, 1984; Tanner, Benner, Chesla, & Gordon, 1993).

Murray (1992) set out to determine the ways nurses evaluate patients’ needs for post-operative narcotic pain relief and what criteria confirm a decision to administer narcotic analgesia. She described and applied two types of behavioral decision theory to clinical judgments: normative and descriptive. Normative models “attempt to provide a set of rules about how decision makers go about making decisions; descriptive models try to describe how people actually make decisions by focusing on the psychological underpinning of observed decision behavior” (p. 11). Murray used a normative model to describe how nurses decide whether narcotic pain relief is warranted. Findings in her study revealed that "type of surgery" as indication of the greatest need. She found nurses still refer to patients by diagnosis rather than by patient name; she also found participants did not accept pain as a subjective phenomenon. Murray interpreted these findings saying that "nurses' decision making conformed to the sanctioned, conservative, medical approach" (14). She added, "further research is needed to determine to what extent this is because of valued technical, scientific, objective types of assessment."
Tanner, Benner, Chesla, and Gordon (1993) reiterate the importance of clinical nursing knowledge - "the tacit embodied, know-how that allows for the instantaneous recognition of the patterns and intuitive responses that characterize expert practice" (p. 274). These authors conducted an interpretive phenomenological study to examine the development of expertise with a sample of 130 intensive care nurses. The purpose of the study was to describe analyses of nurses to determine what it means to know the patient and what difference knowing the patient makes in nursing practice. Several phases of data analysis occurred. These included interpretive summaries of interview transcripts, observational notes, themes derived from background frameworks, pilot work, and earlier interpretive summaries. The findings in this study suggested that knowing the patient meant both knowing the patient’s typical pattern of responses and knowing the patient as a person. Of particular interest are the authors' acknowledgement that it is difficult for nurses to know their patients due to organizational and economics constraints in nursing practice. Safe and astute nursing care is undermined when nurses work in situations where it is impossible to know their patients sufficiently, to see changing relevances, to recognize early warnings, or to protect patients from violation of patient/family concerns or threats to their vulnerability. According to Tanner et al. (1993), the consequence of these situations is that nursing is reduced to technology and nurses lose their practical knowledge of "knowing their patients" (p. 279). One of the long-term consequences of reengineering professional nursing practice is the threat to clinical knowledge development (Benner, Tanner & Chesla, 1997).

Benner, Tanner, and Chesla (1996) define clinical judgment as "the ways in which nurses come to understand the problems, issues, or concerns of clients/patients, to attend to salient information, and to respond in concerned and involved ways; included in our understanding of the term is both the deliberate, conscious decision-making characteristic of competent performance and the holistic discrimination and intuitive response typical of proficient and expert performance" (p. 2). The intent of these authors was to
expand the possibilities of expert nursing practice by attending to the notion of "thoughtless mastery of the everyday." According to Benner et al. (1996), much of expert nursing practice is being accustomed to the subtle changes in clinical situations, attending to the most important information, and understanding and responding to patients' issues or concerns without any conscious deliberation at all. The authors say, "Expert practice is characterized by increased intuitive links between seeing the salient issues in the situation and ways of responding to them" (1996, p. 142). The development of an expert nurse is a gradual process (Benner, 1984; Benner, Tanner, Chesla, 1996; Benner, Tanner, Chesla, 1997).

Benner, Tanner, and Chesla (1997), in their research entitled "The Social Fabric of Nursing Knowledge," introduced the significant notion of the power of pooled expertise. According to these authors, nursing knowledge is pooled deliberately, informally, and in dialogue with other nurses who may have alternate vantagepoints. Pooling expertise in clinical situations helps to decrease tunnel vision and snap clinical judgments and is a powerful strategy for maximizing the clinical knowledge of the group. Benner et al. (1997), identified six areas in which pooled expertise was integral to the development of good clinical practice:

- "learning to identify signs and symptoms in particular patient populations;
- knowing particular patients and learning to recognize how those patients respond;
- gaining practical knowledge about how equipment works;
- identifying clinical experts with whom you can consult;
- sustaining attentiveness of the group to notice changes in patients; and
- sharing clinical narratives to teach and learn from each other" (p. 16D).

Of particular importance and relevance to this research study is Benner et al.'s (1997) assertion that "science becomes knowledge only in the hands of skilled practitioners who have the opportunity to clarify it and apply it in particular situations" (p. 16D).
A clear understanding of clinical judgment, of nurses’ decision-making, and of how both relate to expert nurses is integral to the conceptual framework for this study. To obtain meaningful data using information processing, the literature recommends that ongoing nursing research involve expert or “skilled” nurses.

**Patient-Controlled Analgesia**

There is a plethora of PCA literature from multiple disciplines including medicine, anesthesiology, nursing, pharmacology, and psychology. The various topics addressed encompass the evolution of PCA and PCA pumps (Sechzer, 1968; Sawaki, Parker, White, 1992; White, 1998; Sechzer, 1971; Ferrante & Covino, 1990; Lefever, 1988; Jones & Brooks, 1990; Pasero, 1999), patient perspective, satisfaction, control and education (Egan, 1990, 1994; Ready, 1990; Koh & Thomas, 1994; Taylor, Hall & Salmon, 1996; Badner, Komar & Craen, 1997; Griffin et al, 1998; Pasero, 1999), PCA safety, potential complications and side effects of opioids (Fleming & Coombs, 1992; Woodhouse et. al, 1996; Brown et, al, 1997; Eade, 1997; Gan et. al, 1997; Motamed et. al, 1998; Pasero, 1999; Sidebotham, et al., 1997), intravenous PCA versus intramuscular PCA (Snell, Fothergill-Bourbonnais, Durocher-Hendriks, 1996), the economics of PCA (Choiniere, Rittenhouse, Perreault, Chartrand, Rousseau, Smith & Pepler, 1998), and nurses’ adoption of PCA (Clarke et al, 1994; Fulton, 1996). In light of the tremendous amount of literature, this review is limited to a cross section of material focusing on landmark studies and reviews of four of the six aforementioned topics. Despite the abundance of general PCA literature, there is a dearth of specific research studying the nursing role and perspective related to IV PCA practice that provides the rationale for this study.

**Evolution of PCA and PCA Pumps**

PCA is a pain modality that has evolved from a theory proposed by anesthesiologist Philip H. Sechzer in 1965 (Sechzer, 1990). According to Sechzer, the concept of PCA is an extension of operant
psychology where the behavior of patients controlling their own analgesia is analogous to that of an animal terminating a painful stimulus by pressing a bar.

Between 1966 and 1968 Sechzer developed and implemented the first on-demand apparatus to treat postoperative pain. Sechzer’s early pioneering work on PCA evaluated the analgesic response to small IV doses of opioid given on demand by nurse-observers (Sechzer, 1968). Although this on-demand analgesia system provided improved pain relief with smaller total drug dosages, the delivery system of repeated IV-bolus doses by nurses proved to be impractical because of the demands that it placed on nursing personnel (White, 1988). Sechzer foresaw an active and vital role for nurses participating in this new pain modality. Nurses would need to be responsible for monitoring patients with respect to four criteria. These criteria were (a) maintenance of patient safety, (b) proper pump functioning, (c) sufficient analgesia, and (d) recording physiologic (e.g., vital signs) and psychological data (e.g., pain scores) (Sechzer, 1990).

Sechzer’s (1968, 1971) pioneering work tackled the human pain problem by applying operant conditioning techniques in the postoperative patient population. Sechzer theorized that measures of pain and pain relief could be objectively measured, new methods of pain and pain relief could be studied, and new analgesic drugs could be tested by using this so called new pain intervention. A small sample size of twenty patients was observed postoperatively for 15-48 hours. Patients pushed the analgesic-demand button, and an IV opioid was administered. Nurse-observers were responsible for recording the results of drug administration. The results of this study indicated that each patient was consistent with him or herself in analgesic-demand but that each patient varied significantly. Furthermore, in relation to pain, these results indicate that in general, postoperative pain is cyclical, varied among patients, and consistent in each patient barring complications. In his research, Sechzer (1971) defines pain in the context of
operant behavior, where behavior is ascribed to past consequences that can be predicted based on the probability existing between a response and a consequence.

Research about demand analgesia continued through the late 1960s and prototypic demand-analgesia devices evolved culminating in the available ability of the first commercial PCA device in 1976. Evolution of these devices included the work of Sechzer, Forrest (Demand Dropmaster), Keeri-Szanto (Demanalg), and investigators at the Welsh National School of Medicine, Cardiff Wales (Cardiff Palliator) who marketed the first commercial device (White, 1988; Ferrante & Covino, 1990). PCA was first recognized internationally in 1984 when regulatory approval of PCA pumps for use in hospitals was acknowledged (Owen & White, 1992). Further review of the advancement and sophistication of PCA pumps is beyond the scope of this paper.

**Potential Complications of PCA**

Fleming and Coombs (1992) identified that up until this point in time, there were no large population studies done examining the frequency and types of complications associated with PCA. Believing that an awareness of this information was of paramount importance to safe, effective delivery of PCA, Fleming and Coombs undertook an extensive study to document suspected complications of PCA. Over a one-year period, they reviewed the documentation of 1122 patients who received PCA. They were looking for development of respiratory depression requiring narcotic antagonist or artificial airway support, uncontrolled pain due to device malfunction or human resource failure, and/or the occurrence of a fatal drug reaction or unexplained death of a patient under care by the pain service.

Fleming and Coombs’ (1992) findings indicated no postoperative deaths but noted eight significant complications (i.e., they required intervention). The complications were related to either a drug overdose or drug interaction. Specifically, known side effects of opioids were disclosed in this patient population and included respiratory depression, seizure, hypotension, hallucination and somnolence,
allergic reaction to opioids, interactions with other drugs, nausea and vomiting, decreased intestinal motility, and urinary retention. On the whole, three broad categories were cited in relation to overdose and side effects, which included excessive opioid administration, synergistic interaction between opioid and other medications and sensitivity to the side effects of opioid even at low doses. The overall complication rate was low (8/1122=0.7%) but significant enough to warrant further investigation on a broader scale with more rigorous research techniques. Even though the incidence of complication appears low, the significance is that serious complications do exist. The authors assert, “At a minimum, patients using these pumps require closer respiratory and analgesia monitoring” (Fleming & Coombs, 1992, p.468), for these observations can go undetected with inexperienced staff and/or slack supervision (Fleming & Coombs, 1994).

In 1997, Sidebotham, Dijkhuizen, and Schug conducted an even larger study, reviewing 6035 patients treated with PCA over a seven-year period. Again, the overall incidence of potentially life-threatening complications was low (0.28%). Nonetheless alarming degrees of hypoxemia and bradypnea were identified. Sidebotham et al. noted that as PCA has become more widely used, technical problems with the PCA modality have become more evident.

In summary, Sidebotham et al. (1997) state that those most at risk to go on to develop serious complications are those experiencing hypoxemia (SpO2 < 89%) or respiratory depression (respiratory rate < 8/min). Given that these patients can be identified, risks can be minimized by the appropriate use of PCA protocols and by specifically looking for ventilatory insufficiency in these patients by appropriately trained staff. These authors conclude that even though the incidence of potentially life-threatening complications with PCA is low, “worrying degrees of arterial desaturation and bradypnea still occur, and there is little room for complacency and a need for ongoing vigilance” (p. 208).
Motamed, Spencer, Farhat, Bourgain, Lasser, and Jayr (1998) conducted a comparative, randomized, prospective, postoperative study of 60 patients undergoing major abdominal surgery for cancer. Thirty patients received continuous extradural infusion of 0.125% bupivacaine, 12.5 mg and morphine 0.25 mg (EXI group) and 30 patients received PCA with intravenous morphine (1-mg bolus, 5-min lockout, and 4-hour maximum dose 20 mg). The purpose of this study was to compare postoperative arterial hemoglobin saturation, pain relief, sedation and patient satisfaction in these two groups of patients receiving either postoperative PCA with IV morphine or continuous extradural infusion of bupivacaine and morphine while breathing room air. Once again, these investigators identified that the potential side effect of respiratory depression on surgical nursing units exists with all opioids regardless of the route of administration. Since PCA allows patients to self-administer opioid themselves, a sedated patient is less likely to press the button which indirectly reduces the dose of opioid and the risk of postoperative hypoxemia. Previous studies have monitored arterial oxygen saturation during the first postoperative night but no studies have monitored arterial hemoglobin oxygen saturation continuously for 2 consecutive nights after major abdominal surgery (Motamed et al., 1998). These investigators claim that desaturation episodes may be worse during the second postoperative night thus necessitating prolonged postoperative monitoring using these treatment modalities (Motamed et al., 1998).

A potential limitation of the Motamed et al. (1998) study is observer bias because the study was not double-blinded. However, the authors applied strict, predetermined criteria to measure physiological variables, which were collected and analyzed by computer, thus diminishing this confounding variable (Motamed et al., 1998). Three patients were excluded from this study due to severe oxygen desaturation leaving a total of 57 patients for data analysis.

Motamed et al. (1998) found that with respect to pain relief, continuous extradural analgesia with a combination of local anesthetics and opioids provides superior and sustained pain relief compared to
parental opioid PCA on its own. There was no difference in satisfaction; the slight percentage of PCA patients more satisfied was not found to be statistically significant. There were no differences in sedation scores. Moderate postoperative arterial hemoglobin desaturation was more frequent among patients receiving extradural analgesia compared with those receiving parenteral PCA. Although the continuous extradural analgesia with a combination of local anesthetics and opioids provides superior and sustained pain relief, this delivery system also carries with it a risk of late respiratory depression because of systemic of CSF absorption of opioids even though the incidence is low (0.09-0.2%). Furthermore, extradural analgesia may also cause longer periods of desaturation meaning that prolonged monitoring is important because hypoxemia may be worse on the second postoperative day and can last up to 5 days (Motamed et al., 1998). However, Motamed et al. (1998) did not find in the continuous extradural infusion group (EXI) that moderate desaturation was worse during the second night compared to the first night. The study is worth mentioning because the potential for hypoxemia leading to respiratory depression does exist when administering opioids either parentally or extradurally. The fact that oxygen desaturation occurred less frequently in the PCA group does not mean that oximetry is not a valuable tool to be used to monitor these patients. In fact, perhaps it is the combination of all four monitoring variables (pain scale, sedation scale, pulse oximetry and patient satisfaction) that supports assessment and decision-making in relation to preventing postoperative respiratory depression with these interventions. A criticism of this study is that the authors did not provide any implications for practice; nor did they identify any recommendations for further research studies.

In summary, a review of the PCA literature related to the potential complications of PCA indicates that although the incidence of complications is low, potentially life-threatening complications can and do occur. Since the potential for morbidity and mortality outcomes in PCA therapy exist, it is absolutely vital that this patient population receives close monitoring and intervention, as deemed necessary, by trained
and experienced staff who are guided by state-of-the-art standards of practice and close supervision. This finding in the literature is extremely relevant to this research study because it contradicts initial PCA marketing, which claimed that fewer analgesic side effects occur when utilizing PCA therapy. This marketing information, in light of this literature review, is untrue and has misled practitioners in development of PCA programs.

**Patient Perspective, Satisfaction, and Control**

Ready (1990) asked the following question: “Patient-controlled analgesia – does it provide more than comfort?” (p.719). Ready acknowledged PCA as a major advancement in treating postoperative pain while identifying that there are unknown economic factors associated with its use in relation to postoperative morbidity and to the context of overall savings in health-care dollars. Ready suggests that government agencies and insurance companies will most likely question compensation to hospitals and anesthetists who care for patients receiving PCA, particularly if the benefits of superior analgesia associated with PCA do not outweigh the costs of PCA therapy. Ready notes that the benefits associated with PCA use most likely occur because of the technique itself, but patients are also dependent on practitioners who are knowledgeable and skilled in its use. Ready states that “there is a widespread misconception that pain relief with PCA is completely automatic. In fact, PCA can only be used optimally when it is accompanied by regular, expert nursing and medical supervision” (p. 720). His study leaves the question, What does regular, expert nursing supervision mean in the context of everyday PCA usage?

Egan (1990) asks the following question in the context of PCA: “What does it mean to a patient to be in control?” (p. 17). Egan explores the concept of control and the reality of acute postoperative pain by summarizing a typology of control and reviewing clinical and laboratory research on the concept of personal control. Egan cites the work of Averill who proposed three types of personal control: behavioral
control, cognitive control, and decisional control. Behavioral control is “the availability of a response that may directly influence or modify objective characteristics of a threatening event” (p. 18). Cognitive control “involves the way in which a potentially threatening event is interpreted or appraised so as to affect associated distress” (p. 18). Decisional control is “the opportunity to choose among various courses of action” (p. 18). Behavioral control occurs in response to an aversive event such as acute postoperative pain and is further classified as regulated admission and stimulus modification. In relation to postoperative pain, regulated admission “refers to control over circumstances surrounding the experience of pain, such as control when it occurs." Stimulus modification “refers to the individual’s ability to modify the actual pain level, as in the use of self-administered medication.” The definition of stimulus modification is consistent with Sechzer’s thinking in relation to the concept of PCA (Sechzer, 1971; 1990).

Egan (1990) selectively reviewed the control literature originating predominantly from laboratory studies. The preference for control can be marked by individual differences ranging between the availability and responsibility of control causing stress to the perception of not being in control causing anxiety. Rotter’s locus of control theory (Egan, 1990) has been applied to health and illness responses. Using Rotter’s classification, people with an external locus of control believe that they have no control over their own health and must rely on influential others. An additional view to describe individual differences in preference for control is Seligman’s model of learned helplessness (Egan, 1990). In this model, individuals experiencing a depressive personality style may be less motivated to exercise control over their environment.

According to Averill’s typology (Egan, 1990), the modality of PCA gives patients both behavioral control and decisional control. Behavioral control, since the patient engages in an active behavior which has an effect on the outcome for the patient such as the patient’s subjective acknowledgement of a pain
level, and decisional control because the patient is given the right to decide whether or not to push the button. Restoring patients' control over pain during postoperative pain management appears a viable option to help them lower their suffering and distress (Egan). However, according to Egan's selective literature review related to the concept of control, not all patients may need or desire to be in control of their pain. In fact; Egan clearly articulates that one cannot assume that the need for control is beneficial to all patients. Egan's work is particularly pertinent to this research study because it contradicts initial PCA marketing which claimed that PCA was a superior modality because it placed the patient in control of their own pain. This marketing strategy was only partially true since there is a percentage of the PCA patient population who do not choose to be in control of their own pain. Accordingly, patient choice needs to be considered and respected when preliminary decisions are made in the patient-physician-nurse triad in relation to placing a patient on PCA therapy.

Taylor, Hall and Salmon (1996) attribute the widespread use of PCA to both the belief that it allows patients to self-titrate analgesia to pain in a finer way than the traditional intramuscular administration of opioids and to the assumption that patients value PCA because of the control it affords them. However, prior to Taylor et al.'s study, there were no objective patient data to evaluate this view. This is an important, landmark qualitative study because it is the first systematic description of how, in practice, PCA is perceived by patients who receive postoperative PCA. The method is aimed at categorizing and organizing the elements of patients' accounts by using exploratory interviews with content analysis grounded in the data.

Taylor et al. (1996) randomly approached twenty-six, postoperative patients who had received PCA for postsurgical pain. In addition to receiving postoperative PCA, Diclofenac (100 mg) was also prescribed either orally or rectally and the first dose was given at the completion of surgery. The results of this study, in relation to the patients' comments were divided into three main categories: (a) evaluation, (b)
interaction of PCA with nurse-patient relationship, and (c) implications of PCA for control over pain. Taylor et al. (1996) found that patients’ experiences with PCA are not consistently positive and in fact, were negative related to perceived effectiveness and to its side effects such as nausea. Furthermore, the view that PCA is a vehicle for providing control over pain-relief demonstrated that control is not necessarily perceived to be a salient or positive dimension of health care in this PCA patient population.

Of significance in the Taylor et al. study is the investigators’ criticisms that the concept of control associated with PCA is flawed and contradictory. Control over analgesia was complicated by the recognition that the object of control was not exclusively pain-relief, but rather the titration of analgesia against side effects or against the imagined consequences of over-use which PCA shares with conventional analgesia. Also, patients were aware of the PCA pump’s programming restrictions which meant that some patients feared that its finite contents might be used up by frequent use; others recognized that the PCA pump’s power was not autonomous but derived from the experts that had set it up. In this regard, PCA represented a passive acceptance of a machine’s autonomy of expert’s authority rather than taking control over one’s pain treatment. Taylor et al. (1996) also found that patients prefer responsibility for their analgesia to remain with doctors and nurses. Therefore, the results in this study suggest that the concept of “control” in PCA therapy is more accurately a professional and theoretical creation than a dimension of patients’ PCA experience.

A major implication in the Taylor et al. (1996) study is that from the patients’ perspective, PCA is not consistently positive, which casts doubt on the validity of the concept of control. PCA has an important impact on the nurse-patient relationship where PCA can only be understood in the context of nursing care. Taylor et al. found “conflict typically involved what the patient saw as nurses’ inability or unwillingness to accept the responsibility of pain relief, attributing it to the PCA machine which they were
powerless to question or override. This illustrates how PCA can serve in a way in which the professional can shift to the patient the responsibility for their own welfare” (p.1143).

In summary, a review of the literature related to patient perspective, satisfaction, and control indicates the earliest qualitative study from the patients’ perspective was only published in 1996 (31 years following Sechzer’s proposed PCA theory). This time-lapse is alarming in that PCA was initially marketed to health care professionals in the early 1990’s as a pain modality that placed the patient in control of their own pain. According to this literature review, the marketing strategy of PCA is contradictory and flawed. In fact, evidence in the literature suggests compensation may not be forthcoming for patients who experience morbidity and mortality outcomes related to PCA therapy particularly if the benefits of superior analgesia associated with PCA do not outweigh the costs. Furthermore, the literature suggests that expert nursing and medical attention is required to provide safe care to this patient population rather than what has been perceived as a widespread misconception that PCA is completely automatic in practice.

Nurses’ Adoption of PCA

Research examining adoption of PCA in nursing practice is limited. One comprehensive study is that of Clarke et al. (1994). The purpose of this study was to examine nurses’ learning needs in bringing about effective and efficient implementation of a PCA approach within the complexity of decision-making about pain management. Three project goals of this study were to (a) increase understanding of the factors which influence nurses’ adoption or rejection of PCA; (b) make recommendations for nursing education and administration for the successful implementation of a PCA approach to pain management; and (c) evaluate the Participatory Action Research (PAR) model used in this study.
At the initiation of the study, many unknown variables existed in relation to the nurses' values, goals, and experiences influencing their innovation adoption behavior of PCA therapy. Also, organizational contextual factors potentially affecting the nurses’ behaviors were not well recognized.

The conceptual framework chosen in the Clarke et al. study was the concept of innovation adoption since PCA is an example of a technological innovation for pain control (Clarke et al., 1994; Maxwell, 1995). An innovation is an idea, practice, or objective that is perceived as new by an individual, a group, or an organization (Romano, 1990). According to Romano (1990), the existence of technology per se does not guarantee it will be adopted or incorporated in an environment. Furthermore, the probability of an innovation being superior to previous practice is typically unknown. Clarke et al. state “it is imperative to understand the staff nurses’ perspectives on and experiences with PCA, so that relevant resources might be identified and made available to bring about effective and efficient implementation and maintenance of PCA” (p. 2). The research design used in the Clarke et al. study was PAR, which included a phenomenological approach using moderated focus groups to gather the data by the research participants. The sample consisted of eleven British Columbia health care agencies (on 13 sites) with patient populations from, but not limited to, oncology, rehabilitation, general surgery, orthopedics, pediatrics, maternity, trauma, and burns. Efforts were made to recruit a sample of six to eight registered nurses from each agency to form an agency focus group. However, numbers in each of the focus groups varied due to the complexity of the research process and time constraints. Moderated focus groups were conducted to address four research questions in the Clarke et al. study. Of particular significance in extending Clarke et al.’s research to this thesis is the first question in their study: “How has the introduction of a PCA approach in a health care organization changed (a) nurses’ perceptions of pain management? and (b) nurses’ decision-making?” (p. 5).
With respect to part (a) of their research question, the authors found that “in all agencies, the introduction of this new pain philosophy resulted in the use of new tools such as pain assessment scales and pain flowsheets. In some agencies, the introduction of a new health care service (Anesthetic Acute Pain Services), with unique reporting and relationship structures, occurred concurrently with the introduction of PCA” (Clarke et al., p. 23). In addition, “the forces identified as influencing nurses’ perception of the PCA philosophy and subsequent adoption or rejection of the philosophy was the nurses’ clinical experiences. If nurses perceived positive patient outcomes, the philosophy was more likely to be embraced” (p. 24). This finding is consistent with Benner’s (1984) work that emphasized the importance of clinical experiences in nurses’ clinical skill development along the novice to expert continuum. The nurses also perceived “that elderly patients generally had an external locus of control and preferred the nurses to maintain control of medications” (p. 25). The co-investigators interpreted these nurses’ beliefs as meaning that the nurses retained a traditional pain management philosophy rather than a PCA philosophy (Fulton, 1996). Interestingly, Taylor, Hill, and Salmon (1996) published the first (seminal) qualitative study examining the patient’s perspective in response to the conventional view that patient’s value PCA because of the control which affords them over their treatment. They found that “PCA was only rarely described as a way of gaining control over analgesia and, in general, this was not valued” (p. 1137). In light of Taylor et al.’s (1996) findings, an alternative critical analysis of Clarke et al.’s (1994) findings suggests that these nurses had an intuitive grasp of this PCA patient population, as opposed to being labeled as retaining a traditional pain management philosophy.

Part (b) of Clarke et al.’s (1994) research, relating to changes in nurses’ decision-making, identified that nurses’ decision-making changed in process, content, and necessary background knowledge needed to support new ways of deciding. Nurses described how the process of assessing pain became more sophisticated with the introduction of the PCA approach. They used more factors to make
assessments than in the past. For example, pain assessment scales and pain flowsheets were introduced into practice with PCA therapy. Nurses frequently discussed the application of these assessment scales and flowsheets to their nursing process, saying they perceived the PCA program provided them with more flexibility in managing the patients’ pain in such areas as the use of ranges of medication doses; involvement in the weaning off of PCA therapy; the clarity of expectations of nurses’ responsibility; and the availability of more objective pain tools with which to communicate to physicians about patients’ pain levels. Nurses believed that they were more objective in their decision-making following the introduction of PCA programs.

With respect to changes in the content of decision-making in the Clarke et al. (1994) study, nurses were concerned that physicians were unilaterally selecting patients for PCA without nurses’ input. Nurses believed that they were in a superior position to make such decisions and wanted involvement in the PCA selection process. Nurses challenged the direction given about when to discontinue PCA therapy because they had trouble getting anesthetists to take patients off PCA therapy. In one organization, staff had difficulty obtaining adequate physician’s orders for oral PCA. In effect the process of initiation and/or termination of the PCA approach was perceived to affect positive patient outcomes when nurses were not directly involved in the decision-making process. Nurses also identified a need to learn more about pain management in general and specifically about pharmacology. They found themselves trying to advise physicians upon ideal doses of medications without necessarily having enough knowledge to do so comfortably.

Further examination of Clarke et al.’s (1994) recommendations, specifically, recommendation #13 states, “provide information about medications used in PCA at outset of program” (p. 52). Considering the outcome of the literature review on acute postoperative pain management, the recommendation may not be sufficient or strongly enough worded to meet the requirements of adequate nursing knowledge.
fact, the nurses in the Clarke et al. (1994) study intuitively knew that they specifically needed to learn more about PCA pharmacology. This is consistent with findings in the literature review in this study.

Despite the fact that the PCA program has been in existence in my place of employment for the past seven years, these findings now seem vague and superficial; they seem to “skim the surface” of understanding about nurses’ day-to-day decision-making in PCA practice.

Limitations to the Clarke et al. (1994) study may be attributed to health care reform and restructuring processes that were occurring in the province of British Columbia concurrently as a result of the Royal Commission’s “Closer to Home Report.” Due to the magnitude and complexity of this process, it is not known to what extent these changes taking place in the health care environment may have affected implementation of PCA in each of the respective agencies. A further limitation was the limited experience of the co-investigators with PAR and the use of focus groups as the main source of data. The Clarke et al. study laid the foundation for further study of nurse’s adoption of PCA in this research study particularly since no other relevant studies besides this one was found in the literature review.

**Summary of Literature Review**

The purpose of the literature review in the method of interpretive description is to critically examine existing knowledge in order to construct an analytic framework on which to build a qualitative design and to prevent “going in blind” (Thorne et al., 1997). The framework in this study provides a beginning, foundational forestructure to answer the research question, “how do nurses manage acute postoperative pain in the adult patient population using the modality of IV PCA including decision-making around initiating, maintaining and discontinuing pharmacological IV PCA?” Because the amount of literature addressing the topics of study is overwhelmingly immense, it has been limited to a selection of classic, current, landmark research involving each of three broad concepts. Each concept has been reviewed and critically examined during this literature review. The analytic framework for this study
Figure 2: Schematic Representation of Analytic Framework

- **ACUTE POSTOPERATIVE PAIN**
- Nursing Knowledge of Pain Management
- Physicians' Standing PRN Orders
- Pain Management with IV PCA Outcome
- EXPERT PCA NURSES
- DECISION-MAKING
- CLINICAL JUDGMENT
- Nursing Knowledge of IV PCA
evolved from analysis of the following concepts: (a) acute postoperative pain, (b) nurses' decision-making and clinical judgment, and (c) PCA (see Figure 2). This analytic framework directed the research study. The framework is revised in Chapter Five based on the research findings.

The global issue in this study's research question is nurses' decision-making in acute postoperative pain where the instance of PCA therapy is one example. The outcome of initially reviewing the concept of nurses' decision-making in the context of this question was that decision-making was somewhat ambiguous which necessitated an additional review of the concept of clinical nursing judgment. By reviewing both of these concepts, it became clear that decision-making pertains to how people make decisions, that is, the processes they use whereas, clinical judgment involves the eclectic combination of nurses' assessment, diagnosis, interventions, and intuition during complex decision-making processes. In addition, Grier (1984) recommended that future nursing research should identify skilled nurse decision-makers and describe their information processing strategies rather than focus on identifying nurses' deficiencies in processing information. For these reasons, the sample population (i.e., problem-solvers in this study) will involve expert nurses in PCA therapy, and the nature of the task will involve the management of acute postoperative pain using the modality of IV PCA in day-to-day clinical practice.

Acute postoperative pain management is inadequate and ineffective in nursing practice. Factors contributing to these sub-optimal pain management practices are attributed to patients' and providers' attitudes, nurse and physician knowledge, organizational settings, systems issues, regulations and/or a combination of all of the above. Publication and dissemination of the first Clinical Practice Guidelines was a global attempt to address these issues. However, the availability of clinical practice guidelines alone does not guarantee their adoption in nursing practice.

Nurses are responsible for the administration of opioids within the context of physicians' standing prn orders. The intent of physicians' standing prn orders is to give nurses wide latitude in decision-making
in relation to dosing opioids. There is evidence in the literature that nurses do not fully understand the meaning of physicians' standing prn orders, which may contribute to ineffective pain management practices. A compounding factor of nurses administering opioids within the context of physicians' standing prn orders is that physicians may lack pharmacological knowledge about therapeutic opioid dosing ranges; they may lack an understanding about addiction and overestimate the dangers of addiction leading to undertreatment and patient distress. Whatever the reason, physicians are continuing to underprescribe opioids. Even more troublesome is that physicians have legal and prescriptive authority for prescribing opioids while nurses have responsibility for administering opioids especially when nurses may or may not comprehend the full context of physicians' orders.

Nursing knowledge is a contributing factor to pain management practices and involves knowledge deficits regarding opioid pharmacology (i.e., appropriate doses, side effects, and duration of action). Nursing knowledge related to pain assessments is inconsistent, haphazard, loosely drawn together, and subjective. Nursing expertise does not influence pain assessments; while experts may not make better decisions, they may make decisions faster. Nursing knowledge is an important precursor to decision-making and both nursing knowledge and decision-making are intimately linked to pain management.

With respect to nursing documentation, which is a reflection of nursing practice, wide variations in practice exist which encompass inconsistent, sporadic and fragmented pain management practices. The outcome of these practices is that inadequate databases inhibit effective nurses' decision-making within and across nursing shifts leading to gaps in nursing pain management. In essence, nurses are undermining effective pain management practice as well as failing to meet minimum practice standards in relation to pain management. For example, Joel (1999) makes a powerful allegation that these nursing pain management practices are in fact, negligent.
Analysis of the PCA literature reveals that the PCA program is flawed. A critical point about PCA is that erroneous marketing was used to promote the modality in its inception. All of the three tenets of PCA have proven false: that patients want to be in control of their own pain management; that PCA will reduce nursing time; and that PCA will have fewer adverse effects than traditional pain management modalities. Following analysis of the results of the literature review and using the direction given for an analytic framework for the purpose of an interpretive description, data collection began from the participants in this study according to the following five themes:

1. information regarding general categories of acute postoperative pain management;
2. information regarding the specifics of IV PCA therapy;
3. details regarding decision-making;
4. specifics of nurses' understanding of physicians' standing prn orders; and
5. factors which are considered when initiating, maintaining and discontinuing IV PCA therapy.

Traditionally, acute postoperative pain has been an acceptable outcome of surgery. Today, acute postoperative pain is a serious complication of surgery. Further nursing research is necessary if PCA is to be appropriately used and promoted as a safe and viable pain management modality for nursing.

**Analytic Framework**

Figure 2 represents a schematic representation of the Analytic Framework for this research study to answer the research question, "how do nurses manage acute postoperative pain in the adult patient population using the modality of IV PCA including decision-making around initiating, maintaining, and discontinuing pharmacological IV PCA therapy?" Clearly, nursing’s interpretive description is located within existing knowledge so that findings can be constructed on the basis of thoughtful linkages to the work of others (Thorne et al., 1997). Inherent in this cyclical, interrelated process is the essence of nurses’ decision-making and clinical judgments based on nursing knowledge of acute postoperative pain and
nursing knowledge of PCA and acted upon within the context of physicians’ standing prn orders. All of these processes are occurring simultaneously and at the moment in order for nurses to act knowledge. Acting knowledge is required for effective pain management by nurses. Whittemore offers that “Acting knowledge is a process whereby one is fully engaged in the moment, in the experience, and in the patient, attentive to all the cues, and then responding decisively with clarity of thought and exemplary reasoning. Acting knowledge is knowing what to do when, doing the right thing at the right time, and knowing the limits of knowledge. Acting knowledge is keeping centered on the perspective and the purpose of actions, linking the known of this intellectual process with the known of the individual” (Whittemore, 1999, p.366). According to Thorne et al., the analytic framework represents a beginning point rather than an organizing structure for what was found in the inquiry. The analytic framework will most likely be challenged as the inductive analysis proceeds. However, because it is explicit in the description of this work, it provides a solid basis upon which the design logic and inductive reasoning in interpreting meanings within the data will be judged (Thorne et al., 1997).

Summary

Chapter Two critically reviews and examines existing literature in the context of the research question towards the development of an appropriate platform on which to build a qualitative design. The method of interpretive description requires that the research question be located within existing knowledge so findings can be constructed on the basis of thoughtful linkages to the work of others (Thorne et al., 1997). The research question in this study—How do nurses manage acute postoperative pain in the adult patient population using the modality of IV PCA including decision-making around initiating, maintaining, and discontinuing pharmacological IV PCA therapy?—directed me to explore literature related to the concepts of acute postoperative pain, nurses’ decision-making, clinical judgments, and PCA. The literature review is limited to a selection of classic, current, and landmark research
involving each of four broad concepts. Chapter Two ends with a description of the study’s analytic framework, (it served in my research as a beginning point for what was found in the inquiry) and a schematic diagram representing nurses’ decision-making based on the researcher’s interpretation of the literature.

There is a need for further nursing research to fully understand the factors that influence nurses’ decision-making in acute postoperative pain using the modality of IV PCA. The research method of noncategorical interpretive description will be used to explore and describe these factors in order to provide useful direction for furthering nurses’ knowledge and science in the care and management of patients receiving IV PCA therapy.
CHAPTER THREE: RESEARCH METHOD

A gap in nursing knowledge exists in relation to understanding the decisions nurses make and the factors influencing those decisions regarding patients' experiences of acute postoperative pain using the modality of IV PCA in everyday nursing practice. The purpose of this study was an attempt to reduce this knowledge gap. After exploring numerous research design options, I chose the qualitative method of interpretive description (Thorne, Kirkham & MacDonald-Emes, 1997) as the most appropriate method to guide this study. This chapter outlines the rationale for selecting this research design, provides a description of the design, the sample and setting, and the procedures for data collection and analysis. This chapter also reviews rigor, potential limitations of the study and ethical considerations.

Research Design

Rationale for Selecting Research Design

I chose the research design of interpretive description (Thorne, Reimer-Kirkham, MacDonald-Emes, 1997) because I wanted to contribute to and advance nursing knowledge and influence nursing practice. The method of interpretive description is both grounded in, and appropriate for, the generation of nursing knowledge. The goal of interpretive description is to develop nursing knowledge that reflects what is known about aggregates of persons (i.e., nurses in this study). Specifically, interpretive description allows the researcher to explore a research problem, formulate a description, and engage in interpretation of the experience from the perspective of nurses who live the experience. For example, the responses of the research participants provided a description of their experiences. These descriptions were interpreted based on the researcher's sources of knowledge, experience and decision-making. The researcher was permitted to “create sound interpretive description that contributes directly to our understanding of how people experience their health and illness and what nursing can do to make a difference” (Thorne et al., 1997, p. 173). This was possible because the researcher connected with the
study participants to interpret their lived experiences in nursing practice. Since little is known about the decisions nurses make and the factors influencing those decisions in acute postoperative pain management using the modality of IV PCA, this research method was appropriate for investigating these previously unexplored areas.

The method of interpretive description targets the specific needs of the nursing profession as opposed to borrowing a method from another discipline. According to Thorne et al. (1997) nurse researchers traditionally aligned themselves among legitimized philosophical and methodological research designs such as phenomenology (philosophy), grounded theory (sociology), and ethnography (cultural anthropology) since methodological variation from these traditions was not encouraged in academia. Thorne et al. (1997) purport that it may be an appropriate time in nursing's history to consider the method of interpretive description as a credible and legitimate way to access nursing knowledge. This research study used an interpretive design because of its applicability to answering the research question in the study. It is hoped that utilization of this method will begin the process of legitimizing nursing science (Thorne et al., 1997) specifically, in relation to nurses' decision-making in acute postoperative pain management using the modality of IV PCA in day-to-day clinical practice.

The outcome of critically analyzing and synthesizing relevant literature pertinent to the research question gave rise to the development of the analytic framework outlined in the Chapter Two (see Figure 2). The cyclical, interrelated parts of the framework directed the selection of the sample population (e.g., expert nurses in PCA therapy), data analysis, and rigor in the proposed study. It was expected that this framework would be challenged as the inductive process proceeded, since it provided a beginning point upon which decisions about the research design were made rather than an organizing structure for what would be found in the inquiry (Thorne et al., 1997).
Sample and Setting

I received approval from the Vice President (VP) Patient Care and Clinical Services at an acute/tertiary care hospital in the Lower Mainland, British Columbia (Saint Mary’s Hospital, New Westminster) to access nursing staff of Saint Mary’s Hospital following ethical approval for the project from UBC and the hospital ethics committee.

The sample for this project included registered nurses nominated as expert in IV PCA therapy on an acute general surgical nursing unit at Saint Mary's Hospital, New Westminster, BC. The Patient Care Manager, 5th Floor Surgery authorized and supported the research study in clinical practice. The nursing unit, 5th Floor Surgery is the only nursing unit in this hospital that provides IV PCA therapy; therefore, sample selection was limited to this clinical area. According to the organization's IV PCA certification records there were twenty-four nurses certified in IV PCA therapy who met the inclusion criteria; making them all potential candidates for this study. Specifically, six nurses were IV PCA certified in 1992; thirteen nurses were certified in 1993; one nurse was certified in 1994; two nurses were certified in 1996; and two nurses were certified in February 1997. Therefore, it was my estimation that sufficient numbers of potential nominees met the requirements for recruitment into this study.

Sample design in this study necessitated recruitment of expert nurses in IV PCA therapy rather than non-expert or novice nurses in the sample (i.e., those with little experience, but having IV PCA certification). I specifically chose this sample design based on recommendations in the literature review. Rationale to support the sample design of expert IV PCA nurses in this study was based on the following:

- Grier (1984) emphatically suggested that future nursing research should identify skilled nurse decision-makers to describe their information processing strategies, rather than contemplating identifying nurses' deficiencies in processing information;
• Grier (1984) further suggested that a comprehensive study of skilled strategies could be most productive for improving decision-making skills and for developing new methods for information processing in nursing practice;

• intuition distinguishes expert judgment from novices (Benner et al., 1996);

• expert practice is characterized by increased links between seeing the salient issues in the situation and responding to them (Benner et al., 1996);

• a gap in nursing knowledge exists in relation to understanding the decisions nurses make and factors influencing those decisions regarding acute postoperative pain using the modality of IV PCA as identified in chapter two;

• the objective of this research study was to provide useful direction for furthering nursings' knowledge and science in the management of acute postoperative pain using the modality of IV PCA. In addition, it aimed to assist nurses to develop teaching strategies and/or interventions in order to make expert clinical judgments in the management of IV PCA therapy. Therefore, it was imperative to know what expert judgments in clinical practice are in order to develop teaching strategies and/or interventions and provide new insights into how expert nurses make judgments in everyday practice.

For all of these reasons, I strongly believed that this sample must be limited to only expert nurses in order to contribute to and advance nursing knowledge and influence nursing practice. Expert nurses would have had the opportunity to make decisions regarding physicians' standing prn orders within the context of the physicians' preprogrammed IV PCA orders. According to the literature, nurses differ in their understanding of what a physician's standing prn order means and in general, there is a lack of clarity in relation to what a physician's standing prn order means. One cannot assume that because a nurse is expert in IV PCA therapy that they are also expert in following physicians' standing prn orders in acute
postoperative pain management. Conversely, it may be that in the IV PCA program, the physicians' standing prn orders are in fact, adequate and nurses have sufficient knowledge to intervene on behalf of their patients. According to Benner et al. (1996), "Any individual will have had more experience with some types of situations than with others, a person can simultaneously be an expert with respect to certain types of situations while being less skilled with respect to others" (p. 36). For these reasons, in this study, it was essential to limit the sample to expert nurses to extrapolate the intended data.

Recruitment of the study participants occurred via a letter requesting nomination (see Appendix A) according to personally established criteria. The inclusion criteria culminated as a result of synthesizing a relevant literature review. The general principle of theoretical sampling was employed in the method of interpretive description whereby, sample selection is obtained from the most predictable variations within the theme that are being studied (Thorne et al., 1997). Variations of the theme would not be known until the researcher was fully engaged in data collection and analysis, which meant that the exact sample size could not be accurately predicted prior to the onset of the research study. Following data analysis from the first few participants, theoretical sampling principles further guided the recruitment of human subjects (Morse and Field, 1995). Therefore, theoretical sampling "proceeds through successive stages, which are determined by changes in the criteria for selecting interviewees according to what has been learned from previous data sources" (Morse & Field, 1995, p. 158). In other words, participants were chosen as needed rather than at the beginning of the research study. Data saturation occurred and sampling ceased when no new data emerged (Field & Morse, 1995). I anticipated approximately seven participants being needed to meet the requirements of theoretical sampling and data saturation in this research study. That proved to be a correct estimation.

Thorne et al. (1997) contend that, "people who have lived with certain experiences are often the best source of expert knowledge about those experiences" (p. 174). Therefore, in this research study, the
following inclusion and exclusion criteria were used to identify expert nurses in IV PCA therapy. This lays the groundwork for future research studies including both qualitative and quantitative approaches.

**Inclusion Criteria of Expert Nurses in IV PCA Therapy**

Nurses were considered suitable for the study based on their demographic information, employment characteristics and expertise. Study participation was based on the following criteria:

1. Volunteered to participate in research study;
2. Registered Nurse (RN) employed at Saint Mary’s Hospital, New Westminster, BC;
3. Diploma or baccalaureate prepared RN;
4. Employed on either a full-time or part-time basis;
5. Female or male;
6. Provided direct postoperative patient care to adult patients on an acute surgical nursing unit (5th Floor Surgery at Saint Mary's Hospital);
7. Had been nominated by peers; and
8. Perceived to be an *expert* nurse who met the following criteria:
   
   (a) Had completed the following, six-step incremental IV PCA certification process at Saint Mary's Hospital with the primary IV PCA certifier (myself) and at the learner's own pace. (Nurses do not manage IV PCA therapy in clinical practice in this organization unless they have completed all six steps of this certification process.) Upon completing this process, the RN is judged to be "IV PCA certified" by the primary certifier. The "IV PCA certified" RN may then care for patients in clinical practice receiving IV PCA therapy. The IV PCA certification process has been in effect since 1994; and the six steps are:
   
   - Completes IV PCA learning module (1994)
   - Reviews Tom Fulton video; one-hour and fifteen minutes (1992)
• Participates in a 2-hour teaching session regarding pump technology, standards and documentation with primary IV PCA certifier.

• Completes a return IV PCA pump demonstration with primary IV PCA certifier.

• Observes an IV PCA patient teaching session in Pre-Admission Clinic with Pre-Admission RN certified in IV PCA therapy.

• Provides a return IV PCA patient teaching session with IV PCA primary certifier.

• Is IV PCA certified;

  (b) Had practiced IV PCA therapy in the clinical arena for three (3) years or longer (between 1992 and 1999);

  (c) Had worked with over 100 patients receiving IV PCA therapy.

Exclusion Criteria of Expert Nurses in IV PCA Therapy

The sample did not include nurses who were:

1. A "casual" RN;

2. A "float" RN;

3. A Master's (MSN) prepared RN; and/or

4. Anyone who did not meet the inclusion criteria.

These inclusion and exclusion criteria were used to select participants in this research study. Following initial data collection and analysis from the first few participants, the researcher actively sought participants based on the characteristics of the emerging data. For example, an emerging theme from the data might have been that documentation practice using a combination of the IV PCA Flowsheet and Interdisciplinary Progress Notes was not consistently meeting the standards of practice for documentation. Using the principle of theoretical sampling, the researcher could then choose subsequent subjects who were known to consistently meet their documentation standards to further examine this
theme. This is the principle of theoretical sampling which was used in the method of interpretive description to obtain the most predictable variations of the theme that was being studied (Thorne et al., 1997).

**Recruitment of Potential Participants**

I provided a general introduction of my proposed thesis work at Saint Mary's Hospital. I introduced my research question at the following committee meetings: (a) Patient Care Committee, which included Patient Care Managers and Clinical Resource Nurses (The Vice President of Patient Care and Clinical Services chairs this group); (b) Nursing Practice Council (I was the Chairperson of this group and staff nurses from the various clinical areas attend); and (c) the 5th Floor Surgery Unit Council that was comprised of the Patient Care Manager and surgical staff nurses.

The purpose of those preliminary introductions was twofold: a) to inform committee members that I was a graduate student in the UBC School of Nursing program who wished to conduct my research in their organization; and b) to introduce my research question into nursing practice. My goal was to provide potential participants with the opportunity to think about whether or not they would like to volunteer in this research study at a later date. As previously mentioned, the target population was identified and the accessible portion of the target population was delineated. To reduce the risk of researcher bias, the sampling plan recruited subjects via a process of nomination.

*A letter requesting nomination* was given to the Patient Care Manager (PCM), Surgical Services and the Clinical Resource Nurse (CRN) Critical Care/Surgery. Both the Patient Care Manager and the Clinical Resource Nurse were each asked to nominate five "expert" nurses based on their perception of her/him as an expert nurse in the management of acute postoperative pain in the adult patient population using the modality of IV PCA and the aforementioned criteria that I established as indicative of expert nursing practice inherent in a relevant literature review. Only nurses who had expressed an interest in the
study were actually nominated. I contacted the PCM and CRN within one week of giving them the letter requesting nomination. I asked them for the names and numbers of nominated individuals. I then contacted each individual by telephone to provide a description of the study, answer any questions, and invite participation. Each participant was advised that participation was voluntary and they could refuse to participate or withdraw from the study at any time without jeopardy to their employment.

My role in this hospital was the Clinical Resource Nurse (CRN), Surgery/Medicine. I held the position of CRN Surgery since February 5, 1990 with an expanded title to include Medicine in 1996. I have had many years of experience in managing, monitoring and instructing the practice of IV PCA, as well as developing, implementing and revising an IV PCA program within the context of continuous, quality improvement initiatives. I was the sole person responsible for IV PCA certification of all registered nurses in this organization. This includes RNs working with IV PCA in the Post Anaesthetic Recovery Room (PACU), Special Care Unit (SCU), 5th Floor Surgical Nursing Unit and the Pre-Admission Clinic.

According to Morse and Field (1995), "it is generally agreed that nurses should not conduct qualitative studies in the unit in which they work. First, there is confusion of roles as an employee and as a researcher, and if the information to be obtained is 'research data' or 'patient information to be charted'. This can cause immense dilemmas that may result in misunderstandings, the violation of promises of confidentiality in the researcher role, or the withholding of information as a staff member. Of greatest concern is that data analysis may be impeded because of the researcher's familiarity with the setting. Nurses may not record data on some behavior or another because the behavior may be normative and therefore beyond awareness" (p. 73). I was aware of this research concern; however, I made a conscious decision to collect data in this setting because it was also imperative that the researcher was credible and fit into the setting with minimal disruption (Morse and Field, 1995). I believed I was credible in this
nursing and organizational culture and I was aware of the political, institutional and personal relationships in this group norm. I believed these were strengths not hindrances in this research study. I also believed this was a useful strategy to enter the group, recruit participants and begin the research. Since I was aware of these concerns, I attempted to prevent potential problems. Firstly, I ensured that the nursing staff was aware when I was wearing my research "hat" versus my CRN "hat" to prevent role conflict and confusion. Secondly, I specifically focused my research question on nurses' decision-making in acute postoperative pain management using the modality of IV PCA. There was no correlation between the research question and my CRN role therefore; it refocused me from my usual perspective in clinical practice. Thirdly, to attend to rigor in relation to this potentially difficult situation, I kept a reflexive journal to provide transparency into potential researcher biases and the decisions made by me along with the rationale for making these judgments.

In summary, the sampling plan in this research study was very specific. I explored both diploma and/or baccalaureate prepared RNs' decision-making who were IV PCA certified. IV PCA certification was an outcome of completing the six-step, incremental IV PCA certification process. Nurses had worked with IV PCA therapy in acute postoperative pain practice with more than 100 PCA patients each and for three or more years at Saint Mary's Hospital. The proposed sample size and type did not change throughout the inductive process.

**Data Collection**

Data collection occurred for one month immediately following ethical review approval. Data collection included a modified think-aloud (TA) technique and a post-TA interview. "Think Aloud is a research method designed to elicit information about individuals' reasoning and decision-making by having them verbalize their thoughts (think aloud) during a cognitive task" (Fonteyn & Fisher, 1995, p. 124). Think-aloud has become a popular method used to understand cognitive processes in the
acquisition of knowledge (Fonteyn & Fisher, 1995). According to Fonteyn and Fisher (1995), their published study is the first known describing TA from clinicians while they reasoned in actual clinical practice compared to traditional TA research done using this method in simulated settings only.

As previously discussed, information processing involves the interaction between short-and long-term memory which can be used to explain cognitive processes used in decision-making (Lee & Ryan-Wenger, 1997). According to Fonteyn and Fisher (1995), using TA technique to study nurses' decision-making in clinical practice would improve our understanding of how expert nurses think during patient care. For example, it would provide a better understanding of nurses' sense of collecting salient patient data, the relationships they form between data, and the clinical indicators they use to evaluate patient status along with the outcomes of their care.

Think Aloud Technique

During data collection, the participants carried their own portable, voice-activated, pocket-sized tape recorder (provided by Dr. Barbara Paterson and returned to Dr. Paterson at the completion of the study) with them during the data collection stage. Data collection included both full-time and part-time RNs and included four, eight-hour nursing shifts per participant. The participants were instructed to record their thoughts and decisions about pain management using IV PCA whenever they were not engaged in direct patient care. Think aloud did not occur in front of patients and/or families; therefore, informed consent was not necessary from patients and/or families.

Participants had the opportunity to reflect on their decisions/practices in regard to pain management; this sometimes meant that the nurse recorded immediately after the shift was completed. Each day of data collection included working with IV PCA therapy in clinical nursing practice. For example, if the participant was a full-time employee, she/he may have "thought aloud" for four
consecutive shifts. Conversely, if the participant was a part-time employee, she/he may have "thought aloud" for a total of four shifts but each shift may not have been consecutive.

Nurses were assigned to the data collection period depending upon who was nominated for the study and in accordance with their scheduled hours of work. The goal was to collect data from two participants per week for a total of four weeks (February 14, 2000 - March 10, 2000). The study consisted of an initial, one-hour interview, tape recording their thoughts for four-eight hour shifts, and one two-hour interview following the final tape recording session. A maximum of 35 hours of the participants' time was required for this study.

Data collection focused on the day-to-day decision-making in clinical practice not crisis decision-making regarding acute postoperative pain management using the modality of IV PCA. For example, decisions regarding general categories of pain management, the specifics of IV PCA therapy and details regarding decision-making (see Appendix D).

Procedure of Think Aloud Technique

The following procedure occurred during the data collection phase of this research study:

- Informed consent was obtained from each participant (see Appendix B).

- I, the researcher, interviewed each participant for one hour. During this time, the participants were asked some personal demographic data (see Appendix C), to tell about their experiences managing acute postoperative pain using the modality of IV PCA in day-to-day clinical nursing practice and to respond to questions related to factors, which might influence their decisions.

During the initial interview, each participant was given her own pocket-sized tape recorder, on loan from Dr. Barbara Paterson, UBC School of Nursing. I discussed the process for recording their thoughts in the periods of tape recording in the research study.
• Following the initial interview, each participant was assigned four-eight hour shifts during the data collection period between February 14, 2000 - March 10, 2000. The data collection time period included the time immediately postoperatively when the patient returned to the nursing unit from the PACU and the data collection ended at the time of discontinuing IV PCA. Typically, this timeframe included between 48-72 hours postoperatively. I was not present in clinical practice during data collection.

• At the completion of the participant's four, eight-hour shifts of decision recording data collection period, the participants delivered the tape in sealed, addressed envelopes to me.

• Following the tape recording sessions in clinical practice, I interviewed each participant during a two-hour interview regarding the decisions recorded.

• All interviews were audiotaped and transcribed. The transcriber had access to the audiotapes, but anonymity was protected by only identifying the audiotapes by code number. The participant's name was not be used in the transcriptions of the tapes or interviews. Only a code number assigned to each participant identified each participant's tapes and interviews. Only I had access to the tapes and transcriptions; the tapes and transcriptions were stored in a locked filing cabinet to which only I, the principle investigator had a key. The tapes and transcriptions will be destroyed ten years following the completion of the study. At that time, the tapes will be erased and the transcriptions will be incinerated. The findings in this research study may be published in professional publications, in teaching materials and at professional conferences. The participants’ names will never be associated with the study.

• Each participant will be receiving a written summary of the research findings.
General Categories of Pain Management

To support answering the research question—How do nurses manage acute postoperative pain in the adult patient population using the modality of IV PCA including decision-making around initiating, maintaining and discontinuing pharmacological IV PCA?—participants were asked to tape record their thoughts and decision-making processes. A "Think Aloud Interview Guide" was given to each participant in the study (see Appendix D). The interview guide included general categories of pain management, specifics of IV PCA therapy, and details regarding decision-making. The following are example trigger questions used within the context of the interview guide:

- The nurse's perception of his or her role in acute postoperative pain management in the adult patient population using the modality of IV PCA, including pain assessment and intervention(s);
- The nurse's understanding of what a physician's standing prn order is and what prn orders meant to the nurse generally, and in the context of IV PCA;
- What "patient control" in IV PCA therapy meant to the nurse;
- What "nurse control" in IV PCA therapy meant to the nurse;
- What IV PCA "patient selection" meant to the nurse;
- What was his or her perception of the role of the nurse related to documentation in the PCA Flowsheet; and
- What was the nurse's perception of her/his role related to documentation in the Interdisciplinary Progress Notes using the standard of Focus Charting© to reflect the nurse's role in PCA therapy.

Specifics of IV PCA Therapy

Participants were asked to record their thinking during decisions they made regarding the following specifics of IV PCA therapy:
• PCA initiation;
• PCA monitoring;
• PCA weaning (opioid titration);
• PCA termination (discontinuing IV PCA therapy); and
• Side effect(s) including nursing assessment, intervention(s), and balancing between analgesic need and undesirable side effects.

Details Regarding Decision-making

Participants were asked to provide the following details regarding decision-making:

• Why she/he made the particular decision;
• The nature of the context (e.g., who was there, what was happening);
• The factors that affected the decision (e.g., empty PCA vial, uncontrolled pain, nausea etc.); and
• The choice of the action she took (e.g., increased PCA dose, decreased lockout, called anaethetist).

In summary, the umbrella question and sub-questions in this research study directed data collection using the think aloud technique via voice-activated tape recorders during day-to-day nursing practice.

Data Analysis

Each audiotape was transcribed verbatim by a transcriptionist with specific instructions to transcribe the tapes as accurately as possible to prevent any restructuring of the data and improve validity (Fonteyn and Fisher, 1995). Data analysis in this research study involved data inductively produced from the interviews and think-aloud statements.

Thorne et al. (1997) encourage repeated immersion in the data prior to beginning coding, classifying, or creating linkages and asking questions such as "what is happening here?" and "what am I learning about?" Thorne et al. suggest that asking these questions will stimulate more coherent analytic
frameworks for interpretative description that will prevent premature coding that could "privilege superficial understandings at the expense of deeper and more meaningful analytic interpretations" (p. 174). The research method of interpretative description requires that the researcher know the individual cases intimately, abstract relevant common themes from within these individual cases, and produce a species of knowledge that will itself be applied back to individual cases.

**Procedures for Data Analysis**

The procedures for data analysis were as follows:

1. Reading each transcript in detail, noting how decision-making was described and making notes about the themes and phrases that best described how and why decisions were made;
2. Comparing and contrasting the text of each transcript with that of others, as a whole and in subgroups, noting the similarities and differences between the key themes of decision-making for each transcript;
3. Hypothesizing about the nature of the relationships between the central themes in and across participants; and
4. Translating the findings of sub-groups into one another, refining these translations in a way that was faithful to the interpretations of the original data; that is, so that it accurately portrayed the shared and unique findings of the research participants.

**Rigor**

The purpose of rigor in any research study is to prevent error and specifically, in qualitative research to promote trustworthiness (Morse and Field, 1995). According to Lincoln and Guba (1985), "the basic issue in relation to trustworthiness is simple: How can an inquirer persuade his or her audiences (including self) that the findings of an inquiry are worth paying attention to, worth taking account of?" (p. 290). Since the method of interpretive description lends itself to a continuously evolving process (Thorne
et al., 1997), attention to rigor is of paramount importance. To address the issue of trustworthiness, Lincoln and Guba suggest four general criteria (a) truth-value, (b) applicability, (c) consistency and (d) neutrality. These criteria provided a framework for attending to rigor in this study.

**Truth-Value or Credibility**

Lincoln and Guba (1985) correlate credibility to internal validity in conventional research. Sandelowski (1986) proposed that credibility "resides in the discovery of human phenomena or experiences as they are lived or perceived by subjects" (p. 30). Morse and Field (1995) maintain that truth-value is subject oriented and not pre-defined by the researcher. In essence, to be credible, or have truth-value, qualitative research presents a description of the experiences those persons having that experience would recognize as their own.

Lincoln and Guba (1985) suggest five techniques to promote credible findings and accurate interpretations. Briefly, they are (a) activities increasing the probability that credible findings will be produced (i.e., prolonged engagement, persistent observation, and triangulation), (b) peer debriefing, (c) negative case analysis, (d) referential adequacy, and (e) member checks.

Of particular significance in this study, was (a) above. For the purposes of this study, I specifically addressed prolonged engagement and persistent observation. Prolonged engagement is "the investment of sufficient time to achieve certain purposes: learning the 'culture', testing for misinformation introduced by distortions either of the self or the respondents, and building trust" (Lincoln and Guba, 1985, p. 301). I was involved in the culture of the 5th Floor Surgical Nursing Unit for ten years and specifically involved in PCA since its inception on this nursing unit in 1994. I was oriented to the culture and understood this culture thoroughly and completely. I also believed that I had built trust over the years and that my prolonged engagement in this nursing culture sufficed adequate trust and rapport to promptly emerge into this research study.
Conversely, I was also aware of the potential for what Lincoln and Guba (1985) term going native. "The field worker may over identify with the informant and start to lose his research perspective...prolonged direct participation entails the risk that the researcher will lose his detached wonder and fail to discover certain phenomena that the relatively uninvolved researcher would discover" (pp. 303-304). As previously discussed (recruitment of potential participants section of this proposal), I was aware of this potential. However, I made a conscious decision to proceed with this research in this culture because I strongly believed that in order to get at the depth or crux of understanding this research, the investigator must first and foremost, be credible in practice and be trustworthy. My argument was that awareness of the potential problem would be the first step toward preventing "going native." My argument proved correct in that I successfully managed to maintain my neutrality and sense of 'detached wonder' throughout the research process.

Persistent observation "adds to the dimension of salience to what might otherwise appear to be little more than a mindless immersion" (Lincoln and Guba, 1985, p. 304). A danger in this category is that of premature closure. I was very conscious of this criterion since time, or lack thereof, was a potential limitation in this research study. To meet the requirements of the graduate program, this thesis had to be completed by a specified date, which meant that data collection could only occur between a limited period. Potentially, premature closure was a limitation in this study. Premature closure was ultimately not a limitation in this study because sufficient data were collected within the established time frame.

Applicability

This criterion was used to determine whether the findings in this study could or could not be applied or transferred to other contexts or settings or with other groups or subjects beyond this study. The principle of theoretical sampling and the use of inclusion criteria in this study attended to this criterion.
Therefore, in qualitative research it is the researcher's responsibility to provide the data base that makes transferability judgements possible on the part of potential appliers (Lincoln and Guba, 1985).

**Consistency**

According to Lincoln and Guba (1985), in conventional studies, reliability is typically demonstrated by replication; i.e., "if two or more repetitions of essentially similar inquiry processes under essentially similar conditions yield essentially similar findings, the reliability of the inquiry is indisputably established" (pp. 298-299). In qualitative studies, i.e., interpretive description, the emphasis is on the uniqueness of the human experience so that variation in experience rather than identical repetition is to be expected (Morse and Field, 1995).

**Neutrality or Confirmability**

Conventionally, the concept of objectivity is used with the onus on the researcher to be objective. In qualitative research, the emphasis is removed from the researcher and placed, more appropriately on the data themselves. The issue is no longer the characteristics of the researcher; rather, the issue becomes the characteristics of the data; i.e., are they or are they not confirmable? Confirmability is achieved when credibility, applicability, consistency and neutrality are achieved (Lincoln and Guba, 1985).

**Reflexive Journal**

In addition to the above framework that attended to rigor in this study, Lincoln and Guba (1985) recommend the use of a reflexive journal. This journal is a diary that is used on a daily basis by the researcher to record a variety of information about self (hence the term "reflexive") and method. In relation to self, the reflexive journal provided insight into researcher biases, which influenced the outcomes. With respect to method, the reflexive journal provided insight into decisions made by the researcher and rationale for making those judgements. Data analysis in this research study included the data in my reflexive journal.
Ethical Considerations

Several procedures protected the rights of human subjects (nurses) prior to initiating this study. Approval for this research study was requested and granted from the In-Hospital Executive Committee and Board Ethics Committee as well as the University of British Columbia Behavioral Research Ethics Board. The consent process included a letter requesting nomination (Appendix A) and an informed consent form (Appendix B) prior to conducting this research study. In addition, each participant received a verbal explanation of the purpose of this study and research design as well as an opportunity to discuss any concerns regarding the study.

Careful handling and monitoring of the audiotapes maintained confidentiality. For example, anonymity was maintained by referring to each participant by a code number. I am the only person who knows the code numbers and identities of each of the participants. Participants were instructed not to use patient, family or co-workers' names on the audiotapes. Careful reporting of all data in this thesis report, in publications, and in verbal or written presentations will ensure participant confidentiality. As a final consideration of ethical consideration, I collaborated with each participant in relation to my interpretation of data analysis.

Findings related to the Research Process

Following my initial one-hour interviews with each of the participants' and in reviewing my reflexive journal, I intuitively sensed that all of the study participants were keen about participating in this research study. My original assumption had been that the nurses might experience initial discomfort with the research study because of the tape recorders and tape recorded sessions being potentially intimidating in clinical practice. My assumption proved wrong. Although some of the participants found the tape recorders awkward, using the tape recorders was not a barrier in the research study. This prompted me to
wonder what the actual research experience and process was like for each of the nurses and whether or not this was a contributing factor relating to their decision-making in IV PCA.

According to Appleton (1998), “clinical nursing research serves as the foundation for decision-making and ultimately shapes the way in which nurses design their practice” (p. 43). Therefore, I decided to ask each of the nurses at the end of the two-hour interviews what it was like for them to be nominated for this research study and whether or not they would participate in another research study. My rationale for including these two interview questions was to provide me with the opportunity to refine the interpretive description of the decisions expert nurses make and the factors influencing those decisions in the context of IV PCA. Also I wanted to determine if, in fact, the actual research process contributed to the nurses’ lived experience.

With respect to being nominated for the research study, several unique perceptions were discovered which validated my intuition about the participants being keen to participate in the research study. Keen to participate to the participants meant feeling honored, complimented, excited, and genuinely pleased about being involved in a new experience with the opportunity to learn from it. Nomination validated their nursing practice. There was a sense of recognition and mutual respect between the nominees and the nominators.

Interestingly, this was the first nursing research study that each of the seven participants had participated in. The Patient Care Manager, 5th Floor Surgery, was influential and demonstrated commitment to all participants including myself by supporting my research proposal and allowing me to conduct this research in her clinical area. Furthermore, the participant’s time was valued in that participants, for the most part, participated on paid work time. Some participants chose to complete their think-aloud sessions on personal time and three participants volunteered to participate in the follow-up
interview on their own time. The Patient Care Manager provided financial reimbursement for the nurses who chose to participate on their own time.

A persistent theme that emerged from all of the participants was their personal acknowledgement of increased self-awareness in relation to their personal and professional growth. This was perceived to be a positive factor, which would ultimately contribute to changes in their practice and could inevitably contribute to improved patient care outcomes in acute postoperative pain management. As Appleton (1998) eloquently claims, "by supporting each nurse’s creativity, nursing occurs in partnership. Nursing research relates to the true function of the work of nursing – more specifically, the art of nursing" (p. 45).

**Summary**

In Chapter Three, the research design of interpretive description was presented as an approach to answer the research question—How do expert nurses manage acute postoperative pain using the modality of IV PCA including decision making around initiating, maintaining, and discontinuing pharmacological IV PCA therapy? This research design was appropriate since little was known about the decisions expert nurses make and the factors influencing those decisions regarding patients' experiences of acute postoperative pain and its management using the modality of IV PCA. In addition, I wanted to contribute to the development of nursing practice knowledge.

Chapter Three also discussed the rationale for selecting the method of interpretive description, the process of theoretical sampling, sample inclusion and exclusion criteria of "expert" PCA nurses and the process for requesting nominations of participants. Methods of data collection, including "think aloud" technique and data analysis including validation of emerging data with the participants were described. A discussion of rigor as it applied to this study specifically addressed trustworthiness in relation to the method of interpretive description. Ethical considerations were outlined and have been adhered to in order protect and preserve the rights of human subjects during this research study and in any future
publications and/or presentations that may occur as an outcome of the findings in this study. Finally, a review of the impact of the research process, on the participants and myself, was briefly described. The findings of the study are presented in Chapter Four.
CHAPTER FOUR: FINDINGS

In this chapter, I present an analysis of data collected from participants who shared their IV PCA clinical experiences and decision making. In addition, data analysis included my reflexive journal process that I committed to and engaged in during data collection and analysis. The research findings occurred in response to the research question—How do expert nurses manage acute postoperative pain using the modality of IV PCA including decision making around initiating, maintaining, and discontinuing pharmacological IV PCA therapy? In other words, what does expert nursing care mean in the context of IV PCA therapy and decision making? Descriptions of participants' nursing care decisions and the factors influencing these decisions during IV PCA practice are described to obtain clarity of the processes nurses use to make decisions about IV PCA. Emergent themes related to decision making are also presented as part of the research findings.

Two hundred and eight hours of “think-aloud” transcriptions were analyzed and coded according to categories that emerged throughout data collection. Categories that emerged were: perceptions of participants as “expert” and/or having "expertise" in IV PCA practice; participants’ decisions and clinical judgments, including the assessment to support and evaluate a decision; the relationship of knowledge to practice; and contextual factors influencing participants’ decisions.

A total of seven participants were nominated for this research study out of a population of 28 nurses (15 full-time and 13 part-time). Six participants completely fulfilled the study requirement of four 8-hour think-aloud sessions in clinical practice. A seventh participant completed only two of the expected four sessions due to unavoidable absence from the nursing unit; these data were included. The participants were selected and nominated by clinical peers for their perceived “expert” level of practice based on specified inclusion criteria. All participants completed a demographic questionnaire at the onset of the study. The participating agency, Saint Mary’s Hospital, has requested to be identified in all
publications regarding this research study. The sample included one male participant; however, for the purpose of confidentiality, all references to participant gender will be feminine.

Sample

The study sample will be described in terms of demographics, including participants' experience, and perception of expertise. The setting for this interpretive description study was a 100-bed acute care hospital affiliated within the Simon Fraser Health Region in the Lower Mainland, British Columbia. The sample was obtained from a 31 bed combined surgical inpatient unit in Saint Mary's Hospital. Fourteen (14) beds on the unit are dedicated primarily to eyes, ears, nose and throat (EENT) surgery; the other 17 beds are comprised of orthopedic and general surgery including breast, gynecology, urology, and other general surgeries. Additionally, there is a 2-bed Special Care Unit (SCU) adjacent to the surgical unit, staffed by critical care nurses for acutely ill patients.

Demographics

Table 1 provides a demographic profile of the participants (n = 7) regarding gender, age, educational background, and continuing pain management education. Table 2 represents an experiential profile of the study sample.
Table 1. Demographic profile of participants (n = 7)

<table>
<thead>
<tr>
<th>Category</th>
<th>Variables</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female (6)</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td>Male (1)</td>
<td>14%</td>
</tr>
<tr>
<td>Age</td>
<td>17-29 (1)</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>30-39 (2)</td>
<td>29%</td>
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<tr>
<td></td>
<td>40-49 (1)</td>
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</tr>
<tr>
<td></td>
<td>50-65 (3)</td>
<td>43%</td>
</tr>
<tr>
<td>Education</td>
<td>Diploma (1)</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>Baccalaureate (7)</td>
<td>86%</td>
</tr>
<tr>
<td>Completion of continuing education on pain management in preceding five (5) years</td>
<td>Yes (4)</td>
<td>57%</td>
</tr>
<tr>
<td></td>
<td>No (3)</td>
<td>43%</td>
</tr>
</tbody>
</table>

Table 2. Experiential profile (n = 7)

<table>
<thead>
<tr>
<th>Category</th>
<th>Variables</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total years of nursing experience</td>
<td>1-6 years (1)</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>7-12 years (1)</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>13-22 years (2)</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>23-32 years (3)</td>
<td>43%</td>
</tr>
<tr>
<td>Total years of surgical experience on nursing unit</td>
<td>1-6 years (2)</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>&gt;6-12 years (4)</td>
<td>57%</td>
</tr>
<tr>
<td></td>
<td>&gt;12 years (1)</td>
<td>14%</td>
</tr>
<tr>
<td>Total years practicing IV PCA certification</td>
<td>4 (1)</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>5 (1)</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>6 (0)</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>7 (4)</td>
<td>57%</td>
</tr>
<tr>
<td></td>
<td>8 (1)</td>
<td>14%</td>
</tr>
<tr>
<td>Total IV PCA patients cared for post IV PCA certification</td>
<td>100-399 patients (2)</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>&gt;400 patients (5)</td>
<td>71%</td>
</tr>
</tbody>
</table>

**Perception of Expertise**

Nursing administrators nominated participants who they considered to be expert nurses. The demographic findings indicate that this sample was comprised of experienced nurses in all four of the
experiential categories of IV PCA management (see Table 2). For example, almost three-quarters (72%) of the participants had practiced as a Registered Nurse between 13 and 32 years. Almost three-quarters (71%) of the participants had been surgical nurses on this surgical nursing unit between seven or more years. Seventy-one percent of the participants had practiced IV PCA post-PCA certification between seven and eight years. This finding is particularly noteworthy because IV PCA had only been available in this agency for eight years. This means that a substantial proportion of these participants have been involved in IV PCA practice since its inception at Saint Mary's Hospital. In addition, 71% of the participants had cared for more than 400 IV PCA patients each as RNs certified in IV PCA practice. The total number of patients cared for following IV PCA certification was a guesstimate by each participant.

Expert versus Expertise

The participants did not share a definition of expert or a common understanding of the association between being an expert and expertise. For example, 29% of the sample believed themselves to be expert nurses with expertise specifically in IV PCA management. The remaining 71% perceived themselves as having IV PCA expertise but not enough nursing experience to consider themselves expert nurses. This highlights the ambiguity that is inherent in the term expert. Therefore, the concept of expert decision making in IV PCA management in this study must be interpreted through the lens of the participants (i.e., although they were nominated as experts, they believed they had expertise in IV PCA management but did not necessarily consider themselves to be general nursing experts). The strategies used to solely recruit expert nurses into this research study resulted in a sample in which the perception and experience of being an expert were varied.
Nurses' Decision Making

The General Process

During the analysis of the think-aloud sessions in clinical IV PCA nursing practice, a more comprehensive description of the decision-making component of the analytic framework presented in chapter two (see Figure 2) emerged. Analysis resulted in a tri-fold categorization of decisions. Two types of clinical decisions emerged directly related to IV PCA, with a third type specifically related to an ethical dilemma. The three types of decisions are (a) immediately intervene, (b) wait and watch with potential intervention at a later time, and (c) to do nothing. Once I determined that the participants employed three types of decisions in daily IV PCA practice, I needed to determine the factors that influenced those decisions. To assist me in illuminating those factors, I developed my own decision-making framework that I applied to each of the three decisions to "flush out" factors influencing those decisions. The framework consisted of three parts: (a) assessment to support and evaluate the decision, (b) the relationship of knowledge to practice, and (c) contextual factors influencing the decision. Each of the three key elements of the decision-making framework is applied and discussed within the context of each decision in an effort to capture the richness and complexity of the nurses’ decision making in day-to-day clinical IV PCA practice.

The Decisions

Decision to Immediately Intervene

Decisions to immediately intervene fall into two categories (a) basic nursing measures and (b) IV PCA-related interventions. Basic nursing measures used in isolation or combination include interventions such as positioning, assisting with ambulating, assisting to the bathroom, grooming and hygiene, application of the continuous passive motion (CPM) machine, modifying dressings, providing a warm blanket, and applying ice packs. IV PCA-related interventions involve anything related to medication
management (opioid dose-sparing analgesics such as nonopioids), side effect management (nausea, vomiting, oversedation, respiratory depression, pruritus, urinary retention, constipation), pump management (modalities and settings), and documentation. A critical component of both basic nursing measures and IV PCA-related interventions is patient teaching. A significant finding is that the decision to immediately intervene never included accessing the physician's standing prn orders to manage situations of acute postoperative uncontrolled pain. Uncontrolled pain is defined as a patient's perceived pain intensity level (self-report) of greater than three on a zero-to-ten pain scale. This finding will be further examined in the context of the wait and watch decision.

Participants were clear about the significance of basic nursing measures in decisions related to immediate intervention.

One thing I find, too, like last night with the lady, nursing measures – plain nursing measures, I repositioned her, put her back in the CPM. I find some people once they get on PCA that’s all they’re focused on are the medications. But you have to look at other factors too. Like she said her dressing was too tight, so I loosened that off a little bit and that seemed to help her pain as much, if not more than pushing the button.

Repositioning...Especially with orthopedic patients. The total hips they can only stand to be on their side for so long, so changing them does help their pain. Some can stand to be on their backs, some like to be on their side. With the knees, if they’re in the CPM, they’re sore. If they’re out, they’re stiff, so you sort of have to create a balance between the two.... There’s a variety of nursing interventions. Just like the positioning and giving them a warm blanket, moving the pillow, loosening a tight dressing, just basic nursing.

I think nursing measures make a tremendous difference on patients’ pain. I think if you can get somebody comfy, get their hair brushed out of their face, get the sweat off of them, make their mouths feel fresh, get clothes arranged comfortably, get the wrinkles out, I think it makes a tremendous difference on how they feel their pain. I really do.

Assessment to support and evaluate decision.

The IV PCA pump technology includes three possible IV PCA modalities: 1) PCA only mode; 2) continuous only mode; and 3) PCA mode plus a continuous infusion. The following narrative is one example that illustrates a decision to immediately intervene in relation to the IV PCA modality. At the
time of the participant’s initial assessment, the patient was receiving the modality of IV PCA plus a continuous infusion. The decision to immediately intervene meant that the participant immediately discontinued the continuous infusion so that the patient was left with the modality of IV PCA only. "Day staff had decided to start the patient on a continuous PCA [PCA plus continuous infusion] because he was having pain… My immediate decision was to stop the PCA [continuous infusion] and that’s what I did…" The participant’s assessment to support and evaluate this decision was as follows:

The patient was sound asleep when I walked into his room. Had a quick glance. His respirations were 16. They were regular. They were deep. I started my assessment at the toes, hoping that would wake him up, which it did. You know we had a brief conversation. I checked his circulatory status, his movement, his sensation, his warmth, all were good except his toes were cold, but his other foot was cold as well. There was no bleeding. The hemovac was good. He was using the continuous passive motion machine (CPM). I said, ‘Are you having any pain?’ He said, ‘No, no, no pain. Feel great. No problem. Isn’t that wonderful? Isn’t that wonderful? And as soon I was finished speaking directly to him he went right back to sleep again. The anesthetist was there at the same time checking with the patient. Same thing, he would drift off to sleep in the middle of a conversation. So, to me that’s a sedation level of 3. That’s a pain level of zero. And upon further investigation, the anesthetist indicated the gentleman had been given a good healthy dose of epimorph and was thinking that he probably wouldn’t need the continuous. The anesthetist had given him 0.35 mg of epimorph which in a 70+ gentleman, and he didn’t look robust. He was sort of a frailish looking fellow. That’s a good dose. I’ve often had patients back on the floor who have not required to use PCA at all and that’s you know, when they push the button themselves, when they’ve had 0.25 mg of epimorph… You know I recorded what amounts he was at. He had had 2.5 mg in total. I stopped it. He was on epichcks so I needed to check him hourly anyway, if not more often and that was my choice at the time given what he’d presented. I went back to the desk and wrote that down in the chart. My PCA monitoring, my actions and just wrote down that I would continue to monitor him.

This narrative reveals that the participant engaged in a comprehensive postoperative patient assessment including a subjective and objective assessment of the patient’s acute postoperative pain. Specific assessment parameters used by the participant in the IV PCA program to facilitate decision making were a combination of respiratory rate (depth and quality), sedation scale, and pain scale. In essence, the respiratory rate was normal, the patient had no pain and the patient was drowsy while receiving a continuous morphine infusion plus IV PCA. In this situation, the participant collaborated with
the patient and the anesthetist (who was present on the nursing unit) and ultimately executed a decision based on input from three sources and the assessment of that between the patient, anesthetist and the participant. The participant made this decision immediately prior to discontinuing the continuous IV PCA infusion. The pain management outcomes of this decision were that the patient had the IV PCA mode only for pain control (as opposed to IV PCA plus continuous), achieved good acute postoperative pain control and did not encounter oversedation and/or respiratory depression. Therefore, the nurse successfully achieved a balance between pain and potential opioid side effects.

The relationship of knowledge to practice

The principal goal of pain management in the IV PCA program is to titrate a balance of acceptable pain (since complete pain relief may not be a realistic outcome in acute postoperative pain) and tolerable opioid adverse effects. For example, the most common IV PCA opioid side effects include nausea, vomiting, oversedation, respiratory depression, urinary retention and constipation. In the preceding scenario, the participant knew that a potential opioid side effect in the IV PCA program is respiratory depression and that the nursing care required to reverse this side effect would be a nurse/patient ratio of 1:1. This participant has also encountered past clinical experiences with patients who have experienced the side effect of a respiratory depression while receiving a continuous IV opioid infusion. Since the patient in this scenario was drowsy and did not have any pain, the participant decided to immediately intervene by discontinuing the continuous infusion in an effort to prevent the potential side effect of respiratory depression. This intervention demonstrates how the participant titrated a balance between pain (the patient had no pain) and tolerable opioid side effects (the patient was drowsy which could have led to oversedation/respiratory depression). In addition to discontinuing the continuous IV opioid infusion, the participant committed to manage the patient’s pain by monitoring the patient every hour, providing/reinforcing patient teaching, and encouraging the patient to push the IV PCA button as required.
The participant immediately decided not to risk the potential side effect of respiratory depression when the patient was not experiencing pain. This example also conveys the importance of frequent patient monitoring while receiving IV PCA to prevent untoward opioid side effects. Although research findings using large population studies indicate that the potential side effect of respiratory depression may occur infrequently while receiving IV PCA opioids, it does not negate the responsibility and accountability for the participant’s diligent assessment and monitoring of this patient population. In fact, this is a prime example of how the participant recognizes this responsibility and commits to this intervention in an effort to prevent this potential opioid complication.

**Contextual factors influencing decision.**

Contextual factors relate to the things around a person, such as the personal factor of knowledge level. Contextual factors are often significant in the decision-making process. The following narrative reveals three contextual factors influencing the decision to immediately intervene.

I've always had trouble with continuous PCA. Always had patients who at some point in the shift got so low their respiratory status that we’ve marched those people into the [special care] unit. Because they were so low we just couldn’t stay with them on 1:1 for the hour it took to get them back up again. In seeing how he presented and looking at his behaviors and looking at his sedation scale, I just thought there’s no way this man needs continuous. I can come in every hour and remind him to hit the button if that’s what it takes and I would rather have done that than come back in half an hour or 45 minutes or an hour and find the guy was barely breathing. I just didn’t want to go there.

Time was a factor in this scenario because the participant anticipated that it would take about an hour to reverse the effects of a respiratory depression. The participant may or may not have had time to stay with the patient one-on-one depending upon the status of her workload. Resources were another factor since the Special Care Unit (SCU) nurse may or may not have been available to stay with the patient one-on-one. Thirdly, transferring the patient to the SCU was also a factor because there may or may not have been a bed available in the SCU for close monitoring and intervention. All of these factors
influenced the participant to immediately intervene with a goal to prevent the potential side effect of respiratory depression.

[The Special Care Unit (SCU)] is a resource that we have for a patient who gets into trouble, who needs 1:1 that we’re unable to provide because of either what’s going on the floor or just your own workload. It’s not typical to put a PCA patient in there whose respirations have dropped down. It would be more typical to call the SCU staff to come and sit with the person until they became more responsive and their respiratory rate got better. But, if it’s going to take longer than an hour you put them in the Unit. That means a nurse who’s got the time because she doesn’t have a patient load – I mean that’s if there’s no patient in the Unit, of course [The SCU is a two-bed unit which means that the nurse-patient ratio is 1:2. The SCU nurse is a critical care nurse. If there are no patients in the Unit, the SCU nurse can either be a resource on the nursing unit or the patient can be transferred into the Unit for closer monitoring and intervention by the SCU nurse]. And somebody whose clinical assessments are very possibly a bit better than my own, their area of expertise... I don’t have any problem asking for help and it’s always come when I needed it.

By examining the decision to immediately intervene factors emerged that were simultaneously affecting this decision. These factors are related to the participant (assessment, knowledge [knowing the patient, intuition, expertise in IV PCA]), the patient (patient behavior [ability to self-assess, self-report and 'hit' the button]) and the context of the situation (time, resources and environment). The pain management outcome of the decision to immediately intervene was optimal. An optimal pain management outcome is defined as a patient’s pain being controlled/balanced without untoward side effects. In this situation, pain was controlled and the patient did not experience the potential side effect of respiratory depression. The patient is the sole person responsible for pushing the IV PCA button, which is the standard of practice in this organization.

The contextual factors influencing this decision are time, pooling resources and the environment. The following example illustrates a participant’s decision to immediately intervene and links it to intuitive decision making.

I felt I had all the data I needed to make that decision right then and there. Everything that was presented to me was very clear. It wasn’t anything I had to think twice about. It was real clear, so do something now... I knew it was a situation that had to be acted on now because waiting and
watching would have only increased the amount of medication he got and possibly his respiratory rate may have decreased.

In the participant’s narrative, the participant uses the words “felt” and “knew.” The decision to immediately intervene is based on knowledge, skill, experience, critical thinking, and strong technical expertise as evidenced by the participants in this study with years of general nursing experience and specialized expertise in IV PCA practice. The participants stated that if nurses are aware of and understand the IV PCA standards, they have the knowledge, skill and ability to immediately intervene.

A strong theme that emerged was the participants’ knowledge of and ability to access resources within the agency when they were required to facilitate immediate intervention of the decision. Numerous resources were consistently accessed in such decisions. They included all members of the interdisciplinary team. For example, the physicians' preprogrammed orders (both anesthetists’ IV PCA and surgeons’ postoperative), the patient’s old chart, the patient’s family, interpreters, other nurses certified in IV PCA, PACU nurses, anesthetists, float nurses, orderlies, surgeons, surgeons-on call, Pace Physician [in-house physician between 1930 hours and 0730 hours], administration [Patient Care Manager], surgical consultants such as the urologist, and, rarely the Clinical Resource Nurse (CRN). Interestingly, the participants in this sample identified the CRN as an available resource; however, this resource was not generally accessed during their think-aloud sessions.

The following narratives demonstrate how, when, where and why the participants accessed and utilized resources during the decision to immediately intervene. Peer expertise and pooling resources were common strategies in the decision to immediately intervene.

My behavior with regard to this was to seek out at least two other colleagues to discuss pain management and validate that an additional number of hours may be required to arrive at a definitive conclusion one way or another about efficacy of PCA for this patient.

It’s a decision – you’ve got a group of people there with you and they each bring different things to practice. And people are better at other things than others are. Some people are great on the
phone with doctors, wonderful. Really good at getting stuff done, put them at the desk. They’re
good at it. They like it let them do it. But others are better on the floor one-to-one with the
patients doing things. So I think if you don’t recognize those strengths and weaknesses in that
group you’re working with today, you’re not cashing in on what you do best and what others do
best...I think it’s about pooling resources. And I guess expertise too. I don’t know which. I think
you’re looking at the group as a whole and you’re looking at the resources and the expertise
available to you and how you can invest that time.

In summary, the factors affecting the decision to immediately intervene (see Table 3) are expertise
in IV PCA practice, knowing the patient, and intuition. Contextual factors influencing the decision to
immediately intervene include time, resources and the environment. In terms of decisions to immediately
intervene in IV PCA practice, the nurse must be concerned about pain management outcomes and what
immediate intervention will mean with respect to managing pain while simultaneously preventing
untoward opioid side effects.

Decision to Wait and Watch with Potential Intervention at a Later Time

All participants used the wait and watch decision type throughout the think-aloud sessions in
clinical practice. Initial analysis of the wait and watch decision suggested that the decision occurred solely
in the context of nursing knowledge of IV PCA practice. However, the participants stated that these
decisions are directly related to nursing knowledge of pain management as well as being an integral part of
nursing knowledge of IV PCA practice. Analysis of the think-aloud sessions, utilization of the principle
of theoretical sampling, and application of the decision-making framework that I used during analysis
were helpful methods to extrapolate the factors influencing and affecting the wait and watch decision type
in IV PCA practice.

Assessment to support and evaluate decision

The participants’ knowledge and attitudes influenced and affected the decision to wait and watch
with the potential to intervene at a later time. For example, a prevalent belief (100% of the participants)
that surfaced in the wait and watch decision was that it was not realistic to have "zero" pain postoperatively on the 0 to 10-pain scale.

That is their prerogative, to have no pain. I guess they have the right to have no pain. I have a little bit of difficulty with that because I don’t think they can have an invasive procedure done like surgery like a lot of the ones we do and have no pain. They should be comfortable, but I don’t think having no pain is a reality.

I think it’s very hard to have surgery and not expect to not have any pain at all. I think that most of us think there will be at least some discomfort. But I think you still try to keep them as comfortable as you can. If it turns out for some reason that they cannot tolerate any pain at all, you need to do whatever you can to get them comfortable and get them as close to 0 as you can…. I think it’s unrealistic to have no pain, but still you know we try to get them there.

The participants’ belief that zero pain is an unrealistic goal is a major influencing factor in the wait and watch decision. In practice, this can be illustrated as follows. A patient reports a pain intensity of three. The nurse adopts a wait and watch decision because she has the belief that intensity between one to three is realistic pain control. If the pain intensity increases, the nurse may consider intervention. However, a pain rating greater than 3 ought to "flag" the need to revise the pain treatment plan with higher doses of analgesics or different medications and other interventions. Even temporary pain at a level of 6 or more should mandate immediate intervention (McCaffery and Pasero, 1999). The participants in this study typically used immediate basic nursing interventions in the wait and watch decision but they did not immediately access the physicians' prn orders to alter/increase the opioid doses; they waited and watched. In wait and watch decision making, nursing assessment was guided primarily by beliefs and biases that the participants may or may not have been aware of at the time of the study.

I just think that some patients are—oh, wimpy. If that’s how you want to say it. I just think that’s unrealistic [to get a patient to zero on the 0 – 10 pain scale]. I think it’s totally unrealistic in the first day or two… You have to be realistic and expect pain. You have surgery, it goes away and will go away again and it will get better.

My initial thoughts about the patient were that she might be a wimp. There is just no other way to say it. That’s what I thought in my mind. My reasons were that her voice was quite whiny when she was speaking to me. It was a little girl voice she was using…..My initial thoughts were she doesn’t have a lot of experience with pain… I just wasn’t 100% sure what was going on with her.
The wait and watch decision was always used prior to changing the IV PCA pump parameters for situations of uncontrolled pain per the IV PCA physicians' standing prn orders. For example, the IV PCA physician's standing prn orders specify that nurses can manage (titrate) instances of uncontrolled pain by incrementally (a) increasing the IV PCA dose the first hour, (b) decreasing the lockout the second hour, and (c) calling the anesthetist by the third hour. Interestingly, participants did not decide to immediately implement the IV PCA physician's standing prn orders to manage patients' pain when patients experienced pain intensity levels greater than 3 on a 0 - 10 pain scale. Rather the wait and watch decision was used to observe how patients self-administered opioids using the IV PCA technology; i.e., nurses assessed the patients' understanding of the IV PCA technology and their ability to "hit" the IV PCA button for pain control.

If a patient experienced uncontrolled pain, typically the participants' would utilize an assessment phase of a patient's uncontrolled pain on the one hand and on the other hand, they immediately intervened by utilizing basic nursing measures, reinforcing IV PCA teaching, encouraging them to 'hit' the button, and/or managing side effects pharmacologically. If all of these measures were unsuccessful and uncontrolled pain persisted then, and only then, did the participants intervene by accessing the sequential physicians' standing prn orders to manage pain. In addition, when the participants did decide to implement the IV PCA physicians' incremental standing prn orders for uncontrolled postoperative pain, the participants increased the IV PCA dose, they may or may not have decreased the lockout, and they did not typically call the anesthetist. This means that IV PCA decision making typically occurred between the nurse and the patient. In other words, a triad of decision making between the patient, nurse and anesthetist and in accordance with the physicians' standing prn orders was the exception for situations of uncontrolled pain in this patient population, rather than the norm.
Essentially, the participants waited and watched to determine if the patients were able to push the IV PCA button on their own accord and/or understood how to use the IV PCA technology before increasing the amount of opioid medication the patient received. In other words, participants made clinical judgments in relation to whether or not patients were "in control" of their pain. Inherent in this decision was the participants' postoperative observations and assessments of patients' abilities to work with the IV PCA technology following their pre-operative teaching which had been done in the pre-admission clinic approximately two weeks prior to hospitalization.

She wasn’t pushing the button. So what I wanted to try was just to see if she pushed the button a little bit more if that would help and then if that didn’t help any I would consider other methods. I try that first and then if that didn’t work I’d try something else. If that didn’t work I’d look into increasing the dose, decreasing the lockout, calling the anesthetist. That’s just kind of the first thing I thought of.

It’s a judgement call. I guess if I’m going to increase the pump, I like to be right there at that hour one when they say it’s not working. I like to see them use it a number of times within that hour and say it’s still not working and then I’ll put it up. Whereas, just an 8-10, you haven’t pushed that button for the last, you know, 10 minutes. Push the button. If you’ve got pain, push the button…I’ll reinforce the teaching a number of times. Push it now and then some people actually want the visual. Well, how do I know when? I say, well, you know, it’s not a matter of having you know when. It’s “Are you having pain again?” And then sometimes you get into this position – you know – 15 demands in one hour of PCA. So then I’ll actually show them. See this lockout, when the stars [the stars on the pump provide a visual to indicate that the patient is not in lockout] on the pump [appear] you can give yourself something more for pain.

I just know that I have to see them and talk to them for a little while before making a decision and I try not to be influenced with what somebody else wrote and with what somebody else is telling me. I try and do it myself. And even to this, to changing my opinion. I try to keep open. And I knew that about her. I knew I needed further assessment. I knew that this initial – there had to be more to it than this. There had to be more than just this wimp in this bed.

The Relationship of Knowledge to Practice.

The wait and watch decision revealed that the participants had the knowledge related to implementing the physicians' standing prn orders for uncontrolled pain; however, participants did not immediately utilize these orders even though they had the knowledge about them. The wait and watch
decision introduced a discrepancy between a patient’s self-report and pain behaviors and the inability of participants to understand that pain can and does exist despite incongruence between verbal and non-verbal behaviour; i.e., participants’ beliefs regarding postoperative pain intensity, the patient’s self-report of pain and their lack of knowledge in relation to this.

I assess them both [self-report and behaviors] because sometimes the patient will say they are not having any pain and the look on their face is total agony when you get them moving. So I sort of take that into consideration and then clarify with the patient...because sometimes I don’t believe them because like the non-verbal cues and stuff.

See my own opinion colors my perception. What they say. I think if they look comfortable to me but they tell me their pain is 8/10 I have a problem with that. Or if they fall asleep when you stop talking to them, but then when they wake up they say their pain is 8/10, I have a problem reconciling those two.... Well, if it’s 8 and they want it to be at zero, I will try and get them more comfortable but I don’t think zero is realistic.

I guess maybe it’s old-fashioned. I don’t know. But we still do use things like blood pressure and vitals as an indication of pain. Often the patient is saying, oh no, I’m fine. But the blood pressure is sky high. Because I still believe that patients bring a lot of cultural biases with them, as well, about the pain. There are whole cultures that believe in being stoic and they’re not going to tell you if they’re going to have pain. They’re in agony and so I think sometimes you have to use other cues. Just like the person who says their pain is a 10 but your eyes are telling you something else. I believe they believe their pain is a 10, but that doesn’t necessarily mean that I have to give them morphine. I think it may mean other things, like anxiety and fear and maybe some of them just hate hospitals. And that’s going to make their pain 10. So, I believe they believe that it’s a 10, but I believe that that may not always be – mean you give them more analgesic. I think there’s other things you can do.

Another issue around the relationship between knowledge and practice as it related to the wait and watch decision was the unanimous belief of the participants that it was unrealistic to achieve "zero" on a 0-10 pain scale. This belief prevented participants from striving to achieve a zero pain goal and settling for much higher self-reported levels by their patients experiencing acute postoperative pain. The problem and/or barrier that arises is the acceptance of less than optimal pain control because their knowledge deficit does not allow them to know otherwise.
It is now 2330 on initial assessment. My patient is sleeping and no PCA has been used and respirations are 20. Within a half-hour, 2400 hours, patient is awakened by roommate and has now used 3 mg of PCA. By 0140 hours the patient is complaining of pain in his right hip. It is now at 8/10 and has now used 7.5 mg. Demands are 20 [number of times patient pushes the IV PCA button but does not get anything because in lockout], injections 5. Instructions reinforced with lockout time of 10 minutes. Encouraged patient to push button when out of lockout, which he did and patient repositioned to left side. No increase dose at next interval. Now 0220 hours and the patient continue to complain of pain. He says pain is in the groin area, pointing to the left side of the leg. At 0230 hours, I increased the dose to 2 mg. At 0330 hours the patient is sleeping. At 0400 patient awake again, continues to complain of pain. Encouraged using PCA. He has now used 23 mg. Ice pack to right hip. Query spasms. At 0430 – patient still awake. Complaining of burning in operative area. Now has used 32 demands and 16 injections and has used 27.5 mg PCA. IV checks by float is patent and patient repositioned. Has slept very little tonight. Float states patient slept very little last night due to noisy room. Queries sleep deprivation. At 0510 hours – pain now 5/10, demands 33 injections and injections 18. Patient a little more relaxed but tired. Patient continues to complain of pain to right groin and buttock. Able to dorsi and plantar flex as well. Will pass information on to [the next shift] 0700 - 1500 hours.

In this scenario, three hours lapsed before the participant accessed the IV PCA physicians' standing prn orders for uncontrolled pain. The *assessment phase* lasted three hours. During the *assessment phase* the following assessments and observations were made:

- the patient self-reported pain at a level of 8/10;
- the patient made 20 unsuccessful demands;
- the participant provided patient teaching and encouraged the patient to push button when not in IV PCA lockout.
- ice pack was provided;
- the IV site was patent;
- the room was noisy; and
- the participant queried spasms.

Although the patient's pain continued throughout the night, this participant did not continue intervening with the IV PCA physicians' standing prn orders after the initial prn order was accessed.
to increase the IV PCA dose (i.e., decreasing the lockout, calling the anesthetist to facilitate achieving an acceptable patient comfort goal). The participant stated that she had not established and documented an acceptable pain goal in accordance with the pain assessment/documentation standards. The participant also stated that she (the nurse) had not decreased the lockout because she (the nurse) "was just humming and hawing and procrastinating."

The pain management outcome in this clinical situation was less than optimal on this nursing shift. In other words, the patient continued to experience uncontrolled postoperative pain throughout the entire nightshift. Although the pain level did decrease to 5/10 at the end of the shift, it is unknown whether or not this pain level was acceptable to the patient. This finding highlights how important it is for nurses to assess and document the patient's pain goal in order to intervene with the patient to achieve it. It also emphasizes that nurses must have the necessary knowledge, skill, and confidence to implement the latitude physicians have given them within the context of physicians' standing prn orders to manage situations of uncontrolled pain. Situations of uncontrolled pain, including temporary pain at a level of 6 or more necessitate immediate intervention (i.e., revision of the pain treatment plan by continuing with the physician's standing prn orders). Nurses have latitude to make immediate opioid interventions in situations of uncontrolled pain and it appears that they choose not to implement this latitude. This finding has implications for future nursing practice.

Another example from the think-aloud transcriptions that reiterates these observations is as follows:

She says her pain is 7-8/10 out of a pain scale of 0-10, zero being no pain and 10 being the worst pain imaginable. She say's its okay and actually she is asking for Tylenol #3 because this is what she was taking prior to her surgery and although I have given her Tylenol plain, a couple of times for better pain control, its very uncertain whether this is helping or not. It seems to be sometimes and sometimes not. She is not in the CPM now and yet it seems that she is saying her pain is increasing. Yet by looking at her she does not appear to be having more pain. It's just what she's telling me. She does not appear to be tense or restless or
perspiring or anxious or anything, but yet there it is. I'm not sure if it's not an idea to try and get her onto Tylenol#3, maybe tomorrow and if that wouldn't be better for her pain control than morphine. Maybe, maybe not.

In this think-aloud, the participant identified the patient's pain level using a numeric pain scale but did not identify the patient's acceptable pain goal. There is no evidence of opioid side effects in this situation. The participant added the administration of Tylenol plain medication in addition to the IV PCA morphine rather than titrating with morphine in the context of the physicians' standing prn orders for uncontrolled pain. The participant stated, "but essentially when the pain level is high I do add Tylenol plain. Just as something to help bring down the pain level without increasing sedation." This example also reveals the discrepancies between the patient's self-report of pain and the participant's interpretation of their behavior. Again, the participant had latitude for decision making within the context of the physicians' standing prn orders to titrate with opioids but chose not to do this but to titrate with the non-opioid, Tylenol plain.

**Contextual factors influencing decision**

Contextual factors influencing the wait and watch decision related to time, resources and the environment. Time varied and involved the "assessment phase" which ranged between one and three hours prior to implementing the physicians' standing prn orders for situations of uncontrolled pain. The resources utilized generally involved only the patient and the nurse; anesthetists were not routinely consulted to manage situations of uncontrolled pain in accordance with the physicians' standing prn orders. In other words, because the participants did not typically implement all three of the physicians' standing prn sequential orders for uncontrolled IV PCA pain, the participants did not initiate calling the anesthetist to collaborate with them in these situations. If anesthetists were present and/or visible in clinical practice (as per the example cited in immediate decision making) then they were consulted. In the first example cited, the participant considered the patient's noisy room to be a contextual factor
contributing to the patient's experience of uncontrolled pain. However, in the second example, the environment indirectly pertains to the availability of the anesthetists. Although the anesthetists are responsible for the IV PCA program 24-hours per day, 7 days per week, they are not physically present in the building between the hours of 7pm and 7am and weekends. If the anesthetists were present on the nursing unit, the participants readily accessed their expertise. However, if the anesthetists were not physically visible, the participants did not typically phone them. This is an influencing factor in the wait and watch decision. The participants suggested there could be a more active role by the anesthetists in postoperative IV PCA pain practice. For example:

It would be great if they [anesthetists] could come in every day before they start surgery. That would be wonderful because then we'd have had report and we could tell them what's working, what's not, what we need, we wouldn't be bothering them so much. We wouldn't be as frustrated with that. I think that would be nice.

A strong theme that emerged was the participants' interpretation of time in relation to patient demands and lockout time. According to participants, acute postoperative patients were not conscious of time. For example, patients did not have a watch, there were no clocks in the rooms, and patients could not see the indicator on the pump technology that revealed whether or not the patient was in lockout or not due to the proximity of the IV PCA pump and/or the patient's eyesight. Participants actually recommended changing the pump technology to include a light that indicated to the patient whether or not they were in lockout or not.

In summary, factors influencing the decision to wait and watch (see Table 3) include the participants' assessment phase which is used to determine if the patient understands how to use IV PCA and if the patient is able to 'hit' the IV PCA button. During the assessment phase immediate nursing interventions are implemented such as reinforcing the IV PCA teaching and/or encouraging the patient to 'hit' the button to facilitate assessing and getting to know the patient. If these interventions fail and
uncontrolled pain persists, participants may implement the physicians' standing prn IV PCA orders but they do not generally and simultaneously access all three of the orders, which includes collaboration with the anesthetist.

**Decision: Do Nothing**

The do nothing decision type provided insight into the realm of ethical decision making in clinical nursing practice specifically in relation to how study participants perceived ethical dilemmas and how these dilemmas affected their work. An ethical dilemma can occur when conflict surfaces among duties, loyalties, rights, and/or values (Levine-Ariff and Groh, 1990). "Moral distress occurs when one knows the right thing to do, but institutional or other constraints make it difficult to pursue the desired course of action" (Raines, 2000, p. 30). The following excerpts illustrate an ethical dilemma and the moral distress experienced in relation to involvement in this issue; that is, "knowing or deciding" what the right thing to do was, but not being able to act on or implement that decision in that particular contextual situation.

I have only observed one incident of a nurse who actually reached over and depressed the button. This actually occurred very recently. Exactly how I meet my responsibilities in interacting with that nurse around the issue of the button being pressed by other than the patient, I'm not certain how that will be done. ... It [the control button] was right in front of the patient. I was out of my element. It wasn’t my patient and I stepped back. I withheld - I chose not to say anything. Another time, another place, another ward, another patient.... And that’s when I stood back in mild shock, disbelief and I didn’t respond and my anxiety level went way up and I have yet to deal with it.

**Assessment to Support and Evaluate Decision.**

The decision to do nothing in the context of IV PCA management and ethical judgment was infrequently encountered within this sample population; however, the ramifications are significant to the development of the revised analytic framework. The aforementioned narrative and decision to do nothing involved the participant watching another nurse contravening the established IV PCA standards. For example, another nurse immediately intervened by pushing the patient's IV PCA button for pain control
rather than allowing, encouraging or teaching the patient to do so. The immediate intervention of pushing the IV PCA button for pain control is a direct violation of the organizational IV PCA standards. Nurses and patients are taught that it is the sole responsibility of the patient to push the IV PCA button not the responsibility of the nurse, physician or anyone else. There is an expectation in the IV PCA program that health care providers and/or patients' families do not push the patient's IV PCA button for pain control to promote patient safety and prevent untoward side effects. The following narrative reinforces this IV PCA practice with respect to the decision to immediately intervene by teaching/reinforcing the teaching that the patient has sole responsibility to push the IV PCA button for pain control.

Frequently in the last number of years, it has been my assessment that nurses and/or physicians have been strongly inclined to want to depress the PCA button that normally is under direct patient control to administer a dose of PCA. On the occasions that I have been present when it was apparent that that was a possibility that a nurse colleague or physician might reach over and depress the button, I would intervene by way of teaching the patient and 'the patient', I would put that in quotation marks, I would teach the patient loudly and immediately about the fact that only he/she, that is the patient, could administer the PCA dose and that no nurse and no physician, no family member could do this. Usually when I had done this 'teaching' to the patient, it was apparent that there was going to be no one reaching over to depress the button other than the patient.

Therefore, the decision to immediately intervene by pushing the patient's IV PCA button is not an expected standard of practice in the IV PCA program within this organization. Consequently, the participant made the decision to do nothing (or was unable to do anything) in this situation while simultaneously experiencing the emotional consequences of shock, disbelief and anxiety. Furthermore, this ethical issue remains unresolved in clinical practice.

The relationship of knowledge to practice.

The study participant knew and understood the IV PCA program standards of practice, including the philosophy of IV PCA and the concept of patient control i.e., the patient is in control of their pain and has sole responsibility for pushing the IV PCA button for pain control. According to the study participant:
My professional responsibility within the IV PCA program is not to touch it [the button] but to re-teach them [patient], to re-prompt them and to in the process, all of that, to re-evaluate where they [the patient] are at. ...So, yes, the inclination I’ve wanted to reach over and hit it [the IV PCA button]. Would I do it? No, I couldn’t because it defeats the entire set-up.

In this narrative, the participant experienced an ethical dilemma between knowing the IV PCA standards of practice and the necessity to confront a colleague regarding the application those standards in practice. The participant knew what the right thing to do was but was not able to act on or implement that decision in this particular context due to a shock reaction. In this conflict situation, the participant made the decision to nothing. The decision to do nothing involved a complex situation in relation to professional nursing practice between knowing the standards of practice and the challenges of risk taking behavior in the culture in which we work.

**Contextual factors influencing decision.**

At the time of this research study, some time had lapsed between the think-aloud session and the follow-up interview between the participant and researcher. However, the participants' recollection and ability to articulate both the ethical dilemma and her response to it was vivid and succinct. The factor of time is apparent in this situation because the actual ethical encounter had occurred a significant time in the past; the participant had not clarified the ethical principles involved and had not determined the most ethical course of action to resolve the ethical dilemma. Contextual factors influencing the decision to do nothing related to time, resources and environment (see Table 3).

The context is that I was not on my turf. I was not working in an area that was my area.... So, now I’m in an area where I’ve got some anxieties around the fact that I’m out of my element, albeit that I’m safe. I’m safe practicing there, but if I didn’t feel safe I would be saying that to somebody. So I’m safe there, but I’m not comfortable. So here’s somebody else who it is their turf. It’s their area. It’s their patient. So fill in the blank on all of that. This was that nurse’s patient in their area, not my patient. I’m out of my water, in over my head as it were terms of – I’m safe but it’s not my area. So that’s the context that caused me to step back. I saw somebody with expertise in their clinical area using the PCA system and my – and I think the other context was that I was shocked. I was astonished. I was taken by surprise. I think in retrospect that I may not be as surprised the next time. I might be anticipating it and I might have – well the other
context is that for future interventions, what's the level of consciousness of the patient in front of
the patient? Do I want to confront another nurse at the exact time it happens? Do I want to make
an issue, therefore calling into question from the patient’s perspective, what the hell is going on?
Has a mistake happened? What's going on? I'm seeing two professionals disagree about my
treatment. That could undermine, undercut, not just the PCA system but the entire – part of it is
rationalizing, but when you say put it in context, that's my context. It was right in front of the
patient. I was out of my element. It wasn't my patient and I stepped back. I withheld – I chose
not to say anything. Another time, another place, another ward, another patient, I might....

This participant was not aware that this incident was an ethical issue when it occurred. Upon the
participant's reflection and her opportunity to discuss it via the research process, the study participant
gained an increased awareness of the constraints in the environment and the long-term negative
psychological effects of not acting on the moral decision at the time; i.e., "a stone in the shoe".
Retrospectively, the participant rationalized (justified) her decision to do nothing because she was not
aware of it at the time of the incident. As she explained:

It may be that – and this is justifying my decision not to say anything – in retrospect because I
certainly was not aware of it at the time. I was not aware of the dynamics of my decision not to
act, at least totally aware.... But subsequently I haven't dealt with it and that's – that's the issue
I'm stuck with and having to live with, but it's not something I live with. It's a stone in the shoe
and I've got to deal with it.

The fact that the participant raised and discussed this ethical dilemma during both the think-aloud
session and the follow-up interview suggests that it may have provided her with the opportunity to move
toward restoring her psychological equilibrium and resolving the conflict.

In raising and confronting this ethical dilemma during the research process, the participant sought
to clarify the ethical dilemma. In exploring this ethical dilemma out-loud, the participant proposed that
the ethical conflict involved a personal risk in relation to taking a stand on the professional standard(s) of
practice (IV PCA or otherwise) versus maintaining long-term cultural working relationships. The
participant also alluded to the notion that perhaps she did not have the necessary skills required to resolve
this issue such as the ability to provide peer feedback. Interestingly, the participant did not access any
resources to facilitate resolving these issues prior to the research study given those ethical dilemmas are inherent in day-to-day clinical practice.

Because as I work with my colleagues and with the physicians, there’s a personal risk. I’m going to work with my colleagues for the next number of years, I hope, and that means over the next number of months and years to come do I want to say something in such a way that there is going to be damaged working and personal relationships, which ultimately means poorer end results, poorer patient care. So the diplomacy and the soft glove approach behind feeding back or intervening or interacting with my colleagues on an issue about standards, PCA or otherwise, at what point do I push it? How do I push it? How do I choose my words? ... At what point do I soft-pedal to maintain a working relationship and in soft-pedaling I’m compromising the very issue I’m trying to raise. It’s not being heard or it’s not being understood and so – and that’s based on the fact that I was soft-pedaling to maintain a working relationship. So, now I have to justify, is the trade-off going to damage working relationships or am I going to take a stand on the issue?

In summary, the factors affecting the decision to do nothing (see Table 3) include: knowing the IV PCA standards, shock/disbelief, anxiety, lack of awareness of ethical issue(s) and how to resolve them, personal risk, fear of confrontation. Contextual factors influencing the decision not to intervene include time, resources and environment. When this decision type was used, less than optimal pain management outcomes occurred such as unresolved ethical dilemma(s), moral distress, negative psychological effects related to not acting on the moral decision, and the standards of practice in the IV PCA program were not consistently met. A less than optimal outcome for the patient was that the nurse was pushing the IV PCA button for the patient that breached the standards of practice in the IV PCA program in this agency.

The decision to do nothing, although rare in this study, does introduce the complexity and stress within professional nursing practice including the magnitude and multitude of knowledge, skills, and abilities required of a registered nurse in clinical practice. A lack of any of one of these skills may contribute to less than optimal pain management outcomes. This finding is a significant practice issue for nurses and has implications for future nursing practice.
Reflexive Journal

The following findings are from my reflexive journal. The reflexive journal helped me to gain an increased self-awareness about myself as a student conducting research, and how rewarding it was to conduct research with my peers. Initially, I found the interview process challenging because, at the time of the interviews, I had completed an extensive review of the literature immediately prior to beginning the interviews. I experienced tension during my transition phase because I was still very academically focused and found myself initially comparing the participants' views to the findings in the literature. I became aware of this tension during a conversation with my thesis supervisor and realized this bias. Once I was aware of what I was doing, I was able to let go of the findings in the literature review and fully engage in the participants' lived experiences.

Through the reflexive journal process I also gained an increased awareness of how rewarding it was to participate in nursing research in clinical practice. The participants in this study had never been involved in nursing research so for them this was a welcome and exciting opportunity. The participants continually revealed how they had gained insights into their own practice through the think aloud sessions and in collaboration with me which was very rewarding. I felt honored to have had the opportunity to work with this group of nurses who I believe were open and honest. A strong sense of mutual trust and respect also existed. Therefore, I believe I made the right research decision to conduct this study in a setting in which I worked and that I did not "go native."

Summary

In this chapter, the findings concerning participants' post-operative pain management using the modality of IV PCA are presented. Analysis of the study participants' comprehensive reflections during their think-aloud sessions revealed the ambiguity between the concepts of expert and expertise in IV PCA practice and three possible decisions; that is, immediate intervention, wait and watch with potential
intervention at a later time and no decision. These decisions were mediated by the influencing and contextual factors of time, resources, environment, knowledge, assessment, beliefs/biases and patient behavior. The possible outcomes of these decisions are optimal or less than optimal pain management. These findings are summarized in Table 3.
<table>
<thead>
<tr>
<th>DECISION TYPE</th>
<th>INFLUENCING FACTORS</th>
<th>CONTEXTUAL FACTORS</th>
<th>OUTCOME</th>
</tr>
</thead>
</table>
| Immediate Intervention | Nurse  
1) Basic nursing measures  
2) IV PCA related interventions | Time  
- Immediate  
- Resources  
- Pooling (using every resource available)  
- Physicians' standing prn orders not consistently implemented | Optimal = Balance  
- The nurse's ability to titrate a balance between pain and opioid side effects  
- Patient is the only one pushing button |
| | Patient  
- Behaviour  
- Expertise in IV PCA  
- Knowing the patient  
- Intuition | Environment  
- Nursing Unit/Special Care Unit | Less than optimal = Imbalance  
- Nurse pushes button for patient  
- Patient teaching/reinforcement of teaching not done |
| | Resources  
- Knowledge  
- Pooling (using every resource available)  
- Physicians' standing prn orders not consistently implemented | | |
| Wait and Watch with Potential Intervention at a Later Time | Nurse  
- Assessment  
- "assessment phase" to observe if the patient (a) understands how to use IV PCA; and (b) if they know how to 'hit' the IV PCA button  
- Knowledge  
- Lack of awareness and/or knowledge  
- Beliefs, biases  
- Lack of confidence and/or comfort | Time  
- Variable ~ "assessment phase" (amount of time to determine patient control)  
- Resources  
- Typically, the patient/nurse  
- Rarely, the anesthetist(s)  
- Physicians' standing prn orders not consistently implemented | Less than optimal = Imbalance  
- Barriers to pain management  
- Potential to move toward Optimal |
| Uncontrolled Pain (i.e. pain score of >3 on a 0–10 [worst] pain scale) | Patient  
- Behaviour  
- Understanding of IV PCA technology  
- Ability to 'hit' IV PCA button  
- Ability to self-report | Environment  
- Patient's room noisy  
- Availability/visibility of anesthetists in clinical practice | |
| To Do Nothing | Nurse  
- Knowing the IV PCA standards  
- Shock/disbelief  
- Anxiety  
- Lack of awareness of ethical issue(s) and how to resolve them  
- Personal risk  
- Fear of confrontation | Time  
- Indefinite  
- Resources  
- none | Less than optimal = Imbalance  
- Unresolved ethical dilemma  
- Moral distress  
- Negative psychological effects related to not acting on the moral decision  
- Standards of IV PCA Program not met  
- Nurse pushing button for patient |
| | Patient  
- Level of consciousness | Environment  
- Not 'own turf'  
- Not 'own patient'  
- In front of patient  
- Working relationships | |
CHAPTER FIVE: DISCUSSION AND IMPLICATIONS OF FINDINGS

Chapter Five is a discussion of the findings of the research study. As predicted by Thorne et al. (1997), the analytic framework developed as an outcome of critical analysis of existing knowledge in chapter two (see Figure 2) was challenged by the findings of this inquiry. According to Thorne et al. (1997), "as time passes and new meanings emerge in our theoretical literature, an explicit analytic forestructure in the records of our research will permit nurse scholars to make sense of the findings and develop increasingly complex interpretations of how they contribute to our science" (p. 173). The revised analytic framework (see Figure 3), a schematic depiction of nurses' clinical decision-making and factors influencing those decisions related to the management of IV PCA in day-to-day practice, is presented in this chapter. It will be discussed in an effort to understand how the research findings contribute to nursing science related to IV PCA in day-to-day clinical practice.

**Revised Schematic Representation of Analytic Framework**

The findings of the study generated revisions to the original analytic framework to answer the research question—How do expert nurses manage acute postoperative pain in the adult patient population using the modality of IV PCA including decision making around initiating, maintaining, and discontinuing pharmacological IV PCA therapy? Specifically, the framework was revised to capture the distinction between expert and expertise, to identify three types of decisions nurses make, and to identify that nurses implement these decisions within the context of personal and institutional factors that are either facilitating or constraining. Pain management outcomes for the patient were dependent upon the nurses' ability to titrate a balance between acceptable pain and tolerable side effects. The nurses' ability to titrate this balance depended upon their knowledge of pain management principles, in general, as well as knowledge related to IV PCA. Clinical nursing judgment and clinical reasoning based on this knowledge
were also an integral component of the decision making process. The revised framework is presented in Figure 3.

**Expertise in IV PCA Clinical Practice**

One significant revision to the original analytic framework occurred in relation to participants' perception of themselves as having expertise, rather than being experts. While all participants considered themselves to have expertise in IV PCA, approximately ¾ of the participants did not perceive themselves as being expert nurses.
Figure 3: Revised Schematic Representation of Analytic Framework

Acute Post Operative Pain

- IV PCA Expertise
- Nursing Knowledge of pain management & IV PCA

Clinical Judgment
Clinical Reasoning

Personal Influencing Factors/Barriers
- Beliefs
- Attitudes
- Preconceptions
- Confidence & comfort
- Nursing Knowledge
- Pain Management Knowledge
- Pharmacological Knowledge
- Intuition
- Previous experience
- Goals/priorities of the nurse
- Ethical/professional conflicts

Institutional Influencing Factors/Barriers
- Culture re: feedback
- Commitment and availability to education
- Accountability
- Time, resources, environment

Decisions

Immediate Intervention
Wait and Watch
Do Nothing

Pain Management Outcomes

Titrating a balance between pain and opioid side effects.

Acceptable Pain

Tolerable Side Effects
In the initial analytic framework, I indicated all nurses as expert in IV PCA therapy. However, the research findings pointed to a distinction between expert nursing practice and expertise and IV PCA therapy.

There are a number of possible reasons why participants differentiated between being an expert nurse and having expertise in IV PCA therapy. Participants may have been reluctant to identify themselves as experts because they differentiated between expertise in a distinct task (i.e., IV PCA therapy) and expertise in their entire nursing role. Interestingly, Benner et al., (1996) state that “expertise does not necessarily apply to a whole skill domain, but to at least some significant part of one. There are, perhaps no expert nurses, but certainly many nurses achieve expertise in the area of specialization” (p. 36). However, it remains unclear why the participants would not have perceived themselves as expert in IV PCA therapy when in fact, IV PCA is a specialized nursing skill requiring initial certification.

Some participants may have recognized the limitations of their knowledge and experience in IV PCA therapy, understanding how much there is to know about IV PCA therapy and how context-specific decisions can be made regarding pain management. Therefore, participants may have thought it presumptuous, perhaps even misguided, to pronounce themselves as experts in such a complex aspect of nursing care. In addition, there is little specific and formal feedback to nurses in this institution about their clinical decision making beyond performance appraisals that identify the nurse as achieving minimal standards of clinical practice. Expert decision-makers are rarely rewarded or acknowledged. Hansten and Washburn (2000) suggest that “the focus on critical thinking is an essential and timely aspect of professional development and must be facilitated through continuous and creative methods. In the movement toward outcome-based care, it is not
presumptive to propose that a new model of health care delivery will include nurses being rewarded for cognitive and critical thinking skills to achieve desired outcomes" (Hansten & Washburn, 2000, p. 24).

Some participants may in fact have been nominated as experts but functioned more in keeping with the proficient level of competence as defined by Benner and her colleagues (1996). The differentiation between proficient practitioners and experts is often indistinct to the observer. Both proficient and expert nurses appear to make competent clinical decisions and to consider the context and patterns of response (Benner, 1984). Expert nurses, however, have a deep, intuitive understanding of situations that they find difficult to articulate, even to themselves. According to Benner et al. (1996), the differentiating characteristic between a proficient and expert nurse is that “the nurse at the proficient level still has to think about what to do” (p. 142). On the other hand, “expert practice is characterized by increased intuitive links between seeing the salient issues in the situation and ways of responding to them” (p. 142). A nominator may be unable to decipher the subtle cues of expert nursing, such as perceptual acuity—recognition ability that differentiate an expert from a proficient nurse (Benner, 1984, p. 33).

The participants’ perception of expertise is a significant finding. Expertise in IV PCA therapy is an expected outcome of the education/certification program that is provided to nurses within the institution. Nurses’ competency in pain assessment, treatment and pump technology is assessed and measured against established performance standards of practice during the initial IV PCA certification/orientation process. All surgical nursing staff must master this initial competency prior to functioning independently in practice. Given that the nurses have the necessary knowledge, skill and clinical experience, it is not surprising that the integration of these skills in practice confirms with confidence and comfort, their own perceptions of expertise in IV PCA practice. This
finding is noteworthy because “despite considerable experience, some nurses never seem to achieve this level [of expertise] even in their specialized area” (Benner et al., 1996, p. 36).

At the onset of this research, I took direction from Grier (1984) who advised that skilled decision-makers are expert nurses. Although the nurses in this study were skilled decision-makers, many did not perceive themselves as experts. The findings of the research have indicated that the definition of a skilled decision maker in the context of this research should have been a nurse who has developed expertise in relation to IV PCA therapy and the management of acute postoperative pain in the adult patient population, rather than an expert nurse, as was originally determined. It is imperative that there be clarity in understanding the terminology of skilled decision making in nursing practice as “decision-making is a critical component of nurses’ work, with this expertise one of the principal skills characterizing professional nursing” (Boblin-Cummings et al., 1999, p. 6). Further research is required to determine the antecedents, consequences, and attributes of expertise versus expert.

The participants’ distinction between having expertise and being an expert has important implications to the sampling processes for research about expertise in nursing. Clear and refined sample criteria for recruitment of expert nurses for the purposes of research have not been clearly established. Multiple and complex variables exist in relation to being and identifying an “expert” nurse which makes it difficult to precisely define differentiated criteria for recruitment into a research study; therefore, sample recruitment criteria of expert nurses in published research reports is often vague and lacking clear conceptualization of the attributes of expertise (e.g., three years of experience).

Initially, I attempted to recruit nurses who were nominated by nursing administrators as expert in the management of acute postoperative pain using the modality of IV PCA. The nominations were made on the basis of criteria derived from the review of relevant research and the nominators’ own criteria.
However, it became clear in the initial interviews that the nurses did not always share their nominators' perception of themselves as experts; in fact, only 29% viewed themselves as expert nurses while 100% viewed themselves as having expertise in IV PCA therapy. Further research is needed to identify the criteria that nurses use to determine expertise versus being an expert and their perception of how both constructs influence the outcomes of pain management. Such research will contribute significantly to the development of inclusion and exclusion criteria for research that entails expert nurses.

**Need to Integrate Principles of General Pain Management**

A second critical and unexpected finding in this study that necessitated amendment of the original analytic framework pertains to the differences between participants' nursing knowledge of pain management and nursing knowledge of IV PCA and how this affected their decision making. Participants generally applied what they had learned as the procedures and standards of IV PCA therapy to the care of patients with IV PCA but often did not integrate more general pain management principles in their nursing care. For example, they did not consistently apply the standards related to the use of identifying the patient's pain goal in their decisions about IV PCA. Such omissions may have occurred because whereas policies and procedures for IV PCA exist within the institution, overall standards of pain management do not. The modality of IV PCA therapy appears to have been presented to nursing staff within the institution as a component of care, isolated from the overarching standards of pain management. The general principles of pain management, such as the desired outcome of the patient's perceived acceptable pain level, are often overlooked or subjected to individual interpretation about what is best, rather than evidence-based practice and institutional requirement. This oversight requires immediate amendment to promote effective pain management and practitioner accountability within the institution.

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) recently revised (1999) their pain management standards and published a *Comprehensive Accreditation Manual for*
Hospitals: The Official Handbook (CAMH), which is accessible via the Internet. The JCAHO standards recommend that health care facilities must have continuing education strategies in place to improve pain assessment and management for all patients, not just surgical or cancer patients. This recommendation is particularly relevant in this study since 43% (almost half) of the nurses in this study had not participated in continuing education related to pain management in the previous five years. This finding is significant because organizational clinical practice standards must exist in order to promote careprovider accountability for pain management in clinical practice.

Decision-Making

The research findings contributed a more detailed understanding of the types of decisions nurses make regarding IV PCA and the factors that influence these decisions. In the original framework, no distinction was made about the kind of decisions nurses made in relation to IV PCA therapy. However, the participants identified three specific types of decisions in relation to IV PCA. These were (a) immediately intervene, (b) wait and watch with potential to intervene at a later time, and (c) do nothing. I developed a decision-making framework that was applied to each decision to guide and facilitate data analysis. I used this decision-making framework solely to analyze data; it was not conceptualized as a part of the revised analytic framework. As an outcome of analyzing data in the context of this decision-making framework, personal and institutional factors and barriers were identified that influenced all three decisions. These three decisions and factors have been added to the revised analytic framework.

The contextual factors that were identified as influencing nurses’ decision-making also determined to some degree pain management outcomes for the patient. For example, participants identified personal beliefs, biases, attitudes, and preconceptions related to pain management that resulted in patients receiving less than optimal benefit from IV PCA. In some situations, when specific information and/or nursing or pain management knowledge was lacking, participants introduced their own personal biases, beliefs and
preconceptions about pain management into the relationship, where the participant may or may not have been conscious of them at that moment in time. In other words, participants were not able to “act knowledge” because they needed additional time to continue their assessment prior to making a decision. According to McCaffery and Pasero (1999), “all of us have many conscious or unconscious biases and misconceptions that may adversely affect the care we provide for patients with pain” (p. 58). Discussing these biases etc. during the think-aloud sessions, heightened the nurses’ own personal awareness, which they suggested would influence further pain assessment and management in the future. However, it should be noted that awareness alone is not enough to change attitudes and behaviors in clinical nursing practice. For example, McCaffery and Pasero (1999) suggest that “perhaps it is best to assume that there are far too many biases to overcome and that the best strategy is to establish policies and procedures that protect patients and ourselves from being victims of these influences” (p. 58). Institutional factors also influenced nurses’ decision-making and pain management outcomes with respect to time, resources and environment.

It would appear from the findings of this study that educational programs to teach nurses about IV PCA therapy should begin with an exploration of the attitudes and beliefs that the participants have about pain management. This will provide a foundation upon which to base a discussion that contradicts or clarifies the participants’ preconceptions about this modality and pain management in general.

Intuitive Decision Making

The think-aloud approach of data collection revealed that nurses’ decisions in relation to IV PCA were characterized by intuitive links (Benner et al., 1996) by which they made clinical judgments. This finding was most apparent in the decision to immediately intervene. Although this finding can be interpreted in accordance with Lee and Ryan-Wenger’s (1997) finding where “experts apply a combination of intuition, or perceptual awareness, and extensive previous experience which is stored as
‘schemata’ in long term memory, intuition was used by participants regardless of whether they considered themselves expert or merely having expertise. This is a contradiction to the theory that only expert nursing entails intuitive practice (Benner, 1984) but supports the notion by others (Benner et al., 1996; Shamian, 1991; Whittemore, 1999) that clinical judgment is a complex knowledge-derived process. Rew (1988) found that nurses recognize intuition as a component of clinical practice in making decisions and taking action. The strength of nurses’ intuition often urges them to do something more for the patient; i.e., immediately intervene or “act knowledge” where acting knowledge is the immediate intervention.

Intuition has been added to the revised framework as a factor that influences nurses’ decision making in relation to IV PCA.

Decision Making and Judgment as Interactive Entities

In the original inception of the analytic framework, I envisioned the concepts of clinical decision-making and clinical judgment as entities unto themselves. However, this was not the finding in this research study. The findings of this study suggest that concepts of knowledge, clinical judgment, and clinical reasoning are intimately interconnected and contribute to pain management outcomes. Nurses decide to act immediately based on their clinical reasoning and judgment, which is related to their knowledge base. For example, a nurse’s knowledge of IV PCA and pain management influences his or her understanding of what is happening and the judgment to act immediately, wait and watch or do nothing. The decision contributes to either optimal or less than optimal pain management outcomes, depending upon the appropriateness of the decision for the situation. The analytic framework has been revised to depict the interactive nature of clinical reasoning, knowledge and judgment.

The interactive relationship between knowledge, judgment and reasoning has been identified by Boblin-Cummings et al. (1997) in their investigation of decision making by nurses. According to these researchers, “past descriptions of decision making identified that planning [in the nursing process] does
occur prior to implementation, but the complexity of decisions within this phase has not been recognized. These decisions are categorized as implementation decisions” (p. 7).

Boblin-Cummings et al., (1999) presented the following as implementation decisions entailed in nurses’ decision-making:

- "{Who} Who should be involved in implementing this intervention?
- {What/How Much} What resources are required to implement this intervention?
- {How”} How will these individuals be involved? How will these resources be obtained and used? How will this intervention be implemented?
- {When} How will these resources be obtained and used? How will this intervention be implemented?
- {Where} Where should this task be implemented?” (p. 8).

This framework is congruent with the findings of the research study. The nurses in this study first determined who should implement the desired intervention. The intervention was implemented by the nurse caring for the patient or by another individual within or external to the nursing unit. For example, one nurse consulted an orderly to perform a male catheterization when the patient experienced the opioid side effect of urinary retention; the nurse lacked the expertise to perform this skill.

Then the participants determined what resources were required to implement this intervention. This determination also referred to the amount of personal energy expended by participants in relation to their own willingness to invest as a resource. The participants decided how the intervention would occur based on their knowledge of accessible resources and their knowledge and previous experience of similar cases. For example, the participants had the option of consulting the anesthetists in the context of the physicians’ standing prn orders, rather than surgeons, to implement a desired intervention because the anesthetists were the allocated personnel to the IV PCA program within the institution.
The decision about the timing of the intervention was made in accordance with the nurse’s understanding of immediate priorities in the situation. According to Boblin-Cummings et al., (1999) “these decisions address the complex network of interactions involved with enactment of the nursing role; the repertoire of leadership skills required to elicit the involvement of other individuals; discretionary decisions made in the allocation of resources; priority setting; and strategizing. Implications of these findings extend to nursing competencies; quality of care; cost-effective delivery of health care; and nursing education” (p. 11).

Factors Affecting Decision Making

The findings of this study have contributed to a clarification of the role of nurses’ knowledge and attitudes about pain management and IV PCA in their decision making in relation to IV PCA. The study findings indicate that lack of pain management knowledge (e.g., general principles of pain management) and inappropriate attitudes toward pain management (e.g., biases, beliefs, and preconceptions) interfere with the assessment of pain and the pharmacological management of pain and contribute to less than optimal pain management outcomes. This finding is consistent with that of other researchers (Clarke, French, Bilodeau, Capasso, Edwards, & Empoliti, 1996; Ferrell, McGuire, & Donovan, 1993; Lebovits, Florence, Bathina, Hunko, Fox, & Bramble, 1997; Marks & Sachar, 1973; Max, 1990; McCaffery, Ferrell, O’Neil-Page, & Lester, 1990; Watt-Watson, 1987).

Pain management outcomes were frequently less than optimal because the participants recorded that the patients continued to have uncontrolled pain. During the think aloud transcriptions, the participants may not have been aware of this because it was not common practice to use the patient's identified comfort goal or acceptable pain level to guide their decision making. Typically, the patient self-titrates pain by administering small opioid doses within the context of the physicians' preprogrammed orders. However, in situations of uncontrolled pain, that is, when the physicians' preprogrammed orders
fail to control pain, the nurse should intervene within the context of her practice by implementing physicians' standing prn orders in an effort to continue opioid titration and manage uncontrolled pain. In addition, patients may also experience dose-related opioid side effects in which case the nurse should intervene to titrate against opioid side effects again, using the parameters of the physicians' standing prn orders. In this research study, participants did not sequentially and incrementally implement the physicians' three standing prn orders (increase PCA dose, decrease lock-out, and call anesthetist) for situations of uncontrolled pain, which meant that anesthetists were rarely accessed in the postoperative IV PCA program. Therefore, pain management did not typically include a triad of decision making between the patient, nurse, and anesthetist; rather decision making primarily involved the nurse.

Participants in this study identified that a lack of pharmacological knowledge was a deterrent in managing IV PCA, particularly forgetting what has been learned in nursing school and not entirely understanding the administration of drugs used to manage opioid side effects. The participants offered several recommendations to improve pharmacology management in IV PCA, including frequent "refresher" education sessions and educators who ask nurses questions about why and how specific drugs work. They frequently commented that the think-aloud strategy used in this study helped them to become more aware of the limitations of their knowledge and the inconsistencies and incongruities in their decision making. They recommended the think-aloud technique as a means to stimulate reflection about IV PCA decision making. Max (1990) also suggested giving practitioners tools for change; i.e., educational efforts should interface closely with practitioners on the units as close to the time of action. This recommendation is particularly relevant in this study because all participants indicated that they had gained increased awareness of their own pain management practices (or lack thereof) as an outcome of this research study.
Influencing Factors and Barriers

In the research, nurses identified several barriers to the effective implementation of IV PCA therapy. These include personal and institutional barriers. Personal barriers have been discussed previously in this chapter; they include nurses' inadequate knowledge, inappropriate attitudes, and inadequate pain assessment based on misguided beliefs, attitudes and preconceptions. As well, nurses did not always administer adequate opioid doses as dictated by the physician's standing prn orders. For example, in the IV PCA program a standard exists in the context of the physician's standing prn orders to increase the PCA dose, decrease the lockout, and call the anesthetist to achieve the patient's identified acceptable pain goal. Since improving pain management begins at the bedside, nurses are responsible for administering adequate doses within the physician's standing prn orders. (McCaffery and Pasero, 1999).

In addition, there was evidence that some nurses perceived a lack of accountability for pain relief, contrary to CAMH guidelines. “All patients have a right to pain relief” (CAMH, 1999, p. 1). This perception is related to their lack of participation in regular pain management continuing education inservices. Almost half of the participants in this study had not participated in pain management continuing education in the preceding five years.

A number of cultural barriers were identified in the research findings. Culture may be defined as “a system of shared values, beliefs, and understanding about what words and action mean and the ways in which these values and beliefs are expressed…Culture also refers to the “distinctive knowledge, habits, responses, ideas, language, and ways of living, working, or playing shared by a group…Culture, then, is a potent force in shaping beliefs, moderating behaviors, and giving meaning to experiences” (Walker, Tan, and George, 1995, 48-49). For example, the participants described the institutional culture as having reluctance and an inability to provide peer feedback about pain management practices that are perceived as incorrect. They believed that this was largely due to their lack of skill in giving feedback to peers about
their clinical performance. "Being able to give this type of feedback [peer feedback] accountably is an underdeveloped skill in many organizations" (Weaver and Ringhouse, 1997, p. 302). Weaver and Ringhouse (1997) indicate that such skills are essential to be able to "support excellence in turbulent times" (p. 301). Other aspects of institutional culture identified by participants included that pain has remained largely invisible due to the lack of an institutionally established standard of pain as the fifth vital sign. The participants indicated that there are no formal monitoring programs within the institution or evaluation of pain management outcomes. As well, they stated that there are no institutional standards for pain management and there is minimal coordinated interdisciplinary approach to pain management in the context of continuous quality improvement initiatives. The participants were not aware, for example, of the existence of current pain management standards available in the Comprehensive Accreditation Manual for Hospitals (CAMH). In addition, they perceived little institutional support for continuing education for nurses and ongoing monitoring of pain management by nurses. They stated that they knew of no drug utilization reviews to monitor prescribing patterns/trends of opioids or cost analyses of IV PCA determined by outcomes of unrelieved pain such as extended length of hospital stay, rates of IV PCA usage during hospitalization, and unplanned outpatient visits for pain.

Max (1990) was instrumental in recognizing and recommending "action steps" to alter knowledge and attitudes in an effort to change pain management practices and behaviors, including documentation of IV PCA decisions on the patient's chart and bedside tools. According to the participants in this study, the IV PCA Flowsheet at the patient's bedside is well-used in clinical practice, whereas the interdisciplinary progress notes of the patient's chart are frequently neglected in documenting IV PCA decisions. This may reflect the proximity of the flowsheet to the nurse's bedside work; it takes time to walk to the nurse's station to locate and obtain the patient's chart.
Joel (1999) reiterated Max's (1990) recommendations to make pain visible and linked this thinking to clinician accountability. Joel stated, “pain as the fifth vital sign would be a tangible indication of nursing’s accountability for comfort care, making it impossible to easily explain away the persistence of pain and discomfort. Recognition of pain as a quality indicator in administrative rules, standards of practice, peer review, clinical ladders, certification, and accreditation criteria and critical paths is an essential first step” (p. 9). McCaffery and Pasero (1999) also echo the message that pain becomes the fifth vital sign. “One simple strategy to increase accountability for pain is for an institution to make pain intensity ratings a routine part of assessment and documentation of vital signs...This makes pain visible and raises awareness of the problem. If pain ratings can be attached to an activity as routine as vital signs, clinicians will receive frequent reminders of existing pain problems” (p. 3).

Max (1990) also recommends increasing clinician accountability by formally reviewing pain relief procedure outcomes that would increase consciousness of pain relief in clinical practice. Clinician accountability is a key factor in achieving optimal pain management outcomes. For example, during the analysis of these findings it became apparent that a formal IV PCA program evaluation had not been done. This will require more than clinicians’ willingness to engage in evaluative activity. It will also require institutional support in terms of education, evaluation, and feedback to practitioners. “New knowledge often motivates learners and promotes the desire for change, but a lack of organizational support at the practice level, especially when educational concepts are complex hinder practice changes” (Czurylo et al., 1999, p. 85).

**Ethical Considerations**

In the earlier formation of the analytic framework, the place of ethical considerations in decision making about IV PCA was not included. However, the research findings point to the significance of ethical considerations, particularly when no decision was made. Although no decision was rare in the
course of the research, it is an area that merits further examination because it always occurred when the participants experienced an ethical dilemma in response to a practice by another staff member that they believed was inappropriate or wrong. According to Chally and Loriz (1998) an ethical dilemma is defined as “a difficult moral problem that involves two or more mutually exclusive, morally correct courses of action” (p. 17). One of the factors influencing no decision was a lack of knowledge about ethical decision-making to solve an ethical dilemma. Few participants implemented any of the steps of ethical decision-making as identified by Chally and Loriz (1998) when they were confronted with an ethical dilemma. For example, they did not consider or consult others about the effect of context in the particular situations. The participants were well aware that they lacked the ability to make ethical decisions in such situations. It is not clear if the participants would have chosen an alternate decision (i.e., to intervene or to wait and watch) if they had been able to make the ethical decisions that were required when they were presented with an ethical dilemma. This would provide an interesting question for future research.

The participants’ difficulty in making an ethical decision to intervene was exacerbated by their fear and anxiety in such situations. Bay and Algase (1999) developed a process model of fear and anxiety in which one of the antecedents of fear is a change in environment, such as an ethical dilemma and the consequences include avoiding danger, survival, and long-lasting fear memory, all of which was reported by the participant. Bay and Algasse propose that one potential by-product of anxiety is personal growth. The potential for personal growth is inherent in situations involving ethical dilemmas in regard to IV PCA; however, this outcome can only be realized if nurses experiencing such dilemmas have a framework to guide their thinking/feeling at the time and if there are opportunities for the nurse to reflect upon and debrief about the incident later.

In Bay and Algasse’s model of fear and anxiety, it becomes apparent that when participants’ made no decision, in fact that was their intervention. They intervene to protect themselves from retaliation from
the reaction of peers who they may be seen as criticizing. This was exacerbated because of the pervasive "conspiracy of silence" that existed within the institution; i.e., it was expected that nurses would not say anything negative about one another and to one another.

Summary

In Chapter Five, I discussed the research findings, according to the revisions they generated to the analytic framework that was initially developed in Chapter Two. It would appear from the findings of this study that any resolution to the problem of ineffective IV PCA management must address both personal and institutional factors/barriers. For example, although many participants had not attended continuing education about IV PCA in recent years, they stated that the institution had not offered such sessions to their employees. The findings in this study also suggest that pain management outcomes may be less than optimal because comprehensive standards do not exist in relation to acute postoperative pain management. This begs the question—How can practitioners be held accountable for pain relief, if pain remains invisible in practice? Herein lies the challenge to change knowledge and attitudes in an effort to promote quality patient care in pain management. A number of clinical, educational and research directives have been identified within this chapter. Although each promises to make a substantial contribution to the resolution of the issue of ineffective IV PCA management, these must not occur in isolation of one another in order for the issue to be entirely resolved.
CHAPTER SIX: SUMMARY, CONCLUSIONS AND IMPLICATIONS

In Chapter Six, I will summarize the research process, identify the six major themes found in the research findings, and discuss implications of the findings for nursing including clinical, education and research. I will also identify teaching strategies and/or interventions to assist nurses in making expert clinical nursing judgements in the management of IV PCA. The research participants revealed that gaps between what we know about the factors influencing nursing decision making in IV PCA pain management and what nurses need to know still exist in relation to providing care that results in optimal pain management outcomes.

Summary

The purpose of this study was to answer the research question--How do expert nurses manage acute postoperative pain in the adult patient population using the modality of IV PCA including decision making around initiating, maintaining, and discontinuing pharmacological IV PCA therapy in day-to-day clinical practice? Interpretive description was used to explore this research question because it is a suitable method for examining previously unexplored experiences; it allows one to move beyond description to engage in interpretations of study participants.

I determined that there was a paucity of nursing knowledge related to how nurses make decisions and the factors influencing expert nurses’ decision-making regarding IV PCA in day-to-day clinical practice. This gap in nursing knowledge prompted this study. This study seeks to explore and expand nursing's body of knowledge by beginning to understand what expert nursing care means in the context of managing pain using the IV PCA modality. The study findings provide useful direction to further nurses' knowledge of IV PCA and emphasize the need to develop more effective strategies to apply knowledge to improved patient care.
Theoretical sampling was used which limits the sample size to achieve theoretical saturation. Theoretical saturation assumes that further interviews would have elicited already known information. Therefore, one can assume that interviewing a larger sample would have led to similar results. However, a limitation of the interviews in this study was that they only provided information on factors perceived and indicated by nurse participants. Other factors and reasons for the participants' decisions may also be important. Future research using complementary methods, additional data sources (for example, pre-admission nurses, PACU nurses) or alternative sampling may provide more insight into other factors which affect nurses' decision making and which are more salient.

Seven nurses, nominated by peers using specified sample criteria, participated in the study. I initially interviewed the participants with semi-structured interview questions about their experience with IV PCA. Further data were collected through participants' recorded think-aloud technique. A post-think-aloud interview outline for each participant was developed and used to guide each interview based on relevant literature and current findings in each think aloud transcription. The literature review included an extensive and comprehensive analysis of the concepts of nursing knowledge of pain management, IV PCA, decision-making, and clinical judgment. The think-aloud technique permitted the nurses to reflect on their nursing practice.

Analysis of verbatim transcripts of the initial interviews and think-alouds revealed types of decisions made and factors influencing decision-making. These were then defined and categorized. Two-hour follow-up interviews were conducted, transcribed and analyzed. My reflexive journal contributed to the process of data analysis and synthesis. Final analysis revealed three decision-types that participants made when managing acute postoperative pain using IV PCA: (a) immediate intervention, (b) wait and watch with potential intervention at another time, and (c) to do nothing. Factors influencing these decisions were both personal and institutional in nature.
The decision to immediately intervene included intervening with basic nursing measures and interventions related to managing postoperative side effects. The immediate nursing intervention did not include implementing the physicians' standing prn orders to manage situations of uncontrolled pain. Basic nursing measures included such things as positioning and mobilizing. Managing opioid side effects included pharmacological interventions such as administering an anti-emetic for nausea and vomiting. Interestingly, in this study, the decision to immediately intervene was never used in situations of uncontrolled pain. In other words, participants never immediately accessed the physicians' standing prn orders to assist with opioid titration when it was evident that the patient was experiencing pain. This is a very significant finding in this study because basic nursing interventions are used first to manage uncontrolled pain, then pharmacological IV PCA interventions are used to manage opioid side effects, and finally, nurses implement physician's standing prn orders with request to opioid administration.

The wait and watch decision with potential to intervene at another time was always used to assess patients in situations of uncontrolled pain. Participants engaged in what I termed an assessment phase, which lasted between one and three hours. During this assessment phase, participants would determine if the patient understood the pump technology and/or was able to speak English. In the wait and watch decision, if an intervention were required to manage uncontrolled pain, the participants would access the physicians' standing prn orders after utilizing basic nursing interventions and when it became apparent that these nursing interventions were ineffective to manage pain. Participants always utilized the first physicians' standing prn order; that is, to increase the PCA dose. Participants seldom continued to implement the physicians' standing prn orders, for example, decreasing the PCA lockout, calling the anesthetist. Participants rarely accessed the anesthetists and typically patients continued to experience uncontrolled pain. In addition, nurses with expertise in IV PCA therapy did not routinely access the Clinical Resource Nurse as a resource in day-to-day nursing practice.
The decision to do nothing, although rare, occurred in the context of an ethical dilemma and is worthy of discussion because it introduced an additional set of issues in relation to IV PCA nursing practice.

Personal and institutional factors/barriers influenced all three nursing decisions. Personal factors included beliefs, attitudes, preconceptions, confidence/comfort, nursing knowledge, pain management knowledge, intuition, opioid pharmacology knowledge, previous experience, goals/priorities of the nurses and ethical/professional conflicts. Institutional factors included the culture regarding feedback, availability and commitment to continuing pain management education, the institutional commitment to foster attendance at continuing education sessions and time, resources, and environment. All of these personal and institutional factors/barriers are illuminated in relation to clinical practice standards, accountability for these standards, and through continuing quality improvement initiatives.

Interpretation of Findings

Based on my interpretation of the findings, I have generated the following conclusive statements:

1. There is a distinction made by nurses between having IV PCA expertise and being an expert nurse in IV PCA therapy.

   Clear and refined sample criteria for recruitment of expert nurses for the purposes of conducting research is currently vague and lacks a clear conceptualization of the attributes of being an expert generally and specifically. This has important implications to the sampling processes for research, necessitating future research to determine the antecedents, consequences and attributes of expertise versus expert.

2. Nursing knowledge related to pain management and IV PCA, clinical judgment and clinical reasoning are intimately interconnected and contribute to nurses' decision-making and pain management outcomes.
The apparent lack of pain management knowledge and inappropriate attitudes toward pain management interfered with the assessment of pain and pharmacological management of pain and contributes to less than optimal pain management outcomes.

3. Participants made three types of decisions when caring for patients experiencing acute postoperative pain and receiving the modality of IV PCA in day-to-day clinical practice. The decisions were to (a) immediately intervene, (b) wait and watch with potential intervention at a later time, and (c) to do nothing.

4. Personal and institutional factors/barriers influenced all of these decisions (see #3). Personal factors include beliefs, attitudes, preconceptions, confidence and comfort, nursing knowledge, pain management knowledge, pharmacological knowledge, intuition, previous experience, goals/priorities of the nurses, and ethical/professional conflicts. Institutional factors include culture re feedback, commitment and availability of education, the need to identify pain as the fifth vital sign to promote visibility and accountability in practice and time, resources and environment. It is a combination of the personal and institutional factors/barriers that affect the application of knowledge as well as the knowledge gaps in providing care to the IV PCA patient population.

5. Pain management outcomes resulting from nurses’ decisions in regard to IV PCA were usually less than optimal.

Achieving optimal pain management outcomes using the modality of IV PCA meant titrating a balance of pain against opioid side effects. Participants almost always used pharmacological interventions to manage opioid side effects. Participants did not immediately implement the physicians' standing orders to manage situations of uncontrolled pain; if they did decide to access these orders, it was only following unsuccessful basic nursing interventions. This reveals a gap in nursing practice in relation to maintaining a balance between pain and opioid side effects.
6. Nurses did not consistently implement physicians' standing prn orders to optimally manage acute postoperative pain using IV PCA.

In Chapter Two, I established that physicians have both a legal mandate and authority for prescribing opioids while nurses have latitude for decision making in implementing physicians' standing prn orders. Evidence suggested that both physicians and nurses had knowledge deficits related to opioid pharmacology, which compounded and contributed to the problem of inadequate and ineffective acute postoperative pain management. Study findings indicate that participants did not consistently and incrementally implement the physicians standing prn orders for situations of uncontrolled pain within the specified time frames while using IV PCA.

**Implications for Nursing and Recommendations**

The provision of adequate and appropriate acute postoperative pain management is a 24-hour a day responsibility for health care professionals, particularly nurses who spend more time with patients in pain than any other member of the interdisciplinary team in acute care settings. Findings in this study suggest that goals to improve acute postoperative pain management knowledge and attitudes must be established to assure quality patient care. Furthermore, nurses' commitment and accountability for pain management need to be expected and visible in the organization. Within clinical nursing practice, there are implications for the advancement of pain management practices at both the clinical and institutional levels of practice. In this section, I outline some of these implications and recommendations for addressing them.

Nurses will most likely change their pain management practices when they perceive themselves as needing to change particularly when an increased awareness creates a sense of readiness (Washburn, 2000). For example, all seven participants in this study gained an increased awareness of their pain management practices through the think-aloud technique and perceived themselves as needing to change
their pain management practices. Since beliefs, attitudes and preconceptions are barriers to effective pain management, interventions (and/or studies) need to be devised to modify nurses' beliefs, such as further clinical nursing research using the think-aloud technique as was done in this study.

I encouraged participants to reflect on their increased awareness by engaging in the process of reflexive journalizing (as I did) and consider ways to apply new knowledge in practice. Integration of new learning into practice requires time and this process can facilitate changing pain management practices to improve pain management outcomes. Institutional support is also required to change these practices.

There is an expectation in nursing that nurses will meet minimum professional standards of practice and be clinically competent. In today's climate of profound health care transition, nurse shortages, ongoing issues of education, recruitment and the need for improved learning opportunities for working nurses, strategic nursing leadership is paramount (Picard, 2000). Strategic nursing leadership is imperative to achieving these outcomes by employing participatory decision making approaches, engaging in meaningful dialogue, listening and developing strategies to create a shared vision on how to successfully accomplish nurses participating in continuing education (Dickson, 2000). There must be strategic leadership at the organizational, clinical and personal levels of decision making along with strategies in clinical practice to excel and advance practice and improve patient care. The following are suggestions to achieve this aim:

1. Share the findings of this research study with the staff of the institution, including the participants;

2. Teach nurses how to use a pain rating score so that they can then teach patients/families how to use it;

3. Further explore nurses' decision making and those factors influencing these decisions directly in relation to accessing physicians' standing prn orders;
4. Conduct an annual survey of staff nurses to determine their perceived educational needs in
relation to pain management and their requests for relevant educational topics;

5. Foster a shared vision and bring this vision to fruition by acting upon them and engaging
others in committing to these identified needs;

6. Prepare staff nurses to assume commitment and accountability for improved pain
management by creating a new role in clinical practice such as the *Pain Resource Nurse*
(PRN) in the context of the Pain Resource Nurse Program. The goal of this role is to
empower nurses in clinical practice to be accountable for the management of pain. The
PRN would be expected to be available on every unit and every shift to function as a
resource and role model for nursing assessment and intervention in pain management
(Ferrell et al., 1993);

7. Monitor the outcomes of the PRN program, including the IV PCA program, through on­
going program evaluation and continuous quality improvement initiatives;

8. Create innovative funding processes that will guide the allocation and distribution of funds
to support nurses attending continuing education in relation top pain management; and

9. Provide a supportive clinical environment, which encourages and rewards innovation and
improvements in pain management outcomes. This requires that supports for leadership
be built to support these new directions by having the administration and management
commitment. Leadership for pain management can not occur in isolation of
administration and management support.

Further data analysis indicates that acute postoperative pain management performance monitoring
at the organizational level is weak. For example, The Joint Commission of Accreditation of Healthcare
Organizations (1999) states, “performance monitoring and improvement are data driven. The stability of
important processes can provide the organization with information about its performance. Every organization must choose which processes and outcomes (and thus types of data) are important to monitor based on its mission and scope of care and services provided. The leaders prioritize data collection based on the organization’s mission, care and services provided, and populations served. When possible, data collection is incorporated into day-to-day activities rather than a separate activity” (p. 14-15). I know from my personal experience in the development and implementation of the IV PCA program that I have not expanded or transferred the generic pain management standards from the IV PCA program into the general patient population. This is an omission that requires immediate attention (i.e., the need to develop and implement generic acute postoperative pain management standards within this organization). The following suggestions relate to institutional pain management:

1. Build institutional commitment to improve pain management by developing a pain management committee that is responsible for the recognition, treatment, and documentation of pain. Typically, the pain committee is interdisciplinary and responsible for the systematic study of pain and the resultant improvements in pain management;

2. Adopt the APS, AHCPR and CAMH guidelines as a framework to institutionalize pain management. These pain management quality improvement guidelines would guide the pain committee to establish standards for pain assessment, treatment and documentation. Establishment of standards ensures that everyone involved in the care of patients with pain shares the same understanding of what constitutes pain assessment, treatment and documentation. "Standards help to assign accountability and guarantee that what is being measured is done so uniformly over time. Without standards, it is impossible for clinicians to know where to start or when the goal of pain relief has been achieved.
Standards provide a ‘measuring stick’ that can be used to demonstrate improvements” (McCaffery and Pasero, 1999, p. 730);

3. Use a monitoring tool to assess structures in place to support and enhance pain management; i.e., Institutional Assessment of Structures that Support Pain Relief (Angelucci, Quinn and Handlin, 1998);

4. Revise documentation standards to include a specific rule regarding the nature and frequency of required pain assessments; i.e., all nursing bedside forms should include adequate space to document pain intensity ratings near the vital signs to promote high visibility and accountability for all patients; not just the IV PCA patients. For example, establish pain as the fifth vital sign;

5. Conduct continuing pain surveys of knowledge and attitudes of interdisciplinary healthcare providers as the process itself promotes accountability and more optimal pain control (Lebovits et al., 1997);

6. Develop and implement continuing education policy and guidelines;

7. Conduct quality improvement initiatives for assessing the problem of pain management; for example, the “Nurses’ Knowledge and Attitudes Survey” developed by Ferrell and Leek (Ferrell, Grant, Ritchey, Ropchan and Rivera, 1993); and

8. Measure outcomes related to pain management utilizing IV PCA, such as length of hospital stay, patient satisfaction with care, and acceptable pain levels with tolerable opioid side effects.

Conclusion

The purpose of this qualitative study was to answer the question-How do expert nurses manage acute postoperative pain in the adult patient population using the modality of IV PCA in day-to-day
clinical practice?" The answer was surprising and a little disconcerting as it pointed to some extreme knowledge gaps in the area of pain management both generally and specific to IV PCA. Nursing has made great strides moving from traditional post-operative pain management modalities to the innovation of IV PCA; however, knowledge of the principles around pain management has not progressed at an equal pace. Implications of this research focus largely on the need for development and commitment to pain management standards care (both generic and IV PCA) and ongoing education around pain management. Further research is indicated to monitor and evaluate the outcomes of IV PCA. The participants indicated that a positive outcome of this research is the actual research process itself and the affect it has had on their clinical nursing practice.
REFERENCES


APPENDIX A: LETTER REQUESTING NOMINATION

UBC School of Nursing Letterhead

Dear ________________________________________,

The following is a request for nominations of participants in the research study "The Factors Influencing Expert Nurses' Decision Making Regarding Patients' Experiences of Acute Postoperative Pain and Its Management using the Modality of IV PCA in day-to-day Clinical Nursing Practice" conducted by Dr. Barbara Paterson, principle investigator and myself, Barbara McLeod, graduate student in the Master of Science in Nursing (MSN) program at the University of British Columbia. The findings in this study will be used to provide useful direction for furthering nursings’ knowledge and science in the management of acute postoperative pain using the modality of IV PCA and will assist nurses to develop teaching strategies and/or interventions in order to make expert clinical judgements in the management of PCA therapy. An effort will be made to determine why PCA is not always the effective pain management modality is expected and purported to be. The proposed research study is to meet partial fulfillment of the requirements for the degree of Master of Science in Nursing of Barbara McLeod, RN.

We are seeking seven (7) participants in this study, specifically; diploma or baccalaureate prepared registered nurses. We are asking you to nominate at least five "expert" nurses on the basis of your perception of her/him as an expert nurse in the management of acute postoperative pain using the modality of IV PCA. These participants should be nominated according to criteria that has been established as indicative of expert nursing practice inherent in a relevant literature review. The criteria to be used are:

♦ volunteers to participate in this research study;
♦ RN employed at Saint Mary's Hospital, New Westminster;
♦ diploma or baccalaureate prepared RN;
♦ employed on either a fulltime or part-time basis;
♦ female or male;
♦ provides direct postoperative patient care to adult patients on an acute surgical nursing unit (5th Floor Surgery at Saint Mary's Hospital);
♦ has completed the six-step, PCA certification process at Saint Mary's Hospital,
♦ is PCA certified;
♦ has been practicing IV PCA therapy in clinical practice for five-(5) years or longer (between 1992 and 2000); and
♦ has worked with over 100 patients receiving PCA therapy.
The study consists of collecting data by a technique known as "think aloud" during a one-month period. Participants will carry a voice-activated, pocket-sized tape recorder with them for four days in clinical practice during the research period to record their decision-making processes in day-to-day clinical nursing practice, not crisis practice. Audiotaped data will be transcribed verbatim. Barbara McLeod will analyze the raw data and participants in the study will validate interpretations of the data. A maximum of 36 hours of the participants’ time, primarily in actual clinical nursing practice during scheduled hours of work will be required if she or he decides to participate in this project.

If you are aware of an individual who meets the criteria of the study, please inform her/him about the study and ask if she/he would like additional information about the research. Barbara McLeod will contact you within one week of receiving this letter. You will be asked for the names and telephone numbers of individuals who have expressed an interest in the study. Barbara McLeod will contact each nominated individual by telephone to provide a description of the study, answer any questions, and invite participation. Each participant will be advised that participation is voluntary and that they may refuse to participate or withdraw from the study at any time without jeopardy to their employment.

A copy of the consent form and ethical approval is appended for your interest. If you have any questions or concerns about our request, please contact the principle investigator, Dr. Barbara Paterson at XXX-XXX-XXXX. You may also call Barbara McLeod at XXX-XXX-XXXX. If you leave a message, Dr. Paterson or Barbara McLeod will return your call. The researchers will attempt to answer any questions you may have.

Thank you for consideration of this request.

Sincerely,

Barbara McLeod, RN, BSN
Co-Investigator
Graduate Student
UBC School of Nursing
APPENDIX B: PARTICIPANT INFORMED CONSENT FORM

Title: Factors influencing expert nurses' decision making regarding patients' experiences of acute postoperative pain and its management using the modality of intravenous (IV) patient-controlled analgesia (PCA) in day-to-day clinical nursing practice

Principal Investigator: Barbara McLeod, UBC Graduate Nursing Student, Master of Science in Nursing (MSN) Program -Thesis

XXXXXXXXXXXXXXXX

XXXXXXXX

XXXXXX

Telephone XXX-XXX-XXXX

Masters Thesis Supervisor: Dr. Barbara Paterson

University of British Columbia

T201-2211 Wesbrook Mall, Vancouver, BC

Telephone XXX-XXX-XXXX
You are being invited to participate in a research study designed to explore and describe factors which influence nurses' decisions regarding patients' experiences of acute postoperative pain and its management using the modality of IV PCA in day-to-day clinical practice. Participation in the study will occur between February and April 2000. The study consists of an initial individual interview, tape recording your thoughts about clinical practice for four-eight hour shifts, and one 2-hour interview following the final tape recording session. A maximum of 35 hours of your time over the course of 3 months will be required if you decide to participate in this project.

Participation in the study is voluntary. You may withdraw from the study at any time or refuse permission for the use of your tapes or interview transcripts. You are being invited to participate in this research study because you have been nominated by the Patient Care Manager, Surgical Services or the Clinical Resource Nurse, Critical Care/Surgery as an “expert” nurse in PCA therapy.

You (1) are a diploma or baccalaureate prepared Registered Nurse; (2) are either a full-time or part-time employee at Saint Mary’s Hospital; (3) provide direct postoperative care to adult patients on an acute surgical nursing unit; (4) are female or male; (5) are PCA certified as an outcome of completing Saint Mary’s Hospital’s six-step certification process; (6) have been practicing IV PCA in clinical practice for three years or longer; and (7) have worked with over 100 patients receiving PCA therapy.

If you agree to take part in the study, Barbara McLeod will interview you. You will be asked some personal demographic data, to tell about your experiences managing acute postoperative pain using the modality of IV PCA in day-to-day clinical nursing practice and to respond to questions related to factors, which might influence your decisions. During this interview, the interviewer will give you a tape recorder and discuss the process for recording your thoughts in the periods of tape recording in the research study. Following the interview, you will be assigned four-eight hour shifts during the data collection time period of February – March 2000. In each of your scheduled shifts, you will be asked to carry a voice-activated, pocket-sized tape recorder to record your thinking and ideas during clinical practice. You will mail the tape in an addressed Xpress Post envelope to Barbara McLeod at the completion of the four, eight-hour shifts of decision recording. Following the tape recording sessions, Barbara McLeod will interview you regarding the decisions recorded. All interviews will be taped and transcribed. The transcriber will have access to the audiotapes, but your anonymity will be protected by identifying the audiotape by code number only.
Your name will not be used in the transcriptions of the tapes or interviews. Only a code number assigned to you will identify your tapes and interviews. Only the research team will have access to the tapes and transcriptions; the tapes and transcriptions will be stored in a locked filing cabinet to which only the principal investigator has a key. The tapes and transcriptions will be destroyed in ten years following the completion of the study. The tapes will be erased and the transcriptions will be incinerated. The findings in this research study will be reported in Barbara McLeod's Master of Science in Nursing thesis and they may be published in professional publications, in teaching materials and at professional conferences. Your name will not be associated with the study.

There are no known risks to the research. If you agree to participate, the possible benefits of the proposed research are: (1) an increased awareness of factors influencing nurses’ practice may be a helpful outcome of participation; (2) the opportunity to participate in and have a voice that accurately reflects nurses’ everyday PCA practice may be a stimulating and rewarding experience particularly, if the findings support perceived changes that may be required in PCA nursing practice; and (3) the opportunity to meet nurses’ continuing competence requirements mandated by legislation in BC. In addition, you will contribute information that may be beneficial to other nurses and to those who plan and teach PCA in clinical nursing practice. You will receive a written summary of the results of the research upon its completion. Before you sign this form, please ask any questions regarding aspects of the study, which remain unclear.

There is no monetary compensation associated with participating in this study. The tape recorders will be returned to Dr. Barbara Paterson at the completion of this study.

You have had an opportunity to have all your questions about the research study answered. Please ask any questions about parts of the study, which are not clear. If you agree to participate in the study, all the information you give will be kept confidential and your name will not be used in any presentations or reports given about the research. You may withdraw from the study at any time or refuse permission for the use of your statements in the tapes or transcripts.

You can contact myself, Barbara McLeod, or my thesis supervisor, Dr. Barbara Paterson, if you have any questions regarding the study. She or I will attempt to answer any questions you may have prior to, during, or following the study. If you have any questions or concerns about your treatment or rights as a research subject, you may contact Dr. Richard Spratley, Director of Research Services at the University of British Columbia, at XXX-XXXX.
Authorization

I, __________________________ R. N., have read and decide to participate in the research study described above. My signature indicates that I give permission for the information I provide in tapes or interviews to be used for publication in research articles; journals/books, and/or teaching materials. Additionally, my signature indicates that I have received a copy of the consent form.

________________________________________________________
Signature of Participant Date

________________________________________________________
Signature of Principal Investigator Date
APPENDIX C: DEMOGRAPHIC DATA

Study: Factors influencing expert nurses' decision making regarding patients' experiences of acute postoperative pain and its management using the modality of IV PCA in day-to-day clinical practice.

Principal Investigator: Barbara McLeod, UBC Graduate Nursing Student, Master of Science in Nursing (MSN) Program - Thesis.

Telephone: XXX-XXXX

Masters Thesis Supervisor: Dr. Barbara Paterson, Associate Professor

University of British Columbia School of Nursing

Telephone: XXX-XXXX

Code Number ______________ "Do not put your name on the questionnaire".

Please provide the following demographic information about your nursing experiences, by checking the appropriate response following the initial interview with Barbara McLeod. Please return the questionnaire to Barbara McLeod in the sealed envelope provided for you at the completion of the preliminary interview. Your identity will be kept confidential by the assignment of a code number only. Data reports will be based on aggregate data and will not include names or other identifying information of participants. You have the right to refuse to participate in completing this demographic data without jeopardizing your employment status. It is anticipated that this will require a maximum of 10 minutes of your time to complete. The benefit of completing this data is to clearly describe the sample population in this research study. If you chose to complete the demographic data, it will be assumed that consent has been given.
1. Your current age: _ 17-29; _ 30-39; _ 40-49; _ 50-65; _ >65
2. Your sex: _ Female; _ Male
3. Educational Background _ Diploma RN _ Baccalaureate RN
4. Employment status: _ Full-time; _ Part-time
5. Your total years of nursing experience (part-time or full-time):
   _ <1; _ 1-6; _ >6-12; _ >12-22; _ >22-32; _ >32
6. Your number of years of experience working on 5th Floor Surgery:
   _ <1; _ 1-6; _ >6-12; _ >12
7. In the past 5 years, have you participated in any lectures, workshops, or courses on pain or pain
   management besides your PCA certification? _ Yes; _ No
8. You received your PCA certification in:
9. You were PCA certified by: _ Barbara McLeod, CRN; Other: ________________
10. You have been PCA certified for how many years?
    _ 3 years; _ 4 years; _ 5 years; _ 6 years
11. You have cared for approximately how many patients receiving PCA therapy since PCA certified?
    _ >100; _ >200; _ >300; _ >400

THANK YOU FOR COMPLETING THIS
APPENDIX D: "THINK ALOUD" INTERVIEW GUIDE

Study: Factors influencing expert nurses' decision making regarding patients' experiences of acute postoperative pain and its management using the modality of IV PCA in day to day nursing practice.

1. Please tape record your thoughts regarding the following General Categories of Pain Management:
   - Perception of your role in acute postoperative pain management in the adult patient population using the modality of IV PCA, including pain assessment and intervention(s);
   - Your understanding of what a prn physician order is and what prn orders mean to you generally, and in the context of IV PCA;
   - What "patient control" in PCA therapy means to you, the nurse;
   - What "nurse control" in PCA therapy means to you, the nurse;
   - What PCA "patient selection" means to you, the nurse;
   - What your perception is of the role of the nurse in relation to documentation using the PCA Flowsheet;
   - What your perception is of the role of the nurse in relation to documentation using the standard of Focus Charting® to reflect the nurses' role in PCA therapy.
   - What your perception is in relation to your documentation practices; specifically, do you consistently meet your documentation Standards of Nursing Practice in the PCA program? Please describe your rationale.

2. Please record your thinking during decision making in pain management with your patients regarding the following Specifics of IV PCA Therapy:
   - PCA initiation
   - PCA monitoring
   - PCA weaning; i.e., opioid titration
   - PCA termination; i.e., discontinuing IV PCA therapy
   - PCA side effects including nursing assessment, intervention(s), and how you balance analgesic need with undesirable side effects

Page 1 of 2
3. Please provide the following **Details Regarding Decision Making:**

- Why the decision was made;
- The nature of the context (e.g., who was there, what was happening);
- The factors that affected the decision (e.g., empty PCA vial, uncontrolled pain, nausea, etc.);
- The choice of your action taken (e.g., increased PCA dose, decreased lockout, called anesthetist, gave antiemetic etc).

4. Please record your thoughts about your perception of being an "expert" nurse in IV PCA therapy on 5th Floor Surgery in day-to-day clinical nursing practice.