1993

A Survey of factors that influence the dose of analgesia administered to adult postoperative patients

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San Jose State University

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DOI: <https://doi.org/10.31979/etd.8rzt-nx2s>
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**A survey of factors that influence the dose of analgesia
administered to adult postoperative patients**

Brown, Caryl J., M.S.

San Jose State University, 1993

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A SURVEY OF FACTORS THAT INFLUENCE THE DOSE
OF ANALGESIA ADMINISTERED TO ADULT POSTOPERATIVE PATIENTS

A Thesis

Presented to

The Faculty of the Department of Nursing
San Jose State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

By

Caryl J. Brown

May, 1993

APPROVED FOR THE DEPARTMENT OF NURSING

Jean Sullivan Ed.D., R.N.

Jean Sullivan Ed.D., R.N.

Coleen Saylor Ph.D., R.N.

Coleen Saylor Ph.D., R.N.

Anne Norton M.S.N., R.N.

Anne Norton M.S.N., R.N.

APPROVED FOR THE UNIVERSITY

Serena H. Stanford

ABSTRACT

A SURVEY OF FACTORS THAT INFLUENCE THE DOSE OF ANALGESIA ADMINISTERED TO ADULT POSTOPERATIVE PATIENTS

by Caryl J. Brown

This thesis identifies factors that influenced nurses' decisions to administer postoperative analgesia to adult patients when a variable dose range was prescribed. Utilizing a descriptive survey design, data were collected from a sample of nurses ($N=35$) from a Bay Area hospital. Factors were analyzed for their relationship to the dose of postoperative analgesia administered.

Data indicated nurses were influenced by two physiological responses, six patient behavioral responses, the perceived need for facilitation of nursing care, and patients' ages when the dose of analgesia was administered. Of note was that 70% of the patients reported severe pain, yet 61% of those patients were medicated with the mid to low dose range, whereas 39% received the highest dose prescribed. There was no relationship between the dose of analgesia administered and the nurses' department or shift worked, highest level of education, or attendance at a pain management workshop. Further research is recommended.

ACKNOWLEDGEMENTS

This thesis would not have been possible without the scholarly advice, wisdom, patience and sense of humor of my first reader, Dr. Jean Sullivan; second reader, Dr. Coleen Saylor; third reader, mentor and colleague, Anne Norton; and Dr. Bethany Shifflett, for her assistance with statistical analyses.

My sincere appreciation and thanks to all the following friends, family and colleagues who helped me through the graduate process of research.

A special thanks to the nurses on 3rd floor of Good Samaritan Hospital who gave their valued time and opinions to the survey which contributed to this study...

To Marianne Nevins and Ann in the library for their prompt service locating articles for the lit review...

To my colleagues, who have been willing to work around my class schedule all these years while I achieved higher education...

To my typist, who was able to turn the draft into a finished product...

To my parents, who instilled the value of higher education...

To my daughters who put up with fast food while the kitchen table was covered with papers...

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Chapter 1

INTRODUCTION

Ancient civilization believed pain resulted from "the intrusion of the body by magical fluids, demons or objects" (Jaros, 1991, p. 1), such as arrows or swords. They believed that the demons would be released from the body through sneezing, vomiting, sweating, or urinating. The role and cause of pain has been a theme in history of human thought, religion, and medicine (Jaros, 1991). According to Doody, Smith, and Webb (1991), nearly 50 million Americans are disabled yearly by some type of pain which causes them to seek health care. Nurses spend more time with patients in pain than other health team members (McCaffery & Beebe, 1989), and are key to effective pain management (Donnovan, 1990).

In the past decade, many advances have occurred in the study and treatment of pain (Musgrave, 1990). Patients still report suffering because of inadequately treated pain (Christoph, 1991). Clinical studies showed that approximately 23.3 million operations performed in the United States in 1989 involved some form of postoperative pain management. Opioids ordered "as needed" failed to relieve pain in more than half of the postoperative patients (Agency for Health Care Policy and Research, 1992).

According to Franck (1991), nurses caring for critically ill newborns have difficulty responding to the neonates' pain because of lack of knowledge for the use of analgesia for this patient population and the inability to adequately assess neonates' pain. A large percentage of patients in critical care are over the age of 65. Problems with pain in this age group are variable due to physiological changes that occur with aging, lack of reporting pain, and social, physiological, behavioral, and cognitive abilities (Greenlee, 1991). Because of the physiological and psychological effects of pain, reduction of pain through the administration of analgesia requires the utmost attention of nurses (Puntillo, 1991).

Effective pain treatment is dependent upon accurate assessment of patients' pain experiences (Christoph, 1991). Pain has been a challenge for researchers to define because pain is an individual, subjective experience. A number of tools have been developed to determine the type, magnitude, and location of pain. Problems have arisen, however, with the development of instruments that are quantifiable, reliable, and valid (McGuire, 1988). A number of authors have described the influence that nurses' perceptions, attitudes, and personal biases may have on the assessment of patients' pain. Investigators have also found that nurses'

perception of pain was influenced by nurses' experience or cultural beliefs (Christoph, 1991).

Inadequate education and decision making regarding analgesics, personal experience, and professional bias all contribute to misuses of analgesics in the critical care setting (Franck, 1991). According to McCaffery and Beebe (1989), many health care professionals were taught little about pain relief, and they are often unaware of their lack of knowledge of pain control.

According to Pardue (1987), a key component of nursing practice is the nurse's ability to process information and make decisions. Making a decision involves sensing cues, interpreting cues, drawing a conclusion about the cues, and based on the conclusion, deciding what should be done (del Bueno, 1983). Research related to critical thinking ability has been done with nursing students more often than with practicing nurses (Pardue, 1987). Therefore, it is important to study the factors or characteristics that influence practicing nurses' decision making regarding the dose of analgesia administered. This study focused on factors that influenced the dose of analgesia administered by the nurse during the first 72 hours postoperatively.

The Problem and Research Question

Pain is difficult to assess because the patient is the only real expert who knows how the pain feels. Narcotics are often prescribed on the basis of weight in children; in adults, a variable dose range is often ordered "as needed" for pain. It is up to the nurse to assess the patients' signs and symptoms, self-report of pain, and the nurses' perceived need to facilitate nursing care when postoperative analgesia is administered. The Agency for Health Care Policy and Research reports patients are being inadequately treated for pain with "as needed" opioids. Research indicates that medical staff frequently overestimate or underestimate patient suffering; thus, bias and discrepancies cause inaccurate assessment of the real pain (Harrison, 1991). The pattern of treating post-surgical pain with the minimal amount of analgesia is prevalent in some surgical departments due to nurses' fears of patient addiction (Musgrave, 1990). Therefore, it is important to study factors that might influence the dose of postoperative analgesia administered when variable dose ranges of analgesia are prescribed.

Research Questions

1. What is the relationship between patient physiological responses and the dose of analgesia administered to a postoperative patient?

2. What is the relationship between patient behavioral responses to pain and the dose of analgesia administered to a postoperative patient?

3. What is the relationship between the nurses' perceived need to facilitate nursing care and the dose of analgesia administered to a patient?

4. To what extent do nurses report that patient characteristics e.g., age, gender, or ethnic origin, influence the dose of analgesia administered to the patient?

5. What is the relationship between the patient self-report of pain and the dose of analgesia administered to a postoperative patient?

6. What is the relationship between nurse demographic data and the dose of analgesia administered to a postoperative patient?

Purpose and Need

The purpose of this study is to survey nurses to estimate if a relationship exists between selected factors and the dose of postoperative analgesia administered. Pain is frequently undertreated, and patients suffer (Christoph, 1991). Studies have been done that indicate nurses are influenced by patients' behavior, age, vital signs, and lifestyles (McCaffery & Ferrell, 1991a, 1991b; McCaffery & Ferrell, 1992; McCaffery, Ferrell & O'Neil-Page, 1992). "Physicians, nurses, patients, and families have common

misconceptions and fears concerning addiction, physical dependence, tolerance, and side effects of opioid analgesics" (McCaffery, Ferrell, & Ritchey, 1992, p. 16). Therefore, there is a fear of giving the patient too much medication.

According to McCaffery and Beebe (1989), the science of pain has practical implications for professional education. It takes time for acceptance of a new science, as well as time to disseminate and incorporate a new body of knowledge into basic education. Studies of pain management and critical thinking skills of nurses are all prevalent in literature, yet patients are still reporting that their pain is not relieved. Further research needs to analyze what it is that influences the nurses' decision making in the treatment of pain that fails to meet the patient needs.

Definition of Terms

Definitions of terms as they apply to this study:

1. Nurses are individuals licensed by the state to practice nursing. In this study, nurses refer to Registered Nurses and Licensed Vocational Nurses.

2. Postoperative period is the first 72 hours post surgical intervention when nurses directly observe patients' respiratory function, circulatory function, and alleviation of pain.

3. Pain results from tissue injury of pain receptor nerve endings that cause the release of substances that trigger an inflammatory response and result in an unpleasant feeling (Wild, 1990). "Pain is always subjective" (American Pain Society, 1992, p. 1). "Pain is whatever the patient says it is and it exists whenever the patient says it does" (McCaffery & Beebe, 1989, p. 7).

4. Decision making is a three step process in which one searches, analyzes, and chooses to solve a problem (Bailey & Claus, 1975, p. 7).

5. Factor is a "characteristic used to classify observations into different groups" (Shott, 1990, p. 340).

6. Analgesics are narcotics (opioids), and non-narcotics (non-opioids) that provide pain relief.

7. Dose range analgesia is an order written that allows a variable dose of narcotic to be given at a variable interval, e.g., Demerol 50-100mg q 3-4 hours PRN.

8. Postoperative patient is an adult, age 18 and older, who has undergone a surgical procedure within the past 72 hours.

Research Design

This was a prospective, descriptive study which utilized survey methodology to analyze the relationship between 15 factors and the dose of analgesia administered to a patient during the first 72 hours, postoperatively. The

survey instrument used in this study was designed by the researcher and is a modification of one developed and used by Gamberg (1977) in her study entitled An Investigation of Factors That Influence Nurses' Decisions To Administer Postoperative Analgesics. The instrument (Appendix A) was a checklist-type survey using Likert scale responses or fill in the blank responses. A group of nurses employed at a local Bay Area hospital was surveyed individually after each had administered analgesia to a postoperative patient. The nurses received instruction on the nature of research, and were invited to participate in the study. Informed consent was obtained from each subject (Appendix B).

Based upon literature review, factors that influenced nurses' decisions to administer variable dose range analgesia were selected. A variable dose range is defined as one that gives the nurse a prescribed variable range of analgesia to be given over a variable time frame, e.g., Demerol 50-100mg q 3-4 hours PRN. In this example, the nurse could give a low dose, 50mg, a mid range dose, 75mg, or a high dose, 100mg. The nurse could also decide whether to administer the analgesia in 3 hours, or 4 hours "as needed" for pain relief.

The survey questionnaire was developed to include the following factors:

1. Patient physiological responses, e.g., (a) elevated blood pressure, (b) rapid pulse, (c) rapid respirations, (d) perspiration, (e) normal blood pressure, pulse and respirations.

2. Patient behavioral responses, e.g., (a) crying, (b) moaning, (c) rubbing of a painful body part, (d) pointing to painful body part, (e) increased muscle tension, (f) facial expression (grimacing).

3. Nurses' perceived need for facilitation of nursing care, e.g., (a) repositioning the patient in bed, (b) cough and deep breathing, (c) ambulation, (d) dressing changes.

4. Patient characteristics, e.g., (a) age, (b) gender, (c) ethnic origin.

5. The dose of analgesia actually administered by the nurse e.g., (a) the lowest dose range, (b) mid dose range, (c) highest dose range, (d) dose prescribed did not give the choice of a variable dose range, (e) a bolus dose order on a Patient Controlled Analgesia pump.

6. The patient self-report of pain on a 1-10 scale as recorded by the RN.

7. Nurse demographic data, e.g., (a) gender, (b) department worked, (c) number of years in nursing practice, (d) number of years experience in current area of practice, (e) attendance in pain management workshop prior to this

study, (f) shift worked, (g) highest level of education, (h) ethnicity.

Content validity of the survey instrument was established by four expert clinicians/educators. Data analysis procedures used a chi square test of association to analyze independence of variables and a Cramer's V as an index of the relationship between the dose of analgesia administered and selected factors. Descriptive statistics were used to summarize the data.

Scope and Limitations

The purpose of clinical research is to generate knowledge about clinical practice and add to the body of nursing knowledge (Burns & Grove, 1987). The scope of this study is to describe factors or characteristics of the patient and the nurse that affected the dose of analgesia administered to a postoperative patient.

The number of patients scheduled for surgery was an unpredictable variable that could have affected data collection for the study. Nurses' schedules varied according to patient census; thus three departments were utilized to compensate for a potentially low census in any one department, thus assuring that an ample number of surveys were obtained. It was also assumed that nurses would want to participate in the study and that they would be honest in their responses.

This researcher had observed in clinical practice that nurses varied in their decision to administer postoperative analgesia to patients. A literature search indicated that patients' pain was not relieved despite advances in modern technology. This occurrence piqued the researcher's interest to look more in depth at studies done to find out why patients were still undertreated for pain. An in-depth literature search follows in Chapter 2.

Chapter 2

CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURE

This chapter will discuss theories and conceptual frameworks of decision making and pain control. The gate control theory and interactive model of pain, as well as related literature involving factors that influence the dose of postoperative analgesia administered, will be discussed.

Conceptual Frameworks and Theories

Nurses use theory in the form of concepts, principles, and processes to sharpen observations and as a basis for determining nursing actions to be taken (ANA, 1980). Decision making is an important aspect of the nursing process (Grier, 1976). Different theories and frameworks will be contrasted.

According to Grier (1976), decision theory is the process of selecting a nursing action and is begun with an inference about a patient need. There are four components to a decision situation: "(a) a set of actions, (b) outcomes associated with those actions, (c) probability of each outcome if action is taken, and (d) the value of the outcome to the decision maker" (Grier, 1976, p. 105). This type of theoretical framework uses a mathematical approach to decision making.

In contrast, Bailey and Claus (1975) view decision making as a "three step sequence: search, analyze, and

choose. These three steps are a central block of activities within the problem-solving process" (p. 7).

Nursing decisions are based upon values which are "learned through observation of others and through personal experience within a social context" (Trygstad-Durland, & Nelms, 1979, p.11). Values change, both personal and institutional, as new experience is gained. "Knowledge, skill, past experiences, and situational characteristics influence the information one gathers, and the interpretation one makes of the data" (Ford et al., 1979, p. 63).

According to Tanner (1987), theories of decision making can be divided into two groups: decision making from a rationalist perspective and from phenomenological perspective. The rationalist perspective is based upon the analysis of an action followed by rational and logical procedures and the clinician making knowledge and judgment explicit. In the phenomenological perspective, there is evidence that with increasing expertise, there is movement away from use of abstract principles and away from formal or rational approaches to decision making to the use of practical knowledge in holistic or intuitive judgments (Tanner, 1987). Benner (1984) maintains that "not all of the knowledge embedded in expertise can be captured in theoretical propositions, or with analytic strategies that

depend on identifying all the elements that go into decisions" (p. 4). Many expert nurses acknowledge the role of the "gut feeling," or intuition, as a rationale for action. Harbison (1991) cites that nurses who make decisions on an instinctive reaction are criticized for having no rationale for action. Literature infers that intuition is a legitimate part of the nursing process, the nursing practice, decision making, and problem solving, and is essential in education to develop perceptual abilities (Benner, 1984; Miller & Rew, 1989; Rew, 1990; Rew & Barrow, 1989; Umiker, 1989). The application of rational and phenomenological decision making approaches are valuable to the understanding of factors that influence nurses in the appropriate assessment and management of pain today.

Orlando's approach to the nursing process has "three basic elements: (a) the behavior of the patient, (b) the reaction of the nurse, (c) the nursing actions which are designated for the patient's benefit" (Marriner-Tomey, 1989, p. 230). These basic elements fit well with nurses' approach to decision making in regards to administering analgesia. The patient is assessed for physiological and behavioral responses to pain. The nurse responds to patients' needs for pain relief by giving the dose of analgesia that is believed will relieve the pain. Orlando's

nursing process theory is the basis for this researcher's approach to decision making for this study.

Gate Control Theory

No single pain theory adequately explains all that is known about pain production, transmission, perception, and pain behavior. According to Donovan (1990), "the gate control theory proposed by Melzack and Wall in 1965 is the best attempt to integrate the physiological, pathophysiological, and cognitive-emotional interactions of the pain experience" (p. 852). According to Melzack and Wall (1982), the gate control theory can be explained as a neural mechanism in the dorsal horn of the spinal cord that acts like a gate which can increase or decrease the flow of impulses from peripheral nerve fibers to the central nervous system. The degree to which the gate increases or decreases sensory transmission is determined by the activity in large A-beta fibers and small A-delta and C fibers and by descending influences from the brain (p. 222). Peripheral neurons become excited by stimuli, e.g., heat, injury, or ischemia. Chemical mediators respond to neurons causing the impulse to travel centrally and locally (Donnovan, 1991). Pain results from stimulation of small diameter A-delta and C nerve fibers that terminate in the substantia gelatinosa in the dorsal horn of the spinal cord. "When sensory stimulation reaches a critical level, a so-called gate in

the substantia gelatinosa opens allowing nearby T (transmitter) cells to project the pain message to the brain" (Nichols, 1987, p. 146). Once opioid analgesia diffuses into the dorsal horn, it binds with opioid receptors, closing the gate, and prevents the transmission of the pain to the brain (Slack & Faut-Callahan, 1991). It is important that nurses comprehend the gate control theory for a better understanding of the mechanism of pain so that adequate pain management is accomplished.

Models of Pain

Donnovan (1990) refers to two models of pain that pictorially describe the pain experience. The first model, the Loeser Model, is made up of four circles. The inner core of the circle represents nociception, the process of pain transmission impulses in the midbrain, pons, and medulla. The second part of the circle represents the pain experience as it travels down the ascending and descending tracts to produce the pain experience. The third circle, suffering, represents cortical activity that involves memory, emotion, spatial identification, and meaning. The outer circle is pain behavior, both verbal and nonverbal. The first three layers, or circles, are only experienced by the person, while the outside circle can be observed by the clinician and quantified by the person's verbal description (Donnovan, 1990).

The second model Donovan describes is the Interactive Model. It is also a circular model representing the pain experience. It too, has its inner core of nociception, the pain impulse in the brain which travels to the second layer of the circle, pain experience. In this model, the third circle is the pain behavior and the outer circle is system response. Social systems influence how pain is interpreted and expressed and what is done, or not done, to relieve pain (Donnovan, 1990). It is the outer circle, system response, that has been overlooked in health care and has resulted in inadequate assessment and treatment of pain.

The Gate Control Theory provides a physiological explanation of the mechanism for pain, while the Loeser Model and the Interactive Model of Pain provide a pictorial translation of the pain experience. It is important to appreciate the relevance of the pain theory and pain models to effectively assess and manage pain.

Related Literature to Pain

According to McCaffery and Beebe (1989), pain is a universal human experience and the most frequent reason that people seek health care. "Pain control must be recognized as a priority; however, historically, it has not been the case" (p. 1).

Deficiencies continue in the clinical management of pain, including undermedication of patients, especially

children with acute pain, and those with prolonged pain due to malignancy, overmedication of people with chronic nonmalignant pain, and inadequate communication between professionals and patients. (McCaffery & Beebe, 1989, p. 3)

Pain may be referred to as acute or chronic pain.

Acute pain refers to pain of sudden onset resulting from actual or impending tissue damage or injury due to disease (Christoph, 1991). Chronic pain is referred to as pain that has existed six months or more (Christoph, 1991). Nurses need to be aware of patients' history because the patient may suffer from chronic pain as well as an acute episode of pain. This study will focus on acute pain following surgery.

There are two concepts related to the subjectivity of individual patient pain response. Threshold refers to the lowest point at which pain is first experienced. Tolerance is a point at which the pain is so intense it cannot be tolerated (McGuire, 1988).

"Pain is a complex, subjective response with several quantifiable features, including intensity, time course, quality, impact, and personal meaning" (Agency for Health Care Policy & Research, 1992, p. 7). Three common self-report assessment tools for rating the intensity of pain in adults are as follows:

1. A numerical rating scale is presented verbally with 1 being the lowest intensity of pain and 10 being the greatest intensity of pain experience.

2. A visual analog is presented graphically with a 10 cm horizontal baseline with endpoints of zero for no pain and 10 for unbearable pain. The patient places a mark on the line or points to the line that best represents his/her pain.

3. An adjective rating scale uses descriptive words on a 10 cm line and the patient chooses the word that best describes the intensity of pain (Agency for Health Care Policy & Research, 1992, p. 12).

When selecting a tool to evaluate pain, the nurse should select a tool that the patient can relate to or understand. Bias and inaccurate assessments of pain can result from the use of poorly devised pain assessment tools (Harrison, 1991). Not all cultures are accustomed to reading from left to right so presenting them with a visual horizontal scale that measures pain from left to right may not be a meaningful measurement of pain. However, a vertical scale with no pain at the bottom, (zero), and unbearable pain at the top, (10), may be a better way for the patient to express pain measurement.

Health care workers develop conclusions of expected responses to painful stimuli which may or may not be accurate for that individual (McCaffery, Ferrell, & Ritchey, 1992). These conclusions may be based on the clinicians' own personal values or personal experiences. Inaccurate assessments may also occur with patients who lack the vocabulary or the cognitive ability to express pain (Harrison, 1991). Quality of pain may be the most difficult for patients to describe because the "language of pain" varies from person to person (Christoph, 1991).

Physician and nurse education often does not equip the learner with sufficient knowledge about the causes of pain, drug options, pharmacokinetics, and methods of pain assessment for them to become proficient at selecting optimal dosage levels (Harrison, 1991). Physicians write their routine orders for all patients and the nurses follow the routine; however, the routine order is often not relieving patients' pain. Therefore, documented research related to pain and factors that influence the decision making need to be stressed to change standards of practice.

Another clinician concern is the risk of respiratory depression and fear of addiction with the use of narcotics (Slack & Faut-Callahan, 1991). Education is often based upon dangerous side effects rather than benefits for pain control (Musgrave, 1990).

According to Christoph (1991), pain is a physiological and psychological experience, which is influenced by emotional and socioeconomic factors. Development of an effective treatment plan is dependent upon accurate assessment of the patients' pain experience, which may be difficult to assess because of residual effects of anesthesia, altered levels of consciousness, and altered ability to communicate due to constraints from mechanical devices such as airways and nasogastric tubes, etc. Pain is difficult to assess because the patient is the only real expert on how his/her pain feels.

Physiological indicators of pain result from autonomic stimulation from sympathetic responses which include pallor, increase in blood pressure, pulse and respirations, increased muscle tension, and dilated pupils. In addition, the parasympathetic nervous system that innervates the colon, rectum, and bladder may elicit pain responses, e.g., nausea, decreased heart rate, and decreased blood pressure (Christoph, 1991).

Behavioral cues, e.g., excitement, irritability, anger, hostility, depression, unusual quietness, withdrawal, clenched teeth, loss of appetite, purposeful movements, such as rocking or rubbing a part may suggest that the patient is in pain. In addition, smiling and laughter, frowning, grimacing, splinting the operative site, distorted posture,

impaired mobility, insomnia, anxiety, and attention seeking all may be signs of pain (Agency for Health Care Policy & Research, 1992; Christoph, 1991; McCaffery, 1989). There are few reliable indicators of analgesic requirements for pain relief. Narcotics are often prescribed based upon weight. Children and elderly are often undermedicated because it is assumed "they tolerate pain better" (Christoph, 1991, p. 15).

According to Musgrave (1990), factors that influence the incidence of postoperative pain are type of surgery, types of anesthesia, personality traits, age, sex, and weight. Elderly patients may require smaller doses of analgesia due to slower metabolic rates, changes in aging nervous systems, and decreased cardiac output states (Musgrave, 1990). According to Greenlee (1991), elderly patients tend to be more stoic or cautious in characterizing pain possibly due to fear of the treatment or refusal to "give in." They sometimes will not complain of pain because they believe they are supposed to have pain. Women may express higher pain scores than men, but the difference may be the cultural norm that it is less acceptable for men to express pain than women (Musgrave, 1990).

Routine postoperative orders include frequent repositioning, coughing and deep breathing the patient, and early ambulation. These aspects of care help to facilitate

elimination of anesthetics to prevent atelectasis, promote peristalsis, and prevent circulatory complications (Brunner & Suddarth, 1986, pp. 88-93).

Pain is a very complex symptom to recognize, describe, and treat, since literature states that pain is undertreated. It is important to look at studies that have been done and to address those factors that need further research to speak to the problem of inadequate postoperative pain management.

Related Research Studies to Pain/Decision Making

Gamberg (1977) investigated 11 factors that influenced nurses' decisions to administer postoperative analgesics: (a) physiologic manifestations of pain, e.g., increased blood pressure and pulse, palmar sweating, increased depth of respiration, (b) vocal behaviors, e.g., crying, yelling, (c) age, (d) verbal statements, (e) socioeconomic background, (f) body movement, (g) sex, (h) cultural or ethnic background, (i) facial expressions, (j) facilitation of nursing care, e.g., ambulation, coughing and deep breathing exercises, dressing changes, sleeping and eating, (k) postoperative diagnosis (p. 10). Gamberg found differences in the ranking of factors depending on the shift worked. All shifts ranked patients' verbal statements of pain as the first factor influencing their decision to medicate a patient for pain. Day shift ranked body movement

second and postoperative diagnosis third, while the evening shift ranked postoperative diagnosis second and facial expression third. The night shift ranked physiologic manifestations of pain and postoperative diagnosis second and third, respectively. Gamberg (1977) found that "contrary to literature, facilitation of nursing care, cultural or ethnic background, age, sex, and socioeconomic background did not influence nurses' decisions to administer postoperative analgesic" (p. 46).

McCaffery and Ferrell (1991a) surveyed 456 nurses in six different cities in the United States to determine: (a) if patients' behavior influenced nurses when they recorded patients' self-report of pain, (b) if the doctor's order allowed a higher dose of medication, would patients' behaviors influence nurses' decisions to administer a higher dose? Results showed that nurses were influenced more by patients' behavior than self-report of pain when administering analgesia, so the maximum dose was not given. "One main reason for inappropriate use of analgesic drugs to treat postoperative pain is the inordinate fear of their side effects....A large body of literature indicates that addiction is seldom a problem when narcotics are used appropriately" (Musgrave, 1990, p. 332).

McCaffery and Ferrell (1991b) surveyed 359 nurses in four cities in the United States and one city in Canada to

determine if nurses were influenced by a patient's age when recording patients' self-report of pain and whether patient age influenced the higher dose of analgesia that was administered. Results showed that nurses were influenced by patients' age when assessing pain and chose not to administer the higher dose.

McCaffery and Ferrell (1992) surveyed 166 nurses in five cities in the United States to explore the effect of vital signs on nurses' decisions regarding pain assessment and analgesic choices. Results found that nurses were less willing to accept patients' report of moderate to severe pain with low to normal vital signs and tended to rely on vital signs more than patient self-report of pain.

Pardue (1987) investigated differences in critical thinking abilities and decision making abilities among associate degree, diploma, baccalaureate, and master's level nurses. Decision making skills were measured related to (a) frequency in making decisions, (b) difficulty in making decisions, and (c) factors which influence decision making. No differences were found in the four groups related to the three dimensions of decision making skills. Experience and knowledge were the most influential factors. Nurses with master's and baccalaureate degrees had the highest critical thinking ability.

This study investigated the relationship between the dose of analgesia administered and the highest level of education, department and shift worked, and prior attendance at a pain workshop.

Summary

Decision making theories, pain theories, pain categories, concepts of pain, and multiple assessment factors are cited throughout literature, yet patients are undermedicated and suffer from pain. Research into factors that influence pain management needs to continue. It is imperative that research findings be emphasized in educational programs, as well as in the practicing clinical arena, to affect change in standards of practice.

Chapter 3

THE METHOD

Research Design

This study was done to explore factors that influenced nurses' decisions to give pain medication to postoperative patients when the order allowed a variation in the dose that was to be given. This was a prospective, descriptive survey designed by the researcher to analyze the relationship between 15 selected patient factors and the dose of analgesia administered to patients during the first 72 hours postoperatively. Survey methodology was employed to gather many responses efficiently.

Setting and Sample

The investigation took place in a non-profit community 400 bed Bay Area hospital. Three departments were selected because of their average daily postoperative patient population. The sample was a convenience sample based on the average number of nurses scheduled to work for the average daily patient census. The departments targeted were (a) a 35 bed surgical unit with 27 registered nurses, (b) a 35 bed orthopedic-neuro unit with 24 registered nurses and one licensed vocational nurse, (c) a 44 bed cardiovascular-cardiopulmonary (CPC) telemetry unit with 47 registered nurses and 10 licensed vocational nurses. Only the 20 bed division of the cardiovascular side admitted postoperative

patients so only the staff scheduled to work on that side took part in the survey.

The survey was completed on an adult population that could state their level of pain. Intubated patients and children were excluded.

Data Collection Procedures

Permission to conduct the survey was obtained from the hospital Vice President of Patient Care and the Medical Staff Director. Permission was also granted by the Human Subjects-Institutional Review Board of San Jose State University. Copies of authorization are attached in Appendix C.

One week prior to the study, colorful posters were delivered to the participating departments inviting all nurses to join the research project. The Department Manager on the CPC unit volunteered to present the project in her staff meetings a week prior to the beginning of data collection. The Department Managers of the other two departments requested that the researcher introduce the project at change of shift during report. A brief explanation of the purpose of the study was given and the researcher was introduced as a graduate student at San Jose State University. The procedure for completing the informed consent and survey was explained. It was stressed that information obtained from the survey was confidential,

participation was voluntary, and the subject could decide not to participate at any time. Surveys were numbered sequentially to assure anonymity. Numbers were only significant to the researcher to identify data during computer analysis.

Surveys with envelopes, informed consents, and instruction sheets were delivered to the departments and placed in a designated place where all nurses could obtain the forms. Separate envelopes were provided to return the completed surveys and completed consents to insure anonymity. Completed surveys were collected by the researcher on a daily basis. Data collection began December 7, 1992, and was extended through January 22, 1993, in order to obtain an ample sample. Completed surveys were destroyed at the completion of the project.

There was no immediate benefit to the subjects for participation in the study except the opportunity to have contributed to clinical research. Results of the study were made available to participants after the completion of the thesis. Flyers were sent out to the departments, and a class was set up through the Human Resources Department to disclose the results of the study. Appreciation for subject participation was acknowledged in the researcher's thesis as well as a written thank you letter to each department at the close of the data collection.

There were no known risks to the subjects for participating in the research study, nor was compensation awarded. Subject names were not identified; only demographic data was collected. Copies of the data collection form (Appendix A) and human subjects informed consent (Appendix B) are attached.

Instrument

The instrument was developed by the researcher and was influenced by the study done by Gamberg in 1977. The survey was reviewed by four master's prepared expert nurses for clarity, ease of reading, and the appropriateness of the selected variables as they related to the proposed research questions. The questions asked nurses to indicate if the 15 factors influenced their decision to medicate the patient for pain and if patient age, gender, and ethnicity had influenced the dose of analgesia administered. The survey requested Likert scale responses indicating strongly disagree, disagree, agree, strongly agree, or did not apply to the patient. Fifteen factors addressed patients' physiological and behavioral manifestations, age, gender, ethnicity, and the nurses' perceived need for facilitation of nursing care. Nurses were asked to indicate the dose of analgesia given to the patient by placing a check mark next to one of five possible choices. The patients' verbal statement of pain was recorded on a 1-10 scale. The

following nurse demographic data were collected: gender, department and shift worked, number of years in nursing practice, level of education, ethnicity, and prior attendance at a pain management workshop.

Analysis of Data

Research questions for patient physiological and behavioral responses, patient self-report of pain, perceived need for facilitation of nursing care, and demographic data were analyzed for the relationship to the dose of analgesia administered. The chi square test of association and the Cramer's V value were used as an index of the relationship to analyze the extent to which the independent variables were related to the dose of analgesia administered to the patient. Descriptive statistics, including frequency distribution and percentages, were used to summarize the data. The alpha for the study was .003 (.05 divided by 15). This was done to control for the error rate due to the multiple chi square analyses being conducted. Chi square test of association was done to test the independence of variables, but assumptions failed when expected frequencies exceeded 20% of cells with less than 5 in each cell.

Cramer's V values were reported to measure the strength of relationship between categorical variables. Cramer's V values were reported as weak if values were below .2, moderately strong if .4-.6, and strong if greater than .7.

The study was limited by design, sample, and data collection in the following ways:

1. The collection of data was limited on the cardiovascular telemetry department by the postoperative time frame of 72 hours because some patients were not transferred to the unit from the Intensive Care Unit until after 72 hours postoperatively.
2. The time of year influenced the data collection due to the decrease in scheduled surgeries during the Christmas holidays, which required fewer nursing staff to care for a lower patient census.
3. The method of dispersing the information about the study did not reach all nurses because all were not present for the initial presentations of the project.
4. The study was limited because the sample was small. Results were reflective of opinions of those nurses who responded; therefore, the opinions of the sample may not have been representative of nurses at large.

Chapter 4

ANALYSIS AND INTERPRETATION OF DATA

Introduction

This study used a descriptive survey design to explore factors that influenced nurses' decisions to administer postoperative analgesia prescribed in a variable dose range for the adult patient. The sample of 35 nurses was a convenience sample taken from three nursing units at a private Bay Area hospital in Northern California. The data collection instrument was a 26 item questionnaire that used Likert scale responses and open-ended questions.

Sample

There were 94% female and 6% male nurses (Table 1). There were 94% registered nurses and 6% licensed vocational nurses, 17% with a diploma in nursing, 29% with an associate of arts in nursing, and 48% with a bachelor of science in nursing. Years in nursing practice varied from 1 year to 35 years, 30% with 1-5 years, 29% with 6-10 years, and 30% greater than 10 years. The sample was obtained from a general surgical unit, 34%; an orthopedic-neuro unit, 37%; and a cardiovascular-cardiopulmonary unit, 29%. Nurses were surveyed from three shifts, with 37% on day and evening shifts and 26% from the night shift. Forty-nine percent had attended a pain workshop, and ethnicity was 63% white.

Table 1

Sample Characteristics (N = 35)

	<u>n</u>	<u>%</u>
<u>Gender</u>	33	94
Female	2	6
Male		
<u>Department Worked</u>	12	34
Surgical	13	37
Orthopedic-Neuro	10	29
Cardiovascular-Cardiopulmonary		
<u>Total Years in Nursing Practice</u>	13	38
1 - 5 years	10	29
6 - 10 years	11	30
11 - 35 years	1	3
Missing data		
<u>Attended Pain Workshop</u>	18	51
No	17	49
Yes		
<u>Shift Worked</u>	13	37
Days	13	37
Evenings	9	26
Nights		
<u>Highest Level of Education</u>	2	6
Licensed Vocational Nurse	6	17
Diploma	10	29
Associate Arts	17	48
Bachelor Science Nursing		
<u>Nurse Ethnicity</u>	1	3
American Indian	3	9
Asian	6	18
Filipino	22	63
White	2	6
Other	1	3
Missing		

Note: Percentages may add to more than 100% due to rounding.

Data Analysis

Data analysis was done by the researcher at San Jose State University using the Statistical Program of Social Sciences (SPSS). Frequency distribution and percentages were obtained from survey responses. Respondents were asked to record the total number of years in nursing practice and to record the number of years' experience in the current area of practice. Frequency distribution and percentages, of both areas, were nearly the same. Collapsed data is recorded in Table 1 under total years in nursing practice.

Patient self-report of pain was recorded on a 1-10 scale. Data were then collapsed into three categories of mild, moderate, and severe pain. Chi square test of association was done to test the independence of variables, but assumptions failed when expected frequencies exceeded 20% of the cells with less than 5 in each cell. Cramer's V values were reported to measure the strength of relationship between independent variables and the dose of analgesia administered.

A Likert scale was used for responses to the survey for: physiological factors (items 1-5), behavioral factors (items 6-11), the perceived need for facilitation of nursing care (item 12), and patient characteristics (items 13-15). There were five scale responses: strongly disagree, disagree, agree, strongly agree, and did not apply to this

patient. Data were collapsed for statistical purposes to agree or disagree. The response did not apply to patient was recorded as missing data because it was felt that the dose of analgesia administered was not influenced by the reply. The instrument may be found in Appendix A.

Item 26 was an open-ended question that gave the respondent the opportunity to write any additional factors not addressed in the survey that influenced the dose of analgesia administered. Responses to this item are listed at the end of the data analysis chapter.

Research Questions

Patient Physiological Response

The first research questions was: What is the relationship between the patient physiological response and the dose of analgesia administered to the postoperative patient? To answer this question, frequencies and percentages of responses to survey items 1-5 are discussed (Table 2).

The first five items were patient physiological responses and were based upon the following statement: I gave my patient pain medication because he/she: had an elevated blood pressure (item 1), had a rapid pulse (item 2), had rapid respirations (item 3), the patient was perspiring (item 4), had normal blood pressure, pulse and respiration (item 5).

Table 2

Physiological Patient Responses and Dose of Analgesia
Administered (N=35)

Variable	Dose Range of Analgesia			Cramer's V	Missing Data n
	<u>Low</u> <u>Dose</u> <u>n</u>	<u>Mid</u> <u>Dose</u> <u>n</u>	<u>High</u> <u>Dose</u> <u>n</u>		
Elevated blood pressure				.12	14
Agree	2	6	4		
Disagree	1	4	4		
Rapid pulse				.07	16
Agree	1	2	2		
Disagree	2	6	6		
Rapid Respirations				.09	17
Agree	1	3	2		
Disagree	2	5	5		
Perspiring				.34	18
Agree	0	0	1		
Disagree	3	8	5		
Normal Vital Signs				.57	16
Agree	1	4	5		
Disagree	2	7	0		

Patient had an elevated blood pressure (BP) had 21 subject responses to which 43% (n=9) disagreed and 57% (n=12) agreed. Of those subjects who did not agree that the patient's elevated BP influenced the dose, 4 gave the mid dose, and 4 gave the high dose. Of those who agreed that

their patient's elevated BP influenced the dose, 17% ($n=2$) recorded having given the lowest dose, while 50% ($n=6$) gave the mid dose, and 33% ($n=4$) gave the highest dose. There were 14 missing data indicating that patients did not have an elevated BP. The Cramer's V value of .12 demonstrated a weak relationship between elevated BP and the dose of analgesia administered. Of those who responded, 48% of the nurses gave the mid dose, while 38% gave the highest dose, and 14% gave the lowest dose of analgesia.

The variable, patient had a rapid pulse, had 19 responses with 74% ($n=14$) disagreeing and 26% ($n=5$) agreeing that the dose given was based upon patients' rapid pulse rate. While the majority disagreed that they were influenced by rapid pulse, 6 recorded having given the mid dose, and 6 the high dose. Of those who agreed, 2 gave the mid dose and 2 gave the high dose. There were 16 missing data indicating that patients did not have a rapid pulse. The Cramer's V value of .07 demonstrated a very weak relationship between rapid pulse and the dose of analgesia administered. Of those nurses who responded, 42% gave the mid dose, 42% the highest dose, and 16% the lowest dose of analgesia.

There were 18 nurses who responded to: patient had rapid respiration, to which 67% ($n=12$) disagreed and 33% ($n=6$) agreed. Of the 12 nurses who disagreed that the dose

administered was influenced by patients' rapid respirations, 10 recorded having given the mid to highest dose, whereas of the 6 who agreed, half gave the mid range, 2 gave the high range, and 1 gave the lowest dose. There were 17 missing data indicating patients did not exhibit rapid respirations. The Cramer's V value of .09 demonstrated a very weak relationship between the patient with rapid respirations and the dose of analgesia administered. Of those nurses who responded, 44% gave the mid dose, 39% the highest dose, and 17% the lowest dose of analgesia.

Most nurses (94%, $n=16$) disagreed that the patient perspiring influenced the dose of analgesia administered. Of those who disagreed, 8 recorded having given a mid dose, and 5 gave the high dose. The 1 subject who agreed with being influenced by patient response gave the high dose. There were 18 missing data indicating patients were not perspiring. The Cramer's V of .34 demonstrated a weak relationship between the perspiring patient and the dose of analgesia administered. Of those who responded, 47% gave the mid dose, 35% the high dose, and 18% gave the lowest dose of analgesia.

Patient had normal blood pressure, pulse, and respirations had 19 responses with 47% ($n=9$) who disagreed and 53% ($n=10$) who agreed. Of those who disagreed, all said

they gave the low to mid dose, while 90% of those who agreed said they gave the mid to high dose.

There were 16 missing data indicating the nurses were not concerned with the patient's vital signs when administering analgesia. The Cramer's V of .57 demonstrated a moderately strong relationship between the patients with normal vital signs and the dose of analgesia administered. Of those who responded, 58% gave the mid dose, 26% the high dose, and 16% the lowest dose of analgesia.

There was a pattern to patient physiological responses. More nurses disagreed that rapid pulse, rapid respirations, and normal vital signs influenced the dose of analgesia administered. More nurses agreed that elevated blood pressure and patient perspiring influenced the dose of analgesia administered. Nurses who disagreed they were influenced by patient responses gave a mid to high dose range consistently, while nurses who agreed that physiological factors did influence their decision gave the mid dose or low dose more frequently than the high dose.

Behavioral Responses

The second research question was: What is the relationship between patient behavioral response to pain and the dose of postoperative analgesia administered to the patient? Behavioral responses were elicited in items 6-11 on the instrument. Frequency distribution and percentages

are discussed (Table 3). Again, the items were prefaced by the statement: I gave my patient pain medication because he/she: was crying (item 6), was moaning (item 7), was rubbing a painful body part (item 8), was pointing to a painful body part (item 9), had increased muscle tension (item 10), had a grimacing facial expression (item 11).

Patient was crying had 14 responses: 43% ($n=6$) disagreed and 57% ($n=8$) agreed. Of those who agreed that the patient crying influenced the dose of analgesia, the majority gave the mid dose; of those who disagreed, half gave the highest dose of analgesia. There were 21 missing data indicating that patients were not crying. The Cramer's V of .45 demonstrated a moderately strong relationship between the patient who was crying and the dose of analgesia administered. Of those who responded, 56% gave the mid dose, 29% the high dose, and 14% gave the lowest dose of analgesia.

Patient was moaning had 16 responses: 19% ($n=3$) disagreed, and 81% ($n=13$) agreed. Of those who disagreed that the dose was influenced by the patient's moaning, all gave the highest dose of analgesia, while, of those who agreed, 54% ($n=7$) gave the mid dose, 31% ($n=4$) gave the high dose, and 15% ($n=2$) gave the lowest dose. There were 19 missing data indicating patients were not moaning. The Cramer's V of .54 demonstrated a moderately strong

relationship between the patient who was moaning and the dose of analgesia administered. Of those nurses who responded, 44% gave the mid dose, 44% the high dose, and 13% gave the lowest dose of analgesia.

Patient was rubbing a painful body part had 15 responses, to which 20% ($n=3$) disagreed. Of those who disagreed, 2 gave the highest dose and 1 gave the lowest dose. Of the 80% ($n=12$) who agreed that they were influenced by the patient response, 58% ($n=7$) gave the mid dose, 25% ($n=3$) gave the lowest dose, and 2 gave the highest dose. There were 20 missing data indicating patients were not rubbing a painful body part. The Cramer's V of .47 demonstrated a moderately strong relationship between the patient who was rubbing a painful body part and the dose of analgesia administered. Of those nurses who responded, 53% gave the mid dose, 27% the high dose, and 20% gave the lowest dose of analgesia.

Patient was pointing to painful body part had 18 responses, to which 11% ($n=2$) disagreed, and 88% ($n=16$) agreed. Of those who agreed that the patient's behavior influenced the dose, 63% ($n=10$) gave the mid dose, and 31% ($n=5$) gave the highest dose. Those who disagreed either gave the low or the high dose. There were 17 missing data indicating patients were not pointing to painful body parts. The Cramer's V of .57 demonstrated a moderately strong

relationship between the patient who was pointing to a painful body part and the dose of analgesia administered. Of those nurses who responded, 56% gave the mid dose, 33% the high dose, and 11% the lowest dose of analgesia.

Patients with increased muscle tension had 19 responses with 84% ($n=16$) agreeing that the patient behavior influenced the dose given. Of the 16 who agreed, 56% ($n=9$) gave the mid dose, and 31% ($n=5$) gave the highest dose. Of those who disagreed, 1 gave the mid dose, and 2 gave the highest dose. There were 16 missing data indicating the patients did not exhibit increased muscle tension. The Cramer's V of .28 demonstrated a weak relationship between the patient with increased muscle tension and the dose of analgesia administered. Of those nurses who responded, 53% gave the mid dose, 37% the high dose, and 11% gave the lowest dose of analgesia.

Grimacing facial expression had 21 responses, to which 95% ($n=20$) agreed, and 5% ($n=1$) disagreed. Of those who agreed that the patient's facial expression influenced the dose given, 50% ($n=10$) gave the mid dose, 35% ($n=7$) gave the high dose, and 15% ($n=3$) gave the low dose. The person disagreeing gave the high dose. There were 14 missing data indicating patients did not exhibit grimacing facial expressions. The Cramer's V of .29 demonstrated a weak relationship between patient grimacing facial expression and

the dose of analgesia administered. Of those nurses who responded, 48% gave the mid dose, 38% the highest dose, and 14% the lowest dose of analgesia.

Table 3

Patient Behavioral Responses and Dose of Analgesia
Administered (N=35)

Variable	Range of Analgesia			Cramer's V	Missing Data
	<u>Low Dose</u> <u>n</u>	<u>Mid Dose</u> <u>n</u>	<u>High Dose</u> <u>n</u>		
Crying				.45	21
Agree	1	6	1		
Disagree	1	2	3		
Moaning				.54	19
Agree	2	7	4		
Disagree	0	0	3		
Rubbing Painful Body Part				.47	20
Agree	3	7	2		
Disagree	0	1	2		
Pointing to a Painful Body Part				.57	17
Agree	1	10	5		
Disagree	1	0	1		
Increased Muscle Tension				.28	16
Agree	2	9	5		
Disagree	0	1	2		
Grimacing Facial Expression				.29	14
Agree	3	10	7		
Disagree	0	0	1		

More nurses agreed than disagreed that all behavioral factors influenced the dose of analgesia administered. Those who disagreed that they were influenced by behavioral responses most often gave the highest dose, while those who agreed with being influenced by the behaviors most often gave the mid dose range.

Facilitation of Nursing Care

The third research question was: What is the relationship between the perceived need for facilitation of nursing care and the dose of analgesia administered to the postoperative patient? Included in this question were the following aspects of postoperative care: the need to reposition the patient in bed, the patient's need to cough and deep breathe, the patient's need for ambulation, and the need for dressing change (Table 4). There were 22 responses to this question, to which 9% ($n=2$) disagreed that they were influenced by the patient's need for facilitation of nursing care and the dose of analgesia administered, and 91% that agreed. Of those who disagreed, 9% ($n=2$), 1 gave the low dose and 1 gave the high dose, whereas those who agreed gave the following: 50% ($n=10$) gave the mid dose, 35% ($n=7$) gave the high dose, and 15% ($n=3$) gave the lowest dose. There were 13 missing data indicating nurses did not perceive the need for nursing care measures. The Cramer's V of .33 demonstrated a weak relationship between the perceived need

for facilitation of nursing care, and the dose of analgesia administered. Of those nurses who responded, 46% gave the mid dose, 37% the highest dose, and 18% gave the lowest dose of analgesia.

Table 4

Facilitation of Care and Dose of Analgesia Administered
(N=35)

Variable	Dose Range of Analgesia			Cramer's V	Missing Data <u>n</u>
	<u>Low</u>	<u>Mid</u>	<u>High</u>		
	<u>Dose</u> <u>n</u>	<u>Dose</u> <u>n</u>	<u>Dose</u> <u>n</u>		
Nursing Care					
Agree	3	10	7	.33	13
Disagree	1	0	1		

Patient Characteristics

The fourth research question was: to what extent do nurses report that patient characteristics, i.e., age, gender, or ethnic origin, influence the dose of postoperative analgesia administered to a patient? Frequency distribution, and percentages are reported (Table 5).

Table 5

Patient Characteristics and Dose of Analgesia Administered
(N = 35)

Variable	Dose Range of Analgesia			Cramer's V	Missing Data <u>n</u>
	<u>Low Dose</u> <u>n</u>	<u>Mid Dose</u> <u>n</u>	<u>High Dose</u> <u>n</u>		
Age				.37	12
Agree	3	11	6		
Disagree	1	0	2		
Gender				.15	14
Agree	1	2	1		
Disagree	2	9	6		
Ethnicity				.30	15
Agree	0	2	0		
Disagree	2	9	7		

There were 23 responses to the patient's age factor. Of those who disagreed, 13% ($n=3$), that patient age influenced the dose of analgesia administered, 2 gave the high dose and 1 gave the lowest dose. There were 87% ($n=20$) who agreed that patient age influenced the dose administered, of which 55% ($n=11$) gave the mid dose, 30% ($n=6$) gave the high dose, and 15% ($n=3$) gave the lowest dose. There were 12 missing data indicating that patient's age was not a consideration to the respondents. The Cramer's V of .37 demonstrated a moderate relationship between the patient's age and the dose of analgesia

administered. Of those nurses responding, 48% gave the mid dose, 35% the high dose, and 17% gave the lowest dose of analgesia.

Patient gender had 21 responses with 87% ($n=17$) who disagreed. Of those who disagreed that the dose administered was influenced by patient gender, two patients were given the low dose, 53% ($n=9$) the mid dose, and 35% ($n=6$) the high dose. Four (19%) responses agreed that patient gender influenced the dose given, to which 2 gave the mid dose, 1 gave low dose, and 1 gave the highest dose. There were 14 missing data indicating patient gender was not a consideration to the nurse administering analgesia. The Cramer's V of .15 demonstrated a weak relationship between patient gender and the dose of analgesia administered. Of the nurses responding, 52% gave the mid dose, 33% the highest dose, and 14% gave the lowest dose of analgesia.

Patient ethnicity had 20 responses with 90% ($n=18$) disagreeing and 10% ($n=2$) agreeing. Of those who disagreed that the dose of analgesia administered was influenced by patient ethnicity, 50% ($n=9$) gave the mid dose, 39% ($n=7$) gave the high dose, and 11% ($n=2$) gave the low dose. Two respondents who said they were influenced by patient ethnicity gave the mid dose.

There were 15 missing data indicating that ethnicity was not a factor considered when analgesia was administered.

The Cramer's V of .30 demonstrated a weak relationship between patient ethnicity and the dose of analgesia. Of the nurses responding, 55% gave the mid dose, 35% the highest dose, and 10% gave the lowest dose. Most nurses agreed that age was a factor that influenced the dose of analgesia administered; more gave the mid dose range of analgesia. Most nurses disagreed that they were influenced by patient gender or ethnicity and gave the mid to highest dose of analgesia.

Patient Self-Report of Pain

The fifth research question was: What is the relationship between the patient self-report of pain and the dose of postoperative analgesia administered? Respondents were asked to record the patient's self-report of pain on a 1-10 scale, with 1 being the least pain and 10 being the most severe pain. Data were collapsed into three categories of pain with: mild (1-3), moderate (4-6), and severe (7-10) (Table 6).

There were 23 responses to this question. One patient reported mild pain (1-3) and was given the lowest dose of analgesia. Six (26%) patients reported moderate pain (4-6) and, of those, 67% ($n=4$) received the mid dose and 33% ($n=2$) received the high dose of analgesia. There were 70% ($n=16$) of patients who reported severe pain. Of those, 12% ($n=2$) were given the lowest dose, 44% ($n=7$) the mid dose, and 44%

($n=7$) the highest dose. There were 12 missing data indicating that patient self-report of pain was not recorded on the questionnaire. The Cramer's V of .42 demonstrated a moderately strong relationship between the patient self-report of pain and the dose administered. Of those responding, 48% gave the mid dose, 39% the highest dose, and 13% administered the lowest dose of analgesia. One might ask why only 39% of the patients with severe pain received the highest dose while 61% with severe pain received the mid to low dose of analgesia. While the sample of this study was small, this supports the data reported by the Agency for Health Care Policy and Research that more than 60% of patients described inadequate pain relief postoperatively.

Table 6

Patient Self-report of Pain and Dose of Analgesia
Administered (N = 35)

Variable	Dose Range of Analgesia			Cramer's V	Missing Data n
	<u>Low</u>	<u>Mid</u>	<u>High</u>		
	<u>Dose</u> n	<u>Dose</u> n	<u>Dose</u> n		
				.42	12
Mild Pain	1	0	0		
Moderate Pain	0	4	2		
Severe Pain	2	7	7		

Nurse Demographics

The last research question was: What is the relationship between nurse demographic data and the dose of postoperative analgesia administered to the patient?

Data were cross-tabulated to analyze the relationship between nurses who have attended a pain workshop and the dose of analgesia administered (Table 7). There were 51% ($n=14$) of the nurses that had not attended a workshop who responded with 64% ($n=9$) giving the mid dose, 29% ($n=4$) the high dose, and 1 who gave the lowest dose. There were 49% ($n=13$) who had attended a pain workshop of whom 46% ($n=6$) gave the high dose, 31% ($n=4$) gave the mid dose, and 23% ($n=3$) gave the lowest dose. There were 8 missing data indicating no response to the workshop question. Of those who responded, 48% gave the mid dose, 37% gave the highest dose, and 15% gave the lowest dose of analgesia. The pattern of more nurses giving the mid dose prevailed, whether nurses attended a pain workshop or not.

Data were analyzed for the frequency distribution between highest level of education and the dose of analgesia administered (Table 8). There were 17% ($n=6$) with a Diploma of Nursing, 29% ($n=10$) with an AA, and 49% ($n=17$) with a BSN. There were 8 missing data.

Table 7

Attended Pain Workshop and Dose of Analgesia Administered
(N = 35)

Variable	Dose Range of Analgesia			Missing Data
	<u>Low</u>	<u>Mid</u>	<u>High</u>	
	<u>Dose</u>	<u>Dose</u>	<u>Dose</u>	
	<u>n</u>	<u>n</u>	<u>n</u>	<u>n</u>
Attended Workshop				
Yes				8
No	3	4	6	
	1	9	4	

Table 8

Highest Level Education and Dose of Analgesia Administered
(N = 35)

Variable	Dose Range of Analgesia			Missing Data
	<u>Low</u>	<u>Mid</u>	<u>High</u>	
	<u>Dose</u>	<u>Dose</u>	<u>Dose</u>	
	<u>n</u>	<u>n</u>	<u>n</u>	<u>n</u>
Diploma	1	1	2	8
Associate of Arts	0	5	4	
Bachelor of Science				
in Nursing	3	7	4	

Of those who responded, 48% gave the mid dose, 37% gave the highest dose, and 15% gave the lowest dose of analgesia.

There were 2 diploma nurses who gave the highest dose and one who gave the mid or lowest dose, respectively. Five associate degree nurses gave the mid dose and 4 the highest dose. Seven bachelor prepared nurses gave the mid dose, 4 the highest dose, and 3 the lowest dose. Nurses of all levels of education administered the whole spectrum of variable dose range analgesia; however, more nurses gave the mid dose range than the high or low range, regardless of education.

Data were analyzed for the frequency distribution between the department worked and the dose of analgesia administered (Table 9). There were 33% ($n=9$) of the respondents from the surgical unit. Of those responding, 5 gave the mid dose while 4 gave the highest dose. The orthopedic-neuro respondents were 41% ($n=11$) of the sample.

Of those responding, 4 gave the mid dose, 4 gave the highest dose, and 3 gave the lowest dose. There were 26% ($n=7$) respondents from the cardiovascular-cardiopulmonary (CPC) unit. Of those responding, 4 gave the mid dose, 2 the highest dose, and 1 the lowest dose. There were 8 missing data.

Table 9

Department Worked and Dose of Analgesia Administered
(N = 35)

Variable	Dose Range of Analgesia			Missing Data
	<u>Low</u>	<u>Mid</u>	<u>High</u>	
	<u>Dose</u>	<u>Dose</u>	<u>Dose</u>	
	<u>n</u>	<u>n</u>	<u>n</u>	<u>n</u>
Department				8
Surgical	0	5	4	
Ortho-Neuro	3	4	4	
CPC	1	4	2	

Data were analyzed for the frequency distribution between the shift worked and the dose of analgesia administered. There were 33% who worked the day shift, 41% who worked evenings, and 26% who worked nights. Of those responding, 48% gave the mid dose, 37% gave the highest dose, and 15% gave the lowest dose. There were 8 missing data.

The last question on the survey was an open-ended question which gave the respondent the opportunity to list any factors not addressed in the survey that influenced the dose of postoperative analgesia administered. The following factors were listed by respondents: (a) patient drug dependence, (b) several operative procedures within the past year, (c) elderly (age 99) patient was hard of hearing and

did not understand query if in pain, (d) dose previously given that was effective, (e) oral or injectable medication, (f) patient's weight, (g) type of surgery, (h) history of drug used, (i) diet, (j) number of days since surgery, (k) patient reported severe pain after receiving the highest dose ordered, and (l) patient refused medication due to nausea. One respondent wrote: "I have had multiple spinal surgeries and have been the victim of inadequate postop pain management."

Table 10

Shift Worked and Dose Range of Analgesia Administered

(N = 35)

Variable	Dose Range of Analgesia			Missing Data
	<u>Low</u>	<u>Mid</u>	<u>High</u>	
	<u>Dose</u>	<u>Dose</u>	<u>Dose</u>	
	<u>n</u>	<u>n</u>	<u>n</u>	<u>n</u>
Shift				8
Days	2	3	4	
Evenings	0	6	3	
Nights	2	2	3	

Summary

This study showed that the nurses who participated in the study were influenced by some physiological patient

responses, all behavioral signs, and patient age when administering postoperative analgesia. Due to the small sample and number of variables, one cannot generalize any results to the population at large. Data collected only reflect the opinions of the participants at the time the data were being collected.

One observation that warrants mention is that 70% of the patients' self-report of pain was reported as severe (7-10) and 49% were given the mid dose, 39% the high dose, and 12% the lowest dose. These data support literature that states patients report their pain is not adequately treated. One survey respondent reported having experienced being a postoperative patient who was not relieved of pain.

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study used a descriptive survey to explore 15 factors that influenced the dose of postoperative analgesia administered to adults when a variable dose range was prescribed. Patient physiological and behavioral responses, patient age, gender, ethnicity, the nurse's perceived need for the facilitation of nursing care, patient self-report of pain, and patient and nurse characteristics were examined to see if there was a relationship between any of the factors and the dose of analgesia administered.

The convenience sample was 35 nurse volunteers from three units who admitted postoperative patients at a 400 bed Bay Area hospital in Northern California. The data collection instrument was a 26 item questionnaire that used Likert scale responses and open-ended statements to gather demographic data and explore factors that influenced the dose of analgesia administered postoperatively.

Physiological Patient Response

Five physiological patient responses were explored to analyze if a relationship existed between the dose of analgesia administered and the patients' physiological responses to pain. Contrary to literature, more nurses stated that they were not influenced by patients' rapid

pulse, rapid respirations, and patients' perspiring when giving analgesia to their patients. However, more nurses did agree that patients' elevated blood pressure and patients with normal vital signs influenced the dose given. A pattern showed that those who disagreed that physiological responses had an influence on the dose given gave higher doses of medication than those who agreed that they were influenced by the factors. Because the sample was small, independence of variables could not be established during data analysis, so strength of relationships between variables were reported in Cramer's V values. The only physiological factor that did show a moderately strong relationship between the dose administered was the patient with normal vital signs. One might speculate that nurses were not as fearful of over-medication when the patient's vital signs were normal.

Behavioral Responses

Six patient behavioral signs were explored to see if a relationship existed between the dose of analgesia administered and the patients' behavioral responses to pain. Most nurses agreed that the dose administered was dependent upon patient behavioral signs of crying, moaning, rubbing or pointing to a painful body part, increased muscle tension, and/or a grimacing facial expression. There was a moderately strong relationship between the dose of analgesia

administered and patients who were crying, moaning, and/or rubbing or pointing to a painful body part. Most nurses influenced by behavioral responses reported that they gave the mid dose range rather than the highest dose of analgesia.

Facilitation of Nursing Care

Routine postoperative care entails measures that cause the patient to experience an increase in pain. Knowledge of this demands the nurse plan ahead for this increase in painful activity so that the analgesia will be effective in time for the increased pain. Most nurses agreed that the dose of analgesia administered was dependent upon patients' need for nursing care measures. The majority of nurses reported that they gave the mid to highest dose of analgesia when they anticipated patient need produced by nursing care measures.

Patient Characteristics

Patient age, gender, and ethnicity were analyzed to see if a relationship existed between the dose of analgesia administered and the patient characteristics. Contrary to literature, the majority of nurses did not agree that the dose of analgesia administered was influenced by patient gender or ethnicity. The majority of the nurses responding to the patient age factor reported that the dose of

analgesia administered was dependent on patient's age, which follows previous research findings.

Patient Self-Report of Pain

Patient self-report of pain was recorded at the time the analgesic was administered. Data were collapsed into three categories of mild, moderate, and severe pain. There were 70% of the patients who reported severe pain. Forty-nine percent of the nurses reported giving these patients in severe pain the mid range dose of analgesia. The high dose was reported to have been given in 39% of the cases and the lowest dose given in 12% of the cases. One wonders what influenced the nurses to give the patient with the most severe pain the lowest to mid dose range. Literature supports multiple physiological and behavioral patient factors that influence the dose administered, as well as the nurse's own experiences, perceptions, attitudes, personal and institutional values, cultural beliefs, and personal biases (Agency for Health Care Policy & Research, 1992; American Pain Society, 1992; Christoph, 1991; Donovan, 1990; McCaffery & Beebe, 1989; McCaffery & Ferrell, 1991a; McCaffery, Ferrell & O'Neil-Page, 1992). One factor that was not solicited on the survey was whether the dose given was dependent upon the availability of the unit-dose drug. All narcotics are controlled substances and require that two nurses sign when a portion of a dose is not given or wasted.

To waste a portion of a dose, the nurse would have to find another nurse to observe and co-sign the wasted portion, which takes time. One might ask whether lesser doses were given because the unit-dose available was more convenient to administer.

Nurse Demographics

Data were collected to report the nurses' gender, years in nursing practice, the department and shift worked, highest level of education, and ethnicity. Nurses were also asked if they had ever attended a pain workshop. Data showed nearly half had attended a workshop, which indicated that nurses were interested in learning more about the topic of pain. This study did not demonstrate that a relationship existed between the dose of analgesia administered and prior attendance of a pain management workshop. No patterns emerged in this study that showed a relationship between level of education, department or shift worked, and the dose of analgesia administered.

Summary

This study utilized Orlando's nursing process theory which has three elements: (a) the behavior of the patient, (b) the reaction of the nurse, (c) the nursing actions designated for the patient's benefit (Marriner-Tomey, 1989). Nurses were asked to record the patients' self-report of pain and indicate patient physiological and behavioral

responses that influenced the dose of analgesia administered to a postoperative patient. The nurse reacted to patients' report of pain, physiological and behavioral responses according to experience with the patient, personal experience with pain, perceptions, cultural or institutional values, or personal biases. Based on the nurse's perception of patients' pain, the nursing action to relieve the patients' pain was decided when the dose of analgesia was administered. This study showed that each nurse approached patients' pain individually and differently in accordance with the nurse's own value system. Past research has established that there are many factors that influence pain control. Reports still show, however, that pain is undertreated despite the awareness of these factors. Further research needs to be done to analyze why patients still report that pain is inadequately managed.

Recommendations

Since pain is a difficult phenomenon to measure and there is still a lack of knowledge about pain control as well as fear of side effects of analgesics, educational programs need to continue addressing research findings and promote the use of the 1992 Pain Guidelines developed by the Agency for Health Care Policy and Research. Hospital Quality Assurance programs need to address departmental pain management to improve pain management outcomes.

Tools to evaluate pain management are scarce in the literature. Therefore, a tool needs to be developed to encompass all the factors that influence the dose of analgesia administered as well as the effectiveness of the treatment. The instrument used in this study gave the respondents the Likert scale choice of "did not apply to the patient" in cases where the patient did not exhibit the selected factor. The choice of disagree was to be used when the patient exhibited the selected factor, e.g., crying, but the dose administered was not influenced by fact that the patient was crying. Respondents may have been confused by two Likert scale choices because many chose the answer: "did not apply to the patient." The choice "did not apply to the patient" limited the statistical analysis because of the small sample. A forced choice scale is recommended for further study.

Replication of the study could be done in different settings with larger samples so that more robust statistical analysis could be done. It is recommended that the Likert scale responses be modified to lessen the chance of confusion for the respondent.

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APPENDIX A
DATA COLLECTION FORM

SURVEY

Please complete BOTH SIDES of this survey about factors that influence your decision to administer analgesia to an adult (age 18 and older) patient who has had surgery within the past 72 hours.

Circle the number that corresponds to your opinion. Answer each question using the rating scale:

- 1 = strongly disagree
- 2 = disagree
- 3 = agree
- 4 = strongly agree
- 5 = did not apply to patient

I gave my patient pain medication because he/she:						
1.	had an elevated BP	1	2	3	4	5
2.	had a rapid pulse	1	2	3	4	5
3.	had rapid respirations	1	2	3	4	5
4.	was perspiring	1	2	3	4	5
5.	had normal BP, pulse, respirations	1	2	3	4	5
6.	was crying	1	2	3	4	5
7.	was moaning	1	2	3	4	5
8.	was rubbing a painful body part(s)	1	2	3	4	5
9.	was pointing to a painful body part(s)	1	2	3	4	5
10.	had increased muscle tension	1	2	3	4	5
11.	had grimacing facial expression	1	2	3	4	5
12.	needed facilitation of nursing care; i.e., repositioning in bed, coughing and deep breathing, ambulation, dressing changes.	1	2	3	4	5

TURN THE PAGE

The dose of medication I administered was influenced by:

13. patient's age	1	2	3	4	5
14. patient gender	1	2	3	4	5
15. patient ethnic origin	1	2	3	4	5

It is often the standard of practice for a physician to write a postoperative order which gives the choice of a variable dose range of analgesia; i.e., Demerol 50-100mg q 3-4 hrs PRN. Please check (✓) your response. Check only one of the following five possible answers.

16. I gave my patient:

- _____ the lowest variable dose range
- _____ the mid variable dose range
- _____ the highest variable dose range
- _____ a dose ordered by the physician that did not give the choice of a variable dose range
- _____ a bolus dose ordered on the PCA pump

17. As you ask your patient to rate his pain on a 1-10 scale, with 1 being the least pain and 10 being the most severe pain, record that number here _____.

NURSE DEMOGRAPHIC DATA

Please fill in or check (✓) the data that pertains to YOU:

- 18. _____ Gender: male/female
- 19. _____ Department
- 20. _____ Number of years in practice
- 21. _____ Number of years of experience in current area of practice
- 22. _____ Have attended a Pain Management Workshop
- 23. _____ Shift worked: days/evenings/nights

CONTINUE TO NEXT PAGE

24. Highest level of education

- _____ Diploma
- _____ AA
- _____ BSN
- _____ Bachelors degree in another field
- _____ MSN
- _____ Masters degree in another field
- _____ Other

25. Please write any factors below that influenced the dose of analgesia you administered to your patient that were not addressed in this survey.

APPENDIX B
HUMAN SUBJECT CONSENT FORM

A member of The California State University

School of Applied Arts and Sciences • Department of Nursing • Graduate Program
One Washington Square • San Jose, California 95122-0057 • 408/924-3134

CONSENT TO BE A RESEARCH SUBJECT

An Investigative Survey of Factors That Influence
Nurses' Decision to Administer Postoperative Analgesia to
the Adult Patient

Principle Investigator:

Caryl J. Brown RN MS(C) CCRN
Good Samaritan Hospital
2425 Samaritan Drive
San Jose, Ca. 95124

Sponsoring organization:

San Jose State University
Graduate Nursing Department
Bobbie Gorenberg D.N.Sc.
One Washington Square
San Jose, Ca. 95192

INTRODUCTION:

This form is known as an "informed consent form". You should read it carefully and ask questions before you decide whether or not to consent to participate in the study. Prior to your consenting to participate, a staff nurse will discuss the information contained in this form with you. If there are medical or scientific terms used in the discussion on this form which you do not fully understand, please ask the person obtaining your consent to explain them to you. If you decide to participate, you will be given a copy of this consent form to keep.

PURPOSE AND BACKGROUND:

Part of the nursing process is the assessment and evaluation of patient response. Each patient is different, and each nurse approaches the assessment and evaluation of patient response in accordance with her/his own assessment, evaluation, and value systems.

The purpose of this study is to survey nurses to measure the degree of influence that selected factors have on the dose of analgesia administered to the adult postoperative patient.

CONFIDENTIALITY:

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission to people not connected with the project.

Initial _____

TURN PAGE

PROCEDURE:

Registered Nurses employed at the Good Samaritan Hospital participating in this study will complete the survey on one patient at the time the analgesic is administered. Surveys will be numbered to insure anonymity. Your name will not be on the survey. Information will only be identifiable by shift and department worked.

RISKS:

There are no known risks to the patient or the nurse participating in this study.

BENEFITS:

There are no immediate personal benefits to you for participating. Clinical nursing research is an exciting opportunity to be a part of scientifically based findings that can affect standards of practice.

COSTS:

Neither the Good Samaritan Hospital of Santa Clara Valley nor its agents or employees will compensate you for your participation in this study or reimburse you for the costs of the above procedures or courses or treatment.

RIGHTS:

Participation in this study is voluntary, and you are free to withdraw your prior consent and to discontinue participation in the study at any time. No penalty or loss of services to which you are otherwise entitled will result from your decision not to participate in the study or to withdraw from it once it has begun. If you have any questions or complaints about the study, or if you believe you have suffered a research-related injury, you should contact Caryl Brown at (408) 559 2207. You also may address questions or complaints to Bobbye Gorenberg D.M.Sc., Graduate Coordinator, San Jose State University, at (408) 924-3124. Questions or complaints about research subjects' rights, or research-related injury may be presented to Serena Stanford, PhD., Associate Vice President of Graduate Studies and Research, at (408) 924-2480. You are making a decision whether or not to participate in a research project. Your signature on this informed consent below indicates that you have read and understood the information provided in this form, that you have been verbally informed about the study, that you have had time to ask questions, that you have decided to participate, and that you consent to the procedures described above.

Date and time

Participant

APPENDIX C
CONSENT LETTERS

THE
**GOOD
SAMARITAN
HOSPITAL**
OF SANTA CLARA VALLEY

2425 SAMARITAN DRIVE
SAN JOSE, CALIFORNIA 95124
(408) 559-2011

An Affiliate Of

**HEALTH
DIMENSIONS
INCORPORATED**

THE GOOD SAMARITAN HOSPITAL
OF SANTA CLARA VALLEY
SAN JOSE MEDICAL CENTER
SOUTH VALLEY HOSPITAL
HEALTH ADVANTAGE
HEALTH ADVANTAGE VENTURES

August 26, 1992

Caryl Brown
952 Scottsglen Court
San Jose, CA 95136

Dear Caryl,

This letter is to indicate administrative support from the Good Samaritan Hospital of the Santa Clara Valley for the research of investigative factors that influence nurses' decisions to administer post operative analgesia.

I have discussed the research with the Medical Staff Director, Gus Samios, M.D., and we will grant permission for the research to be conducted at our facility. I understand that this research is being conducted as partial fulfillment for a Master's Thesis in nursing at San Jose State University. Both Dr. Samios and I wish you well in this endeavor and look forward to your sharing the results with us.

Sincerely,

Joan C. White
Vice President of Patient Care

JCW:pap

A campus of The California State University

Office of the Academic Vice President • Associate Academic Vice President • Graduate Studies and Research
One Washington Square • San Jose, California 95192-0025 • 408/924-2480

To: Caryl Brown
952 Scotsglen Ct.
San Jose, CA 95136

From: Serena W. Stanford *Serena W. Stanford*
AAVP, Graduate Studies and Research

Date: December 2, 1992

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"An Investigative Survey of Factors that Influence
Nurses Decision to Administer Analgesia to the Adult
Postoperative Patient"

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Dr. Serena Stanford immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that each subject needs to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have questions, please contact me at 408-924-2480.

CC: Jean Sullivan