1993

Relationship of Patient Age to Amount of Postoperative Analgesic Prescribed and Administered

Beth Lee Sendre
Grand Valley State University

RELATIONSHIP OF PATIENT AGE TO AMOUNT OF POSTOPERATIVE ANALGESIC PRESCRIBED AND ADMINISTERED

BY

Beth Lea Sendre

A THESIS

Submitted to
Grand Valley State University
in partial fulfillment of the requirements for the
degree of

MASTER OF SCIENCE IN NURSING

Kirkhof School of Nursing

1993

Thesis Committee Members

Katherine Kim, R.N., Ph.D.

Andrea Bostrom, R.N., Ph.D.

Debra Berry, R.N., M.S.N.

ABSTRACT

RELATIONSHIP OF PATIENT AGE TO AMOUNT OF POSTOPERATIVE ANALGESIC PRESCRIBED AND ADMINISTERED

By

Beth L. Sendre

The purpose of this study was to determine if elderly patients receive less analgesic than younger patients postoperatively and if that reduction in analgesia results from the physician's order, the administration, or both. Hospital records of 161 females with abdominal surgery were reviewed to collect data. The sample was divided into 6 age groups. The findings did not support with increased age from 25 years, less analgesic medication was prescribed for the first and second 24 hour period postoperatively ($p > .05$). The findings indicate, as age increased from 25 years, less analgesic medication was administered in the first 24 hours ($p < .05$), but not for the second 24 hours ($p > .05$). A paired t test indicated for each age group significantly less analgesia was administered than was prescribed ($p < .05$). Implications for nursing practice were identified.

ACKNOWLEDGEMENTS

I would like to thank the following members of my committee: Dr. Andrea Bostrom, for her expertise and direction; Debra Berry, a true friend, who gave me support and guidance throughout my research process; and a special thank you to my committee chairperson, Dr. Katherine Kim, who encouraged me to grow in such a kind and gentle way. Lastly, I sincerely appreciated the cooperation and helpfulness of the staff and administration at the study site.

Table of Contents

List of Tables

TABLE

List of Appendices

APPENDIX

CHAPTER 1

INTRODUCTION

Aging individuals encounter a number of problems associated with their developmental process. They are more prone to chronic illness; they are known to have more degenerative maladies (Herr & Mobily, 1991); and they are subject to increasing hospitalization in direct proportion to their age (Wolanin, 1983). All of these reports give evidence to the increasing number of elderly with potential pain experiences. Unfortunately at this time, there is a lack of gerontological nursing research to guide pain management in the elderly (Acute Pain Management Guideline Panel, 1992; Carnevali & Patrick, 1986; Faherty & Grier, 1984; Ferrell & Ferrell, 1990; Wells, 1987).

Pain and its relief are subjective individual experiences influenced by a variety of factors (Binks, 1974; Harrison & Cotanch, 1987; Herr & Mobily, 1991; Patwell, 1987; Wallace & Norris, 1975). These factors include moods, emotions, cultural background, gender, significance of pain to the patient, physiological changes associated with aging, and past pain experiences (Eland, 1988; Herr & Mobily, 1991).

Because of this subjectivity, pain is difficult to describe, measure, and ultimately treat.

Research supports the thesis that patients are suffering unnecessary pain because they are not being medicated correctly (Cohen, 1980; Eland, 1988; Faherty & Grier, 1984; Lisson, 1987; McCaffery & Hart, 1976; Weis, Sriwatanakul, Alloza, Weintraub & Lasagna, 1983). This situation worsens for the postoperative elderly. "Unlike younger patients, the elderly may come to the postoperative period with more pain experiences, i.e., arthritis, peripheral vascular disease, and previous surgery" (Patwell, 1987, p. 34). In addition, some caregivers incorrectly assume that the elderly have high pain thresholds (Acute Pain Management Guideline Panel, 1992). Consequently, the elderly are given lower doses of medication when in fact what they need is the same dosage as other adults, only administered less frequently (McCaffery, 1985). Clearly, pain is inconsistently managed in the elderly.

Inconsistency in medication administration for postoperative pain may occur for various reasons: lack of communication between the caregiver and the patient; inadequate pharmacological knowledge by the attending nurse; the concern that patients may become dependent on narcotics; cultural biases; and the belief that pain is something with which the patient

must live (Dodd, 1986; Donovan, 1987; Saxey, 1986; Short, Burnett, Egbert, & Parks, 1990). As a result, elderly patients experience postoperatively, moderate to severe levels of unnecessary pain (Ketovuori, 1987; McCaffery & Hart, 1976; Short, Burnett, Egbert, & Parks, 1990).

Ferrell and Ferrell (1990) state, "There is a significant relationship between pain and an elder's functional status and overall quality of life" (p. 177). Patients who are experiencing pain are at higher risk for depression, which can interfere with their rehabilitation potential (Liebeskind & Melzack, 1988). Believing that freedom from pain should be a basic human right (Carr, 1990; Liebeskind & Melzack, 1988; Wallace & Norris, 1975), and knowing that pain relief can help to prevent postoperative complications (Carr, 1990; Cohen, 1980; Wallace & Norris, 1975), alleviating postoperative pain should be a fundamental nursing responsibility.

In order to provide maximum pain relief postoperatively for the elder, the nurse must adequately assess the pain, clearly communicate the findings, and promptly implement the treatment. Lazarus's Theory of Stress Appraisal and Coping would assist the nurse in adequately assessing the extent of the elder's pain and the coping mechanisms being used (Lazarus & Folkman, 1984). Erickson's Theory of

Modeling-role Modeling would help guide the nurse's assessment and give direction for the nursing intervention needed to provide a pain free postoperative period (Erickson, Tomlin, & Swain, 1983). As Campbell, Finch, Allport, Erickson, and Swain (1985) state, "The goal of nurses caring for clients is to achieve a state of perceived optimum health and contentment" (p. 112).

Problem Statement

For two reasons, issues of successful aging and of quality life in old age have become important topics of study for nurses. First, elders constitute the fastest growing population within our society, and experts project this trend will continue (Herr & Mobily, 1991; Strumpf, 1987). Second, nurses are the most frequent caregivers to postoperative elderly patients. As Donley (1988) states, the elderly "often lack the energy, time, and information to create or negotiate a safe adequate system of care" (p. 302). Thus, nurses must be advocates for the elderly patient in pain.

Despite the importance of research in pain management for the elderly, few studies have been reported in the literature. The purpose of this writer's study, therefore, was: to determine if less postoperative analgesic was prescribed for the elderly by the physician; to determine if less postoperative

analgesic was administered to the elderly by the nurse; or a combination of both.

This writer's study replicates a previous study by Faherty and Grier (1984). This writer's study was conducted with an urban population and will strengthen the Faherty and Grier (1984) study.

Analgesic refers to all medication given to aid in relieving pain. The analgesic given may have been narcotic or nonnarcotic.

CHAPTER 2

LITERATURE REVIEW, CONCEPTUAL FRAMEWORK, AND HYPOTHESIS

Literature Review

There is limited research in the literature regarding analgesic for the postoperative elderly. The following studies have been reviewed: surveys of patients, physicians, and nurses regarding ideas about postoperative pain; the analgesic prescribed by physicians and the actual amounts administered by nurses; and the quality of pain relief afforded the patient as evaluated by the patient.

Conceptions about Postoperative Pain

In a descriptive correlational study by Ketovuori (1987), patients and nurses answered a pain questionnaire to assess their own concepts of postoperative pain. Twenty two patients aged 24-61 years of age described their laparotomy postoperative wound pain at its highest intensity on the third postoperative day by answering the Finnish Pain Questionnaire (FPQ). Twenty-nine nurses who had not experienced wound pain and 33 nurses who had experienced wound pain also answered the FPQ. In addition, the nurses answered questions about the aim of analgesic dosing, the risks of addiction, and the

correct intervals of administering the narcotic, oxycodone.

Results of the Ketovuori study indicated that nurses who had not experienced wound pain estimated the intensity of wound pain higher than both patients and nurses who had experienced wound pain. Both groups of nurses did not adequately interpret the patient's pain and consequently did not administer sufficient analgesic to relieve the pain completely. Also, a majority of nurses overestimated the risk of narcotic addiction.

A descriptive study by Weis, Sriwatanakul, Alloza, Weintraub, and Lasagna was conducted in 1983. This study among housestaff physicians and nurses involved with postoperative patient care assessed knowledge of analgesics and attitudes toward postoperative analgesic care. Questionnaires about the use of narcotics in analgesic care were sent to 97 housestaff physicians and 142 nurses actively involved in patient care on surgery, orthopedic, and gynecology wards. One hundred patients 18-65 years of age who consented to participate were also given a questionnaire to answer preoperatively. Of these patients, 66 were monitored postoperatively to assess the effectiveness of pain relief. The total amount of narcotic analgesic received postoperatively was recorded for the first and second 24 hour periods.

Seventy-two hours after surgery the 66 patients were asked if they had found their postoperative pain relief to be adequate.

Findings of the Weiss, et al. study indicated 41 percent of the physicians and 20 percent of the nurses believed patients do not receive adequate analgesic care. Fifty-four percent of physicians and 74 percent of nurses believed analgesic care is adequate. Five percent of physicians and 6 percent of nurses thought patients were overtreated. However, 41 percent of the patients indicated experienced moderate to severe pain four hours after receiving the analgesic.

Limitations of the Ketovuori (1987) and Weis. Sriwatanakul, Alloza, Weintraub, and Lasagna (1983) studies included lack of a theoretical framework, possible bias of the interviewer, self selection of the participants, and limited generalizability. However, these two studies do support a thesis of inaccurate understanding of postoperative pain by nurses and physicians. Consequently, these two studies would seem to suggest that patients may suffer from pain unduly.

<u>Analgesic Prescribed and Administered</u>

Faherty and Grier in 1984 conducted an ex post facto study looking at analgesic prescribed and the actual amount administered postoperatively to elderly patients. The hospital charts of the elderly subjects

were reviewed to determine both the amount of analgesic prescribed and the amount administered. A total of 772 subjects were stratified into 10-year age groupings. Within each age group, males and females were randomly selected. The patients ranged in age from 25 to 100 years old and had experienced either abdominal or pelvic surgery in 1980. The independent variable was age; the dependent variables were the analgesic prescribed by physicians and the amount of analgesic administered by nurses.

In this Faherty and Grier study, the amount of prescribed analgesic began to decrease significantly at 55 years, and the amount of analgesic administered began to decrease at 45 years. The results suggest that the smaller amounts of analgesic administered were a consequence of the smaller amounts prescribed. Nurses also administered less analgesic during the second 24 hour postoperative period than during the first, even though a larger dosage had been prescribed for the second 24 period than the first 24 hours.

A descriptive study was conducted in 1990 by Short, Burnett, Egbert, and Parks. The charts of 56 elderly male patients, aged 60 years and older on the surgical nursing units, were examined retrospectively to determine the amount of prescribed narcotic received postoperatively. Those 40 nurses who had made the medication decisions and had administered the

narcotics also were surveyed to determine which factors had influenced their decision making. The prescribed versus administered parenteral analgesic was tabulated through the first postoperative day. The independent variable was age: the dependent variables were the amount of analgesic ordered by the physician and the amount of analgesic administered by the nurse. A two part survey was completed by the nurses. The first part elicited spontaneous responses about analgesic administration. In the second part. nurses indicated the importance of 30 factors used to determine when and how much analgesic to administer to postoperative elderly patients having a prescribed dosage and frequency range.

In this study by Short et al., the amount of narcotic analgesic the elderly patients received on the first postoperative day was substantially less than the amount prescribed. The following criteria for administering analgesics were ranked first by the nurses for importance in decision making: respiratory rate (18%), type of surgery (10%), patient's overall condition (10%), age (10%), and time since last medication (10%).

A descriptive study by Saxey (1986) of 19 postoperative patients was conducted to identify their patterns of pain experience. The study used a structured pain observation chart with a simple

descriptive scale. The patient was asked to indicate the term that best described the pain experienced at the time of the questioning. Included in the study was a survey of the patterns of analgesic administration by nurses caring for the study patients (Saxey, 1986). A semi-structured interview of 35 nurses was conducted to determine: the criteria used to assess a patient's pain; the goals of postoperative analgesia; the nurse's knowledge of analgesics; the nurse's perception of self as mediator of pain relief; the nurse's understanding of pain relief methods, and the nurse's level of satisfaction with postoperative pain control.

This study by Saxey revealed that maximum postoperative pain control was not achieved for the patient and that the nurses did not seem to have sufficient knowledge of pain assessment. The study also indicated, that nurses' beliefs about postoperative pain and its relief may affect their interpretation of "as needed" prescriptions and may be reflected in their patterns of analgesic administration. In addition, nurses may have an inadequate knowledge of narcotic drugs, an inadequacy that could result in inappropriate administration of analgesics at intervals greater than that required.

The studies by Faherty and Grier (1984); Short, Burnett, Egbert, and Parks (1990); and Saxey (1986)

found that elderly postsurgical patients have less analgesic prescribed than patients not in an elderly category, and also less analgesic administered than much younger patients. Therefore, postoperative pain was not ideally controlled for the postoperative elderly.

Limitations of these three studies included failure to use a theoretical model; collection of information at only one point in time; possible bias of interviewers; and limited generalizability. Two of the studies had a small sample size.

Quality of Pain Relief

A correlation study was conducted by Carr in 1990 to determine any difference between a patient's expected pain and the actual pain experienced postoperatively and to identify factors contributing to the management of postoperative pain. A convenience sample of 21 patients from two general surgery wards, one urological ward and one 5-day stay ward, participated in the study. Criteria for selection included absence of pain preoperatively, the ability to use the visual analogue scale, and required consent. The patients were visited on the first postoperative day at 8 AM, 12 PM, 4 PM, and 8 PM. Assessments of pain were made using the visual analogue scale. A list of the analgesics prescribed

and all doses given was collected from each patient's chart.

Carr's study determined that most patients underestimated the pain they would experience and that many patients complained of severe postoperative pain on the first day despite the availability of narcotics. The physicians' analgesic prescriptions on an "as needed" basis contributed to ineffective pain relief. Also, the patient's inadequate information about postoperative pain contributed to increased anxiety and pain.

A descriptive correlational study by Dodd in 1986 evaluated nursing management of postoperative pain and nausea in adult patients. The patterns of pain medication were correlated with the quality of pain relief achieved. Twenty-two postoperative adult patients from the orthopaedic, surgical, urology, and critical care units participated. Pain levels were assessed at rest and during activities for three days postoperatively. The visual analogue scales for pain and nausea were filled in by the patient. The respiratory rate was recorded at 8 AM, 12 PM, and 4 PM each day.

Wide variations occurred in the quality of pain control achieved postoperatively. Similarly wide variations occurred also in the patterns of analgesic administration. A significant proportion of patients

showed unacceptably high levels of pain, perhaps the consequences of undertreatment. Interestingly, patients and nurses had conflicting expectations about who should initiate the request for pain relief medication.

A descriptive study by Cohen in 1980 assessed and described the adequacy of pain relief in hospitalized post surgical patients and the ways in which nurses on the same units chose the analgesic to be administered. The sample consisted of 109 surgical patients in 6 surgical units of 5 general hospitals. Criteria for inclusion in the study included: an age between 18 and 69; hospitalization for abdominal surgery; no history of prior surgery; an "as needed" prescription for one or more narcotic analgesics; and an adequate level of consciousness to answer questions. Each patient was interviewed for 20 minutes early on the third postoperative day. Additionally, a self administered multiple choice questionnaire was completed by 121 registered and practical nurses. These nurses worked on the units from which the post surgical patients had been selected.

Of the patients in this Cohen study, 75.2 percent experienced marked or moderate distress due to pain. A general question was asked to see if pain relief was adequate postoperatively. In response, 79.8 percent

reported that relief was inadequate; 87.6 percent announced a return of pain before having received the next dose of analgesic. On the questionnaire, nurses generally selected the lowest in the range of doses available for analgesic administration even if that dosage might not produce relief of pain.

A study describing the influence of age on postoperative pain relief via analgesics was conducted in 1971 by Bellville, Forrest, Miller, and Brown. A convenience sample of 712 patients from 5 veteran hospitals was used. Only those patients requiring a potent analgesic were included in the study. The subjects received analgesics when they reported severe or moderate pain postoperatively. A nurse observer interviewed each patient postoperatively to determine the patient's evaluation of the intensity of pain and the relief gained, if any. Each patient was interviewed before the administration of analgesic and every 45 minutes thereafter in a total of seven interviews.

Of the variables considered in the Bellvile et al. study, age was the most important variable in determining the degree of pain relief afforded following the intramuscular administration of a potent analgesic. No differences were found in incidence of side effects reported by patients 58 and older and those reported by patients younger than 58.

In summary, the studies by Carr (1990); Dodd (1986); Cohen (1980); and Bellville, Forrest, Miller, and Brown (1971) indicate inadequate interpretation of postoperative patient's pain by nurses. While side effects are no more common in the elderly patient receiving potent analgesic, physicians consistently order less analgesic postoperatively and nurses administer lower doses, for the elderly. Consequently, the postoperative elderly patient could be unnecessarily experiencing moderate to severe pain.

Limitations of these studies include: no theoretical model and possible interview bias. In the study by Bellville et al. (1971), limitations might further include that 98 percent of the participants were male and that all of the hospitals were veteran hospitals. Thus, generalizability is limited.

This writer's 1993 study will give information about the types and amounts of postoperative analgesic prescribed by physicians and the amount of postoperative analgesic being administered by the nurses at one rural hospital (1990-1992). This study's information could strengthen the study by Faherty and Grier (1984).

Conceptual Framework

Lazarus's Theory of Stress and Coping and Erickson's Theory of Modeling/Role Modeling were the conceptual bases and guides for this research.

Lazarus's Theory of Stress and Coping was used to explain the impact and significance of pain on the patient's health and well being. While Erickson's Theory of Modeling/Role Modeling, discusses the nurse's role as each patient's advocate in the patient's attempt to attain adequate pain relief.

Lazarus's Theory of Stress and Coping

Lazarus examines stress from a psychosocial frame of reference. Important concepts within this theory pertinent to this study include: stress, situational factors, personal factors, coping, well-being, and resources.

Stress is defined as a transaction between the person and the environment seen as involving harm, threat, or challenge when the transaction is judged relevant to well-being and as taxing or exceeding the individual's sources of coping (Folkman, Lazarus, & Bernstein, 1987). The stress encountered by this writer's study patients was the experience of surgery. Situational factors are properties of events that make them stressful, for example, uncertainty or ambiguity. Part of the surgical experience is the uncertainty of its outcome. Personal factors are individual variations in appraisal based on knowledge or past experience, beliefs, commitments, values, and goals (Lazarus & Folkman, 1984). Each individual has a

unique background that influences interpretation of pain and hospitalization.

Coping is a means of managing stress. Coping, as defined by Lazarus, is a constantly changing cognitive and behavioral effort to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person (Lazarus & Folkman, 1984). Well-being is the opposite of being ill, and a resource. A resource is something one draws upon whether it is available in the form of money, tools, people, or skills or whether it exists as a competency for finding resources (Lazarus & Folkman, 1984). The nurse's goal in caring for the postoperative patient is to promote decreased pain. This goal may be accomplished by assessing each patient's coping resources and by then drawing upon those resources.

Lazarus's Theory of Stress Appraisal and Coping proposes a relationship between coping and psychological well-being and also proposes that differences in coping success are the result of changes in what people must cope with (Folkman et al., 1987). Assumptions within this theory are that the environment, the person, and the person's cognitive appraisal are constantly changing (Folkman et al., 1987) and that the goal of the patient is always to maintain integrity (Burckhardt, 1987). Consequently,

nurses must look at elderly patients' pain control needs on an individual basis.

Erickson's Theory of Modeling/Role Modeling

In accord with Lazarus's Theory of Stress Appraisal and Coping is the nursing theory of Helen Erickson, Modeling-Role Modeling. Part of this theory is that of Maslow's Hierarchy of Human Needs.

Other important concepts within Erickson's model and pertinent to this study are: modeling, role-modeling, health, holism, individual, adaptation, affiliated-individuation, unconditional acceptance, self care knowledge, and nursing.

According to Erickson, Tomlin, and Swain (1983), modeling is the act of imitating a standard or copying a representative of something. Modeling is the process the nurse uses while developing an image and understanding of what the patient's postoperative pain means to them. By shaping interventions to be purposeful, a process known as role-modeling develops. The nurse facilitates the individual in attaining, maintaining, or promoting health by relief of postoperative pain. Some examples of nursing interventions are: the administration of an analgesic; repositioning the patient; or teaching coping techniques. Accurate assessment of the patient's pain and quick intervention are needed to maintain a state of health.

Within Erickson's theory, health is defined as the state of physical, mental, and social well-being. Health is a holistic state of dynamic equilibrium among the various subsystems. Holism implies that the whole is greater than the sum of its parts. The body, mind, emotion, and spirit are a total unit and they act together. They affect and control one another interactively (Erickson, Tomlin & Swain, 1983). Consequently, a patient's pain may affect their ability to recover from surgery.

Each person is an unique individual, born with an inherent desire to fulfill self potential. The nurse needs to accept each patient's uniqueness. The nurse must also recognize each patient as being always in a state of continuous movement or change known as adaptation. Adaptation will be essential for each patient confronted with the stressors associated with surgery. Adaptation involves mobilizing internal and external coping resources.

To maintain a state of health, an individual has an instinctual need to be dependent on support systems while simultaneously maintaining independence from those support systems; this process is known as affiliated-individuation. The nurse plays a key role as a support for the patient. The postoperative elder's usual support systems may not be available because of hospitalization; because of the inability

of an elder spouse to visit; or because other family members are geographically too distant. In addition, the nurse needs to accept unconditionally each patient as being unique, worthwhile, and important.

Within Erickson's model, nursing is an interactive, interpersonal process. It nurtures the patient's strength to enable the patient to develop, and releases and channels resources for coping with one's circumstances and environment. It is a holistic helping of the patient with selfcare activities in relation to health (Erickson, Tomlin, & Swain, 1983). In order to maintain a state of health, self care knowledge is needed. Such knowledge is evident when a person at some level knows what has caused the illness, lessened effectiveness, or interfered with growth. The person also knows what will restore health, optimize effectiveness, or promote growth. Within Erickson's model, the patient's needs are prioritized using Maslow's Hierarchy of Human Needs.

Maslow's Hierarchy of Human Needs

Maslow assigned priorities to basic human needs. Physiologic needs (oxygen, fluid, nutrition, temperature, elimination, shelter, rest, and sex) have the highest priority). An individual who has several unmet needs generally seeks first to fulfill physiological needs (Maslow, 1970). Consequently, an unmet basic need such as pain relief could interfere

with holistic growth; in contrast, the satisfied need, e.g., pain relief, could promote holistic growth. Physiological and psychological needs on the lower levels of Maslow's hierarchy of human needs must be satisfied to some degree before higher level needs emerge (Erickson, et al, 1983). The degree to which developmental tasks can be resolved by a patient could be dependent on the degree to which pain relief needs are first satisfied.

In summary, the appropriate administration of analgesic to the postoperative elder patient is a crucial role-modeling, nursing responsibility. Each elder patient's unique pain, should be unconditionally accepted by the nurse. Each patient is attempting to cope with and adapt to the postoperative situation; each patient is attempting to attain a sense of functional well-being and quality of life. Within that process, the patient will evidence an instinctual need to be dependent on support systems while simultaneously maintaining independence from those support systems (affiliated-individuation).

Nursing is a key support system to the patient postoperatively due to the nurse's proximity to the patient. Nursing should nurture strength to enable coping. Nursing, by developing an understanding of the patient's pain through subjective and objective assessment, prioritizes unmet needs, and provides

treatment insight. In collaboration with the patient and the physician, the nurse can promote a state of health through optimum pain management. In addition, the nurse's administration of analgesic could promote pain relief that would maximize physical movement and minimize complications.

Unfortunately, review of the literature concerning analgesia for the elder postoperative patient indicates that nurses as a patient resource, do not appear adequately to promote appropriate pain relief for the postoperative elder.

This writer's study reports the current analgesics being prescribed and administered to postoperative adult patients in the first 48 hours. This study provides the postoperative surgical nurse with a broader knowledge with which to plan more appropriate postoperative pain relief for the elder patient.

Hypotheses

By reviewing the charts for the postoperative analgesic ordered and the actual amount administered to adult patients with abdominal surgery in the first 48 hours, the following hypotheses were explored:

1) As age increases from 25 years, less analgesic medication is prescribed during the first 24 hours following surgery.

2) As age increases from 25 years, less

analgesic medication is prescribed during the second 24 hours following surgery.

3) As age increases from 25 years, less analgesic medication is administered in the first 24 hours following surgery.

4) As age increases from 25 years, less analgesic medication is administered in the second 24 hours following surgery.

CHAPTER 3

METHODOLOGY

This retrospective study of postsurgical adult patients' charts for the years 1990, 1991, and 1992 at a rural hospital was done to determine if patients received less analgesic during the first 48 hours following abdominal surgery as age increased. The independent variable was age; the dependent variables were the amount of analgesia prescribed and the actual amount administered.

Research Design

An ex post facto correlational design was used in this study. Since patients' charts were used for data collection, no manipulation of the variables occurred. That is, the relationship of age and analgesic were examined without any active intervention on the part of the researcher.

Sample and Setting

The research was conducted at an 142 bed, community, teaching hospital located in a small midwestern town. Criteria used to identify subject patients for this study were: The patient must have had abdominal surgery under general anesthesia (this study excluded any who had had only an appendectomy and any who had had laser surgery); the postoperative

hospital period must have been a minimum of 48 hours: and the patient must have received analgesics postoperatively in injectable or oral form. The analgesic given needed to necessitate a decision by the nurse as to time given and/or the amount administered. Thus, excluded patients were also those who had used patient controlled analgesia (PCA) pumps, those who had epidural pain medication, and those who had received ketorolac (Toradol) routinely postoperatively.

A total of 937 patients, 25 years and older, had had abdominal surgery under general anesthesia within the three-year period. The study subjects originally were to have been stratified on gender into seven, 10 year age groupings: 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85-94. Within each group, 10 males and 10 females were to have been selected. The total number of subjects was to have been 140. Unfortunately, not enough male patients within each age group met the criteria so as to allow adequate statistical power. Consequently, all of the 253 postoperative male patients were excluded from this study.

Of the remaining 684 postoperative female patients, 349 were excluded from this study because they had had physician orders for routine administration of ketorolac (Toradol) and/or PCA pumps. Additionally, 152 female patients were

excluded from this study because the amount of analgesic administered had not been specified or had not been recorded properly. Other exclusions included: Seven female patients whose abdominal surgeries had been laparascopic cholecystectomies; six whose height or weight had not been recorded; five who had not been in the hospital for 48 hours; and one patient who had been on pancuronium bromide (Pavulon), a neuromuscular blocking agent and who thus had had no way of communicating the need for analgesia. And, finally, two patients were excluded as these patients' charts were then unavailable for review.

Thus from the 684 postoperative female patients, a convenience sample of 163 females was formed. Two of these subjects were excluded because the medications ordered for them postoperatively had no morphine equivalency documented in available references. The drug companies have been contacted for information on morphine equivalency conversions for indomethacin (Indocin) and diclofenac sodium (Voltaren).

Of the 161 available subjects: 26 were in the 25-34 age group; 35 in the 35-44 age group; 32 in the 45-54 age group; 17 in the 55-64 age group; 25 in the 65-74 age group; and 26 in the 75 years and older group. The categories of the primary diagnosis for these subjects are listed in Table 1. The surgeries

Table 1

Primary Diagnosis of Six Age Groups

Primary Diagnosis	Age groups 25–34 (n=26)	35–44 (n=35)	45–54 (n=32)	55–64 (n=17)	65–74 (n=25)	75+ (n=26)
Abdominal distention					1	
AAA						1
Acute abdomen					1	1
Abdominal mass	2	2	2	1		2
Appendicitis	1	1				
Bleeding	3	11	7	1	3	3
Bowel obstruct						2
Cancer	4	3	2	1	4	7
Cystocele			1			
Diverticulitis					1	
Endometriosis	1	1				
Fistula					1	1
GB disease	8	8	3	5	9	3
Incontinence				1		
Ovarian disease	2	2			1	3
Pancreatitis						1
PID	2	1	1	1		
Uterus fibroid	2	7	12	3	3	
Ventral hernia	1	1	3	3	1	2

AAA = Abdominal Aortic Aneurysm
GB = Gallbladder
PID = Pelvic Inflammatory Disease

performed on these subjects are listed in Table 2.

Table 2

Primary Surgeries of Six Age Groups

Primary Surgeries	Age groups 25-34 (n=26)	35-44 (n=35)	45-54 (n=32)	55-64 (n=17)	65-74 (n=25)	75+ (n=26)
Anastamosis					1	1
Antrectomy					1	
Bowel resection				1	5	6
Cholecystectomy	8	7	3	5	8	4
Colostomy						1
Cystectomy					1	3
Exp laparotomy	4	2	2	1	3	5
Hernia repair	1	1	3	2	1	2
Removal of CA of abd cavity		1				
Repair abdominal aortic aneurysm						1
Suture large bowel laceration					1	
Total abdominal hysterectomy	11	23	22	6	4	3
Tubal ligation		1				
Oophorectomy	2		2	1		
Urethropexy				1		

Instrument

The chart review instrument used (Appendix A) was similar to Faherty and Grier's (1984). The following data were collected from each chart:

1. The patient's height and the last preoperative weight recorded.
2. The surgical procedure.
3. The time surgery ended.
4. The name of the analgesic, dose, route of administration, date, and time prescribed for the 48 hour postoperative period, including time in the recovery room.
5. The name of the analgesic, dose, route of administration, date, and time administered within the first 48 postoperative hours, including time in the recovery room.

Procedures

Permission to conduct the study was obtained from the research committee at the hospital and from the Institutional Review Board at Grand Valley State University. After permission was received, the subjects' charts were reviewed, and data were collected using the chart review instrument (Appendix A).

Confidentiality was maintained for the study participants by removing all identifying descriptors

upon receipt of the information. Only a numerical identification code, kept separate from the data and destroyed on completion of data analysis, was used.

After all information had been collected, all data used in this study were validated by second check. All doses of analgesic were then converted to equinalgesic doses of morphine. This conversion table was derived from Tables 11.3 and 11.9 in McCaffery (1979, pp. 192 and 233), Facts and Comparisons (1990, February, 242a), The Medical Letter (1993, Vol. 35, Issue 887, pp. 1-5), and Beaver and Feise (1976, p. 557). Conversion to morphine was done because morphine is the standard to which other narcotic analgesics are compared (Jaffee & Martin, 1975; McCaffery, 1979).

A variety of narcotics and nonnarcotics were prescribed for pain relief for the 161 subjects in this study (Appendix B). Recent literature states that the concurrent use of opioid and nonsteroidal anti-inflammatory drugs often provides more effective analgesia than either of the drug classes alone (Acute Pain Management, 1992).

A large variety of nonnarcotics were prescribed and administered for the subjects of this study. Because of this, all postoperative analgesic prescribed (narcotic and nonnarcotic) for each subject, were used to compute the total amount of

analgesia possible to be given. For example, one of the nonnarcotics used frequently for subjects of this study was hydroxyzine hydrochloride (Vistaril). The use of hydroxyzine hydrochloride (Vistaril) as a means of potentiating the action of central nervous system (CNS) depressants such as narcotics and barbiturates has been documented. The dosage needed of narcotics and barbiturates can be reduced up to 50 percent when used concurrently with Vistaril (Reiss & Melick, 1987; Malseed, 1982). In addition, Spencer et al. (1986) described Vistaril as a peperazine derivative antihistamine that may be used as an antiemetic, antipruritic, tranquilizer, or sedative. Malseed (1986) speaks of Vistaril as a diphenylmethan derivative having a mild central nervous system action, together with anticholinergic, antihistamine, local anesthetic, antiemetic, antispasmodic, antisecretory, and skeletal muscle relaxant effect.

Hydroxyzine hydrochloride (Vistaril) had been prescribed and administered postoperatively to 107 of the 161 subjects of this writer's study. To include Vistaril as a part of the total amounts received by each subject, an equinalgesic dosage was needed. Beaver and Feise (1976) stated that hydroxyzine hydrochloride (Vistaril) 100 milligrams intramuscularly is approximately equal with eight

milligrams of morphine intramuscularly. Consequently, this was the conversion used in this study.

The first 48 postoperative hours were measured from the end of the surgery time recorded on the operating room record in the subject's hospital record. Usually a range of dose and a range of time between doses had been prescribed. For each subject, the total amount of doses prescribed and administered for the first 24 postoperative hours and for the second 24 postoperative hours was calculated.

The medications prescribed for each subject were converted to equinalgesic doses of morphine sulfate (Appendix B). In order to compare the amounts of analgesics prescribed for the 161 subjects, the greatest number of times a narcotic dose could be given in a 24 hour period was multiplied by the largest dose prescribed for the subject; the least number of times the narcotic dose could be given in a 24 hour period was multiplied by the smallest amount dose prescribed for each subject. These two totals were added together and divided by 2 to obtain the mean narcotic doses prescribed. The nonnarcotic mean was figured in the same manner. The means of the narcotic and nonnarcotic doses were added together for the average dose of analgesic prescribed for a 24 hour period. This average was used to calculate the

prescribed medication available to the subjects within the first and second 24 hours.

The body surface area (BSA) was used as a covariate with analgesic prescribed and administered because body surface area has been shown to be a useful measure of appropriate dosage (Reiss & Melick, 1987). Reiss and Melick (1987) calculate body surface area from a nomogram or use the formula S = W 0.425 x H 0.725 x 71.84 (S = body surface in cm^2. W = weight in kg, H = height in cm).

Summary

This study, done via hospital record review, examined the relationship of patient age to amount of analgesic prescribed and administered postoperatively. A convenience sample of 161 postoperative female subjects was studied. The procedures for sample selection and data collection are outlined within this study. The conversion and computing of analgesic dosage amounts are discussed.

CHAPTER 4

RESULTS

Data obtained in this study were examined in two ways: (a) The relationship of age and amounts of analgesic prescribed and administered for the first and second 24 hour periods and (b) the comparison of the amount of analgesic prescribed versus the amount of analgesic administered for the first and second 24 hour periods for each age group.

Postoperative Analgesics Prescribed and Administered

Table 3 shows the means and standard deviations of analgesic prescribed for the first and second 24 hours. Table 4 shows the means and standard deviations for the amount of analgesic administered the first and second 24 hour periods. Obtained means in tables 3 and 4 are based on the raw score; while the adjusted means are calculated after adjusting the scores on the dependent variable to eliminate the effect of the covariate.

Hypotheses One and Two

Analysis of covariance (ANCOVA) was performed to test hypotheses one and two: With increasing age from 25 years, less analgesic is prescribed during the first 24 hours (hypothesis one) and the second 24 hours (hypothesis two). Body surface area was used as

Table 3

Means and Standard Deviations of Amount of Postoperative Analgesic Prescribed for Six Age Groups

	Age groups					
Total Amount Prescribed	25-34 (n=26)	35-44 (n=35)	45-54 (n=32)	55-64 (n=17)	65-74 (n=25)	75+ (n=26)
First 24 Hours						
Mean						
Obtained	87.04	85.74	81.96	83.95	91.54	86.05
Adjusted	87.03	85.12	81.73	83.11	91.86	87.42
Standard Deviation	16.80	11.24	13.78	18.58	15.99	18.72
Second 24 Hours						
Mean						
Obtained	78.05	80.56	75.24	76.50	79.82	80.37
Adjusted	78.04	79.91	75.00	75.62	80.16	81.79
Standard Deviation	12.07	10.34	12.58	18.55	13.82	19.83

a covariate. The results of ANCOVA indicated no significant differences in the mean amount of analgesic prescribed among the 6 age groups during the first and second 24 hours ($p > .05$) (see Table 5). Therefore, hypotheses one and two were not supported. The mean amount of analgesic prescribed for the first

Table 4

Means and Standard Deviations of Amount of Postoperative Analgesic Administered for Six Age Groups

Total Amount Administered	Age groups 25-34 (n=26)	35-44 (n=35)	45-54 (n=32)	55-64 (n=17)	65-74 (n=25)	75+ (n=26)
First 24 Hours						
Mean						
Obtained	68.28	56.42	55.99	44.07	46.39	43.08
Adjusted	68.27	55.88	55.79	43.34	46.67	44.25
Standard Deviation	21.17	20.07	20.14	17.56	15.60	17.18
Second 24 Hours						
Mean						
Obtained	32.03	24.10	27.07	18.52	25.21	30.17
Adjusted	32.02	23.73	26.93	18.02	25.39	30.97
Standard Deviation	19.79	21.90	17.31	21.14	23.01	17.78

and second 24 hours after surgery did not decrease as age increased. Body surface area was found to be a significant covariate for the amount of analgesic prescribed the second 24 hours ($p < .05$), but not for

Table 5

ANCOVA for Amount of Postoperative Analgesic Prescribed among Six Groups with Body Surface Area as Covariate

Source of Variation	df	MS	F	p^*
First 24 Hours				
Between Groups	5	329.80	1.38	.118
Covariate	1	507.08	2.12	.074
Within Groups	154	239.62		
Second 24 Hours				
Between Groups	5	185.20	.91	.238
Covariate	1	594.98	2.93	.045
Within Groups	154	203.11		

Note. * One-tailed test.

the amount prescribed the first 24 hours ($p > .05$).

Hypotheses Three and Four

Analysis of covariance (ANCOVA) was used to test hypotheses three and four: With increasing age, less analgesic is administered during the first 24 hours after surgery (hypothesis 3) and the second 24 hours after surgery (hypothesis 4). Body surface area was used as a covariate (see Table 6). The test for

Table 6

ANCOVA for Amount of Postoperative Analgesic Administered among Six Groups with Body Surface Area as Covariate

Source of Variation	df	MS	F	p*
First 24 Hours				
Between Groups	5	2211.12	6.18	.000
Covariate	1	1273.30	3.56	.032
Within Groups	154	357.57		
Second 24 Hours				
Between Groups	5	542.48	1.33	.128
Covariate	1	33.13	.08	.388
Within Groups	154	408.31		

Note. * One-tailed test.

hypothesis three was significant at the .05 level. Hypothesis three was supported; as age increased from 25 years, less analgesic was administered for the first 24 hours. A post hoc Scheffe' analysis was performed to test the differences in the amount administered among groups in the first 24 hour period (Table 7). A significant difference occurred between group 1 (25-34 years) and groups 4 (55-64 years), 5

Table 7

Multiple Comparison of Six Age Groups for the Amount of Postoperative Analgesic Prescribed the First Twenty-Four Hours by post hoc Scheffe' Analysis

		Age group					
Age Group	M	25-34 (n=26)	35-44 (n=35)	45-54 (n=32)	55-64 (n=17)	65-74 (n=25)	75+ (n=26)
25-34 (n=26)	68.28				*	*	*
35-44 (n=35)	56.42						
45-54 (n=32)	55.99						
55-64 (n=17)	44.07						
65-74 (n=25)	46.39						
75 + (n=26)	43.08						

Note. * Significant at the .05 level.

(65-74 years), and 6 (75+ years) at the .05 level.

group 1 (25-34 years) and groups 4 (55-64 years), 5 (65-74 years), and 6 (75+ years) at the .05 level. Hypothesis four was not supported. In the second 24 hour period, the difference between groups for the amount of analgesic administered was not significant

at the .05 level. Body surface area was found to be a significant covariate for hypothesis three ($p < .05$), but not for hypothesis four ($p > .05$).

In addition to the testing of the hypotheses, a paired t test was performed to examine the difference between the amounts of analgesic prescribed and the amounts of analgesic administered within each age group. For each group, significantly less analgesic was administered than was prescribed during the 48 hours postoperatively (see Table 8). Further study of this relationship with patient age was done by comparing the amount administered as a percent of the amount prescribed according to age during the 48 hour postoperative period. Of 161 subjects, 87 (54%) received less than 50 percent of the dose prescribed. Of 93 subjects, ages 25 to 54, 37 (39.8%) received less than 50 percent of the dose prescribed. Of 68 subjects, ages 55 and older, 44 (64.7%) received less than 50 percent of the dose prescribed.

Other Findings of Interest

In testing the hypotheses, body surface area (BSA) was used as a covariate because dosage of analgesics is related to this parameter (Reiss & Melick, 1987). The means and standard deviations of BSA of the 6 age groups are shown in Table 9.
For all subjects ages 25 and older ($N = 161$), body surface area was negatively correlated with age

Table 8

Differences in Amount of Postoperative Analgesics Prescribed and Administered

Age group	n	Prescribed M	Prescribed SD	Administered M	Administered SD	t
First 24 Hours						
25–34	26	87.04	16.80	68.28	21.17	6.20*
35–44	35	85.74	11.24	56.42	20.07	9.96*
45–54	32	81.96	13.78	55.99	20.14	7.37*
55–64	17	83.95	18.58	44.07	17.56	7.21*
65–74	25	91.54	15.99	46.39	15.60	10.88*
75 +	26	86.05	18.72	43.08	17.18	10.96*
Second 24 Hours						
25–34	26	78.05	12.07	32.03	19.79	12.37*
35–44	35	80.56	10.34	24.10	21.90	17.46*
45–54	32	75.24	12.58	27.07	17.31	14.60*
55–64	17	76.50	18.55	18.52	21.14	8.62*
65–74	25	79.82	13.82	25.21	23.01	12.75*
75 +	26	80.37	19.83	30.17	17.78	12.49*

Note. * $p < .0001$.

($r = -.23$, $P < .005$). The results of analyses of covariance performed to test hypotheses indicated that BSA was a significant covariate for hypotheses two and

Table 9

Means and Standard Deviations of Body Surface Area for Six Age Groups

	Body surface area (in cm^2)	
Age Group	M	SD
25–34 (n=26)	270870.15	76121.41
35–44 (n=35)	289575.92	70279.07
45–54 (n=32)	277573.50	59795.81
55–64 (n=17)	296232.19	101772.60
65–74 (n=25)	260661.95	55104.09
75 + (n=26)	228544.33	44997.40

three, but not for hypotheses one and four (Tables 5 and 6).

Fourteen different analgesics were prescribed. Two subjects were excluded because their analgesics (Voltaren and Indocin) had no documented equivalency; thus, those analgesics were not included. All 161 subjects had analgesia prescribed postoperatively, and all had at least one analgesic administered. The

narcotics and nonnarcotics first prescribed and their frequency by route of administration are listed in Table 10. Meperidine (Demerol) intravenous was the ne

Table 10

Frequency of First Analgesic Medication and Route Prescribed for One-Hundred-Sixty-One Post Abdominal Surgical Patients

	Frequency by route of administration			
Drug	IV	IM	PO	Total
First Narcotic Ordered				
Demerol	148	9	0	157
Morphine	0	1	0	1
Tylenol #3	0	0	1	1
Darvocet N 100	0	0	2	2
First Nonnarcotic Ordered				
Aspirin	0	0	1	1
Equagesic	0	0	13	13
Toradol	0	1	0	1
Tylenol	0	0	54	54
Tylenol ES	0	0	1	1
Vistaril	0	77	0	77

Note. IV = intravenous, IM = intramuscular, PO = orally.

most frequently first narcotic; hydroxyzine hydrochloride (Vistaril) intramuscularly was the most frequently prescribed nonnarcotic, followed by Tylenol orally.

Tables 11 and 12 show the mean, the minimum and maximum doses prescribed for each age group for the first and second 24 hour periods. Also, displayed are the ranges of maximums and ranges of minimum doses prescribed for each age group.

Summary

Data obtained in this study were analyzed in three major phases: examination of the relationship of age and the amounts of analgesic prescribed and administered; examination of significant differences between amounts of analgesic prescribed and administered among the 6 age groups; and examination of the relationship of patient body surface area to age, amount of analgesic prescribed, and the amount administered.

Analysis of covariance (ANCOVA) was used to test hypotheses one, two, three, and four. Hypotheses one, two, and four were not supported. Hypothesis three was supported; as age increased from 25 years, less analgesic was given in the first 24 hours.
A post hoc Scheffe' analysis indicated a significant difference in the amount of analgesic administered in the first 24 hours between group 1 (25-34 years) and

Table 11

<u>Mean Amount of Maximum and Minimum Equinalgesic Medication Prescribed During the First Twenty-Four Hours According to Six Age Groups</u>

	Age Groups					
	1	2	3	4	5	6
Analgesic Prescribed	25-34 (n=26)	35-44 (n=35)	45-54 (n=32)	55-64 (n=17)	65-74 (n=25)	75+ (n=26)
<u>Narcotic</u> (mg)						
Maximum Amount	94.4 (46.7-120.7)	89.7 (60-113.3)	92.2 (53.3-113.3)	84.9 (53.3-106.7)	96.0 (53.3-113.4)	89.6 (53.3-113)
Minimum Amount	47.9 (18.4-76.6)	49.8 (18.4-80)	48.2 (18.4-80)	48.8 (16-70)	38.4 (18.4-64)	39.2 (18.4-64)
<u>Nonnarcotic</u> (mg)						
Maximum Amount	17.4 (0-32)	17.9 (0-32)	16.7 (0-32)	17.9 (0-32)	25.3 (0-32)	23.2 (0-32)
Minimum Amount	14.4 (0-32)	14.1 (0-32)	12.2 (0-32)	16.3 (0-32)	23.3 (0-32)	20.0 (0-32)

<u>Note</u>. The numbers in parenthesis under narcotic and nonnarcotic are the ranges of equinalgesic doses for each age group.
Group 1 had four subjects with no nonnarcotics prescribed. Groups 2 and 6 had three subjects with no nonnarcotics prescribed. Groups 3, 4, and 5 had two subjects with no nonnarcotics prescribed.

Table 12

Mean Amount of Maximum and Minimum Equinalgesic Medication Prescribed During the Second Twenty-Four Hours According to Six Age Groups

	Age Groups					
	1	2	3	4	5	6
Analgesic Prescribed	25-34 (n=26)	35-44 (n=35)	45-54 (n=32)	55-64 (n=17)	65-74 (n=25)	75+ (n=26)
Narcotic (mg)						
Maximum Amount	91.3 (40-106.7)	85.0 (53.3-106.7)	83.0 (53.3-106.7)	81.2 (53.3-106.7)	92.4 (40-106.7)	86.0 (26.7-106.7)
Minimum Amount	38.0 (13.8-80)	46.7 (18.4-80)	43.4 (12.8-60)	42.3 (12.8-80)	28.3 (16-60)	34.8 (18.4-64)
Nonnarcotic (mg)						
Maximum Amount	17.4 (0-32)	18.9 (0-32)	16.8 (0-32)	17.9 (0-32)	25.8 (0-45.6)	23.2 (0-32)
Minimum Amount	9.4 (0-32)	10.5 (0-32)	9.0 (0-32)	11.6 (0-32)	13.2 (0-32)	16.7 (0-32)

Note. The numbers in parenthesis under narcotic and nonnarcotic are the ranges of equinalgesic doses for each age group.
Group 1 had four subjects with no nonnarcotics prescribed. Groups 6 had three subjects with no nonnarcotics prescribed. Groups 2, 3, 4, and 5 had two subjects with no nonnarcotics prescribed.

groups 4 (55-64 years), 5 (65-74 years), and 6 (75+years). A paired t test revealed, in each group, significantly less analgesic was administered than was prescribed ($p < .05$). Body surface area was negatively correlated with age. That is, the younger the subject, the greater the body surface area. ANCOVA revealed that the body surface area was a significant covariate of the amount of analgesic prescribed the second 24 hours and administered the first 24 hours.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Based on the results of this study, these conclusions were formulated:

1. As age increased from 25 years, the mean amount of analgesic prescribed was not different during the first or second 24 hour period postoperatively.

2. As age increased from 25 years, significantly less analgesic was administered during the first 24 hour period postoperatively ($p < .05$). A significant difference occurred between group 1 (25-34 years) and groups 4 (55-64 years), 5 (65-74 years), and 6 (75+ years) at the .05 level.

3. As age increased from 25 years. the amount of analgesic administered was not different during the second 24 hour period postoperatively ($p > .05$).

4. Body surface area was negatively correlated with age. As age increased, body surface area decreased. In addition, body surface area was found to be a significant covariate with age for the amount of analgesic prescribed the second 24 hours and the amount administered the first 24 hours.

Discussion

McCaffery (1985) states that the elderly are given lower doses of analgesic when, in fact, what they need is the same dose as other adults, only administered less frequently. Other studies show that elderly patients experience moderate to severe levels of pain postoperatively (Ketovuori, 1987; McCaffery & Hart, 1976; Short, Burnett, Egbert, & Parks, 1990). This writer's study supported McCaffery's (1985) findings; less analgesic was administered to the older patients during the first 24 hour period, but not during the second 24 hour period. In fact, for the first 24 hour period a significant difference was observed in the amount administered to the youngest group (25-35 years) versus the amounts administered to the three older groups (55 years or older).

Faherty and Grier's (1984) study results suggested that the smaller amounts of analgesic administered to the older patients may have been influenced by the smaller amounts prescribed. The findings of this writer's study were not consistent with their findings.

Smaller amounts of analgesic were not prescribed for the older subjects of this writer's study. Interesting, however, is the observation that, in spite of no differences in amount of postoperative

analgesic prescribed for the age groups, nurses administered smaller amounts of the analgesic to the older groups compared to the youngest group.

Additionally, the findings of this writer's study differed from Faherty and Grier's (1984) in another way. In this study, body surface area was found to be a significant covariate for the amount of medication prescribed in the second 24 hour period and the amount administered in the first 24 hour period. Faherty and Grier (1984) did not find weight to be a significant covariate.

Differences in the findings may exist because this study included only females, because a sample of convenience was used, and because the analgesics prescribed and administered included both narcotics and nonnarcotics. In the study by Faherty and Grier (1984), an equal number of males and females was randomly selected. In the Faherty et al. study (1992), six different analgesics were prescribed, whereas fourteen different analgesics were prescribed in this writer's study. In addition, all nonnarcotics prescribed in this writer's study were used to compute the amount of analgesic possible. The only nonnarcotic Faherty and Grier (1984) included was hydroxyzine hydrochloride (Vistaril).

Weaknesses of this study included: limited sample size; ex post facto research providing no

manipulation of the variables; use of a sample of convenience; and all subjects female. Two major sources of bias in existing records are selective deposit and selective survival (Polit & Hungler, 1987). This writer was not responsible for the recording of the information in the chart. Every effort was made to obtain the cleanest record. Because ex post facto research was used to collect data, the level of pain experienced by any subject is not known. This type of study could be strengthened by a patient survey about the pain each subject patient actually experiences.

Implications for Nursing

Lazarus's Theory of Stress and Coping defines stress as a transaction between the person and the environment seen as involving harm, threat, or challenge when the transaction is judged relevant to well-being. However, the older patients (55+) in this writer's study received less analgesic than much younger patients. Thus, the elderly patients may experience more pain-related stress. The elderly, in particular, come to the postoperative period with more need for pain relief due to existing chronic conditions. The fact that 39.8 percent of subjects, ages 25 to 54, received less than 50 percent of the analgesia prescribed versus 64.7 percent of subjects 55 and older, supports results from other studies that

suggest elderly patients are undermedicated postoperatively and may be in pain.

Erickson's Theory of Modeling/Role Modeling states the nurse's responsibility to the patient is to nurture strength, to release and to channel resources for coping with one's circumstances and environment. This writer's study found that greater than 50 percent of the patients received less than half of the medication prescribed. This concurred with Faherty and Grier's (1984) study. Thus, nurses are apparently missing an opportunity to nurture strength and coping.

Nurses need improved education concerning pain management for the postoperative patient. Ways to accomplish this education might be through inservices. Information from the Acute Pain Management Guidelines (1992) on the concurrent use of NSAIDS and opioids to promote pain relief would enhance the nurse's knowledge. Other programs could include improved patient's preoperative education; an improved understanding between the nurse and the patient about who should initiate the request for postoperative pain medications; and improved student nurse education about pain relief and the aging process.

Although, in this study, no significant difference occurred between the groups for the amounts of analgesic prescribed postoperatively, physician's prescriptions for analgesics at routine times rather

than an "as needed" basis might enhance pain control for patients.

Literature supports the fact that delays in obtaining medications can often make pain worse. Consequently, this study also lends support for the need to increase the use of patient controlled analgesia (PCA). This method of analgesic administration would not only give the patient control in administering medication as needed, but would also eliminate the need to wait to communicate the information about the pain to the nurse. In addition, PCA would possibly eliminate an incorrect interpretation of the amount of medication needed and the wait while the medication is being prepared.

Recommendations for Further Study

This study supports the need for more research on postoperative pain relief in different settings, with a variety of subjects and a variety of types of surgical pain experiences. Additional research involving analgesics for the elderly needs to be done. The amount of analgesic administered during the first 24 hours of this study decreased as age increased ($p < .05$). In addition, a significant difference was noted in the amount of analgesic administered, between group 1 (ages 25-34) and groups 4 (ages 55-64), 5 (ages 65-74), and 6 (ages 75+) at the .01 level. The patient's input concerning pain, the relief obtained,

and individual coping abilities would also be important areas for study.

A study of nurses' perceptions about pain control and pain relief would be very beneficial; how do nurses make their decisions on the kinds, the amounts, and the frequency of analgesics for postoperative patients. A study of pain control education in schools of nursing, of how that information is presented, and of how the critical thinking skills are developed to prepare students for their patient advocate roles would also be important.

APPENDICIES

Appendix A

Chart Review Instrument

Date________ Time______

A. Demographic Data

Patient #______ Gender_____ Age______ Group_______

Ht. ______ in Wt. ______ lb

Diagnosis____

Surgery____

B. Analgesics

Narcotic Analgesics Prescribed:

Drug ordered______________dose_______frequency________

Total amount possible for 24 hours_________________

Drug ordered______________dose_______frequency________

Total amount possible for 24 hours_________________

Drug ordered______________dose_______frequency________

Total amount possible for 24 hours_________________

Drug ordered______________dose_______frequency________

Total amount possible for 24 hours_________________

Drug ordered______________dose_______frequency________

Total amount possible for 24 hours_________________

Nonnarcotic Analgesics Prescribed:

Drug ordered______________dose_______frequency________

Total amount possible for 24 hours_________________

Drug ordered______________dose_______frequency________

Total amount possible for 24 hours_________________

C. Analgesia Administered

First 24 hours postoperatively:

1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.

Second 24 hours postoperatively.

1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.

Related Drugs (sedatives, tranquilizers, etc.)

Drug ordered______________ Given: 1.

2.

Appendix B

Conversions of Analgesic Medications to Equivalents of Morphine Sulfate

Analgesics	Dose		Parenteral Equivalents of Morphine Sulfate
Acetaminophen (Tylenol)	325 mg PO	=	0.9 mg
Acetaminophen (Tylenol ES)	500 mg PO	=	1.3 mg
Acetaminophen 650 mg with propoxyphene Napsylate 100 mg (Darvocet N 100)	1 oral tab	=	3.2 mg
Acetaminophen 300 mg with Codeine 30 mg (Tylenol #3)	1 oral tab	=	2.3 mg
Acetaminophen 650 mg with propoxyphene HCL 65 mg (Wygesic)	1 oral tab	=	3.2 mg
Aspirin (ASA)	325 mg PO	=	0.9 mg
ASA 325 mg with Meprobamate 200 mg, (Equagesic)	1 oral tab	=	0.8 mg
Butorphanol (Stadol)	1.5 mg IM, IV	=	10.0 mg
Hydromorphone (Dilaudid)	1.5 mg IM	=	10.0 mg
Hydroxyzine (Vistaril)	25 mg IM	=	2.0 mg
Ibuprofen (Motrin)	200 mg PO	=	1.7 mg
Ketorolac (Toradol)	30 mg IM	=	12.0 mg
Meperidine (Demerol)	75 mg IM, IV	=	10.0 mg
Morphine	10 mg IM, IV	=	10.0 mg

Derived from Tables 11.3 and 11.9 in McCaffery (1979, pp. 192 and 233), 242a in Facts and Comparisons (1990, February), Vol. 35 (Issue 887) The Medical Letter (1993, pp. 1–5), and Beaver and Feise (1976, p. 557).

REFERENCES

References

Acute Pain Management Guideline Panel (1992). Acute pain management: Operative or medical procedures and trauma. Clinical Practice Guideline. (AHCPR Pub. 92-0032). Rockville, MD: Agency for Health Care Policy and Research.

Beaver, W. T., & Feise, G. A. (1976). Comparison of the analgesic effects of morphine, hydroxine, and their combination in patients with postoperative pain. Advances in Pain Research and Therapy. New York, Ravens Press.

Bellville, J. W., Forrest, W. H., Miller, E., & Brown, B. W. (1971). Influence of age on pain relief from analgesics. Journal of American Medical Association, 217, 1835-1841.

Binks, F. A. (1974). Geriatric pain. Physical Therapy, 60, 132-133.

Burckhardt, C. S. (1987). Coping strategies of the chronically ill. Nursing Clinics of North America, 22, 543-550.

Campbell, J., Finch, D., Allport, C., Erickson, H. C., & Swain, M. A. P. (1985). A theoretical approach to nursing assessment. Journal of Advanced Nursing, 10, 111-115.

Carnevali, D. L., & Patrick, M. (1986). Nursing management for the elderly. Philadelphia: J. B. Lippincott Company.

Carr, E. C. J. (1990). Postoperative pain: Patients' expectations and experiences. Journal of Advanced Nursing, 15, 89-100.

Cohen, F. L. (1980). Postsurgical pain relief: Patients' status and nurses' medication choices. Pain, 9, 265-274.

Dodd, J. (1986). Nursing evaluation of the efficacy of analgesic delivery in post operative pain. Australian Clinical Review, 6, 206-12.

Donley, R. (1988). Building nursing's platform for the long-term care debate. Nursing & Health Care, 6, 303-305.

Donovan, M. (1987). Pain control. Nursing Clinics of North America, 22, 645-648.

Eland, J. M. (1988). Pain management and comfort. Journal of Gerontological Nursing, 14, 10-15.

Erickson, H. C., Tomlin, E. M., & Swain, M. A. P. (1983). Modeling and role-modeling: A theory and paradigm for nursing. Englewood Cliffs, NJ: Prentice-Hall.

Facts and comparisons. (1990). St. Louis: Kluwer Company.

Faherty, B. S., & Grier, M. R. (1984). Analgesic medication for elderly people post-surgery.

Nursing Research, 33, 369-372.

Ferrell, B. R., & Ferrell, B. A. (1990). Easing the pain. Geriatric Nursing, 11, 175-178.

Folkman, S., Lazarus, R. S., & Bernstein, L. (1987). Stress processes and the misuse of drugs in older adults. Psychology and Aging, 2, 366-374.

Harrison, M., & Cotanch, P. H. (1987). Pain: Advances and issues in critical care. Nursing Clinics of North America, 22, 691-697.

Herr, K. A., & Mobily, P. R. (1991). Complexities of pain assessment in the elderly. Journal of Gerontological Nursing, 17, 12-19.

Ketovuori, H. (1987). Nurses' and patients' conceptions of wound pain and the administration of analgesics. Journal of Pain and Symptom Management, 2, 213-218.

Lazarus, R. S., & Folkman, S. (1984). Stress appraisal and coping. New York: Springer Publishing Company.

Liebeskind, J. C., & Melzack, R. (1988). The international pain foundation: Meeting a need for education in pain management. Journal of Pain and Symptom Management, 3, 131-132.

Lisson, E. L. (1987). Ethical issues related to pain control. Nursing Clinics of North America, 22, 649-659.

Malseed, R. T. (1982). Pharmacology: Drug therapy

and nursing considerations. Philadelphia: J. B. Lippincott Company.

Maslow, A. (1970). Motivation and personality (2nd ed.). New York: Harper & Row.

McCaffery, M. (1985). Narcotic analgesia for the elderly patient. PRN Forum, 4, 1-2.

McCaffery, M. (1979). Nursing management of the patient with pain (2nd ed.). Philadelphia: J. B. Lippincott Company.

McCaffery, M., & Hart, L. L. (1976). Undertreatment of acute pain with narcotics. American Journal of Nursing, 76, 1586-1591.

Patwell, T. (1987). Postoperative care of the elderly surgical patient. The Journal of Practical Nursing, 37, 34-37.

Polit, D. F., & Hungler, B. P. (1987). Nursing research principles and methods. Philadelphia: J. B. Lippincott Company.

Reiss, B. S., & Melick, M. E. (1987). Pharmacological aspects of nursing care. Albany, New york: Delmar Publishers, Inc.

Saxey, S. (1986). The nurses's response to postoperative pain. Nursing, 10, 377-380.

Short, L. M., Burnett, M. L., Egbert, A. M., & Parks, L. H. (1990). Medicating the postoperative elderly: How do nurses make their decisions? Journal of Gerontological Nursing, 16, 12-17.

Spencer, R. T., Nichols, L. W., Lipkin, G. B., Waterhouse, H. P., West, F. M., & Bankert, E. G. (1986). Clinical pharmacology & nursing management. Philadelphia: J. B. Lippincott Company.

Strumpf, N. E. (1987). A new age for elderly care. Nursing & Health Care, 8, 445-448.

Wallace, P. G. M., & Norris, W. (1975). The management of postoperative pain. British Journal of Anaesthesia, 47, 113-120.

Weis, O. F. , Sriwatanakul, K., Alloza, J. L., Weintraub, M., & Lasagna, L. (1983). Attitudes of patients, housestaff, and nurses toward postoperative analgesic care. Anesthesia Analogue, 62, 70-74.

Wells, T. J. (1987). Nursing model & research compatibility: Concerns and possibilities. Journal of Gerontological Nursing, 13, 20-23.

Wolanin, M. O. (1983). Clinical geriatric nursing research. In H. H. Werley & J. J. Fitzpatrick (Eds.), Annual Review of Nursing Research, 1 (pp. 77-95). New York: Springer.