

1996

## A Comparison Study of Emergency and Medical/Surgical Registered Nurses' Understanding of Pain and Its Management

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A COMPARISON STUDY OF EMERGENCY AND MEDICAL/SURGICAL  
REGISTERED NURSES'  
UNDERSTANDING OF PAIN AND ITS MANAGEMENT

By

Jo A. Oborski

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

1996

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## ABSTRACT

### A COMPARISON STUDY OF EMERGENCY AND MEDICAL/SURGICAL REGISTERED NURSES'

### UNDERSTANDING OF PAIN AND ITS MANAGEMENT

by

Jo Ann Oborski

This replication study was designed to compare emergency and medical/surgical registered nurses' actual and perceived knowledge of the pharmacological and nonpharmacological aspects of pain and its management. A modification of the original tool that consisted of a combination of multiple choice, short answer and open-ended questions was utilized. A convenience sample representing beginner and expert medical/surgical and emergency nurses was obtained.

No difference was found between specialty or experience and current pain knowledge. All participants functioned at a similar level. Participants were unable to describe basic terms related to current pain theory and therapy. The only significant difference identified between participants' pain knowledge was that emergency nurses displayed a better

understanding of morphine. Participants identified a need for further knowledge of pain and felt it should be provided by the employer's inservice education department. This study supported the findings of the original investigation.

NOTE. This replication study was conducted with permission of the originator, Frances Fothergill-Bourbonnais R.N. Ph.D. (see Appendix A)

Dedicated to advancing professional nursing knowledge of  
pain theory and management.

## ACKNOWLEDGMENTS

To Mary Horan, R.N., Ph.D., for the opportunity to complete this investigation and degree "long distance".

To Emily Droste-Bielak, R.N., Ph.D., Linda Bond, R.N., Ph.D., and Brian Curry, Ph.D., for their guidance and understanding.

To the nursing administration and staff of Cook County Hospital, Chicago, Illinois, for providing the site and participating as research subjects and assistants.

To my family for their unwavering support.

Without all of you this study would not have been completed.

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## CHAPTER 1

### INTRODUCTION

Whatever its origins, pain is a nuisance, a burden, an agony and an affliction (Agbababian, 1986). No one, other than possibly the rare psychiatric patient, likes it. Everyone with an intact nervous system experiences it, and the good it does frequently defies the imagination (Bodanis, 1984).

More than 95% of the individuals seeking health care initially do so because of pain (Agbababian, 1986). Pain, from the afflicted individual's perspective, coupled with its intensity, suddenness of onset and location represents an emergency. It frequently portends dreaded disease or impending demise. For the health care provider, who must evaluate, diagnose and treat the complaint, pain is viewed as a symptom to be evaluated in conjunction with other equally important indicators in order to reach a correct diagnosis. A recent study cited by Jurf and Nirschi (1993) indicated that 40% of surgical patients and 75% of all hospitalized patients experienced severe pain while in the hospital.

The emergency nurse frequently must support a patient without pain medication before an accurate diagnosis is made, while at other times immediate and accurate assessment and intervention may be life saving. The medical/surgical nurse is aware of an admitting diagnosis and possibly a surgical intervention. The development of pain which is different in intensity, quality and location than what is normally expected may indicate an unexpected complication requiring immediate intervention. This requires the medical/surgical nurse to have a basic understanding of what to expect in numerous situations, yet not categorize the individual patient into a diagnostic group in which all are treated in the same manner.

It is the responsibility of all health professionals to address pain, although nurses are ultimately the key to its management. Physicians may order medication but the nurse must administer it appropriately. In addition, nurses have at their disposal many nonpharmacological interventions for pain control which do not require a physician's order. As a part of professional practice the nurse is expected to identify appropriate situations and initiate such interventions as distraction, massage, music therapy, exercise, therapeutic touch and position change to supplement or replace pharmacological pain control when appropriate.

Lack of pharmacologic knowledge has been shown to affect decisions by both physicians and nurses (Cohen, 1980; Marks & Sachar, 1973). Both physicians and nurses have been shown to overestimate the potential for addiction while under estimating the extent of analgesia provided by a given amount of medication (Cohen, 1980; Marks & Sachar, 1973). The underlying attitude of health care professionals that they, rather than the patient, know how much pain is being experienced compounds the problem.

Primary responsibility for poor pain management is inevitably placed on the nurse and physician. Seldom is the patient considered as actively or passively contributing to the pain experience, nor do studies address other health care professionals such as physical therapists, x-ray and phlebotomy technicians, all of whom may add to the patient's overall pain experience. The literature suggests that nurses only are affected by patients' traits and behaviors when dealing with pain management problems (Lander, 1990). It is illogical to assume other health care professionals, including physicians, are so astute as to be completely unaffected and unbiased in their approach toward any and all individuals.

Health care providers frequently utilize personal experience as a basis upon which to evaluate an individual's pain (Meinhart & McCaffery, 1983). Each individual's pain

experience is different, and similar experiences within the same individual will not result in comparable pain experiences. As a result, personal experience is an unacceptable basis from which to evaluate pain. This is not meant to imply that experience is not a fairly accurate yardstick by which to measure individual reactions, but it is not absolutely fail safe.

Two points must be considered regarding attitudes of persons viewing others in pain when considering the relationship of culture to pain. First, the health care provider's ability to sympathize with another person depends on the professional's ability to identify imaginatively with the patient. Second, health care professionals, like everyone else, are less concerned with a hurt to someone we do not know (Meinhart & McCaffery, 1983). Health care practitioners are conditioned to approach pain in a stoic and accepting manner, and expect these same behaviors in others. Those who base assessment on personal experience fail to recognize that each pain experience is unique, both within the individual and between individuals. Similar experiences within the same individual will not result in comparable pain responses. It is virtually impossible for the health care provider to know, comprehend and accept every aspect of every patient's psychosocial and emotional

background as it affects the individual, and in turn influences the individual's pain behaviors.

In addition to the ethnic background, gender and socioeconomic background of both the nurse and patient, the specific disease process or types of wound, incision or surgical procedure also influence the pain response. When questioned, the majority of nurses indicate patient size and type of surgery are the criteria they utilize most often in making analgesic related decisions (Camp, 1988).

Patients may report pain, but often do not report it accurately. Causes may include language barriers, misunderstanding, fear of injections or of the side effects of drugs to name a few. Studies have shown that up to 75% of all patients minimize their verbal report of pain to the health care provider responsible for their care. These individuals make statements which indicate pain control is adequate, when in fact it is not. Other causes for patients minimizing reports of pain may be a poorly designed assessment methods which allow bias to occur. The atmosphere of the hospital may also influence patients' reporting. Patients frequently perceive that they lack power to influence health care professionals, which may cause them to report pain therapy as satisfactory, when in reality it is not.



Donovan, Dillon & McGuire (1987) indicate that today the existence of pain in hospitalized patients is assumed and accepted by all levels of health care providers. In the last twenty-five to thirty years pain management has become an increasing concern within the health care community and increasing numbers of studies have attempted to determine the incidence and extent of pain. Some of these studies have also attempted to identify the effectiveness of current pain management techniques.

Considering the current level of pain knowledge and understanding of pain as compared to that of thirty years ago, one might assume pain management has improved proportionately, and suffering equally reduced. Current studies (Agbababian, 1986; Jurf & Nirschl, 1993; Lander, 1990) indicate approximately three quarters of all hospitalized patients continue to experience moderate to severe pain during their hospital stay. Why existing knowledge fails to be disseminated and applied clinically must be addressed. Health care providers have a humanitarian responsibility to do all in their power to improve the health and well being of the individual. Technology exists to facilitate this, yet pain control is often not being accomplished. It is imperative to investigate why this technology is not being applied and determine ways to rectify the situation.

It has been suggested that new and better pain strategies should be sought (Lander, 1990). Perhaps a better approach would be to educate and employ the existing knowledge and interventions. Only after current strategies are applied to their full potential should new strategies be necessary. Because current therapies have not been fully implemented, it would be doubtful that any new strategies would be any better utilized.

The economic impact of pain is extensive, although it is certainly not the most humanitarian of reasons for addressing pain control. Rather than the current approach of limiting and controlling health care, improved application of current therapies would aid in cost containment. Uncontrolled pain within the acutely ill individual may result in multiple physiological complications which impede recovery and increase the length of hospitalization and/or stays in long term care facilities. In today's business oriented health care environment, complications are to be avoided at all cost. A study of one pain management program indicated a 74% reduction in hospital bed occupancy days over one year by the 47 patients in the program, due to its effectiveness in controlling their discomfort (Lander, 1990). Assuming this to be an average savings, the overall potential impact on health care cost savings would be substantial if pain could

be adequately controlled. Health care consumers are becoming less enchanted with, and less intimidated, by the health care system and its providers. They now ask questions and want answers. When considering the financial impact of health care on the individual, today's consumers expect to receive optimal care for their health care dollar. Being allowed to remain in pain is rarely viewed as acceptable. As a result of these changes in attitudes, law suits have been successfully brought against health care providers for monetary damages as a result of inadequate pain control. The health care provider should not have to be threatened or involved in legal actions in order to initiate change in behaviors which can only improve the situation for the patients they care for. These changes in the health care environment and patient attitudes, as well as the financial impact on the individual and society, make it imperative that every nurse becomes a knowledgeable advocate and works to ensure adequate pain management (Jurk & Nirschl, 1993).

Problem statement:

It has been demonstrated (Cohen, 1990; McCaffery & Beebe, 1989; Meinhart & McCaffery, 1983) that nurses as a whole lack knowledge related to pain management while being held accountable for pain management in the hospital setting.

Despite the importance and extent of the problems which have been suggested, the research into analgesia and sedation practice in acutely ill patient populations remains limited. At present more questions are raised than answered (Evans 1993). As Evans (1993) indicates, nursing research in the area is essential to create a scientific basis for both nursing and multi-disciplinary interventions. This is one way to determine if the rituals and routines to which we now tenaciously cling contribute positively to patient outcomes. Whether we wish to admit it or not, nurses do independently assess, prescribe and treat within the limits of the physician's orders. Possibly nurses are not being adequately prepared to assume this responsibility. Also there is an overall lack of consistency in pain assessment among nurses in caring for their patients. Current research indicates most nurses continue to rely on experience, coupled with physiological symptoms and the size of the visible injury, while assessing pain.

Purpose:

The purpose of this study was to compare emergency and medical/surgical registered nurses' actual and perceived knowledge of the pharmacological and nonpharmacological aspects of pain and its management. Emergency nurses were chosen because the majority of patients arriving at the emergency department initially do so because of pain. The

emergency room is frequently the site of the initial assessment of symptoms and entry into the health care system. Since pain is a primary reason individuals seek medical care, its assessment and management should be of primary importance to the nurse in the emergency room. Medical/surgical nurses represent the largest overall specialty group within the hospital facility. These nurses care for the largest number, and most diverse categories, of patients during hospitalization. Both groups of nurses must possess a diverse knowledge base in order to care for the patients in these areas.

Through differentiation of levels of nurses' knowledge and assessment skills, the problem of pain control within the health care setting will be better understood. Improved pain control should allow healing to progress more rapidly. There should be a reduced demand on limited health care resources and patient satisfaction should increase.

## CHAPTER 2

### CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

Authors frequently describe pain as a purely physiological process, while in reality physical pain has a definite psychological component. "An especially difficult component of pain management is to understand the patient's perception of pain" (Camp, 1988, p.238). This requires differentiating between the physical experience and the emotional component. Purely psychological pain has been documented, but is rare. A practicing psychiatrist might expect to see one or two cases during an entire professional career (Bodanis, 1984). Purely physiological pain without a psychological component must be equally rare. Rather than the degree of injury, it is the meaning attached to the specific pain experience coupled with the anxiety level and helplessness/powerlessness of the patient to control the situation which determines the overall perception of the pain experience (Ferguson, 1992), and which must be assessed. Anxiety frequently accompanies pain which in turn causes an increased arousal of the reticular activating system (RAS) and cerebral cortex of the brain. This

activation of the RAS and cerebral cortex results in greater awareness of all unpleasant stimuli (Ferguson, 1992). It has long been established that inaccurate expectations, anticipation and feelings of being helpless or powerless to control the situation result in increased anxiety and in turn increased pain perception (Ferguson, 1992).

#### Overview of Conceptual Framework:

The framework for this study addressed the following aspects of pain and the role of the nurse in its control: pain measurement, the meaning and interpretation of the individual's pain experience by the patient and the health care professional, the Gate Control Theory of Pain, the physiology of pain transmission, and Orem's Self Care Theory of Nursing as it relates to pain control.

#### Introduction:

##### Definitions of Pain:

As a result of the numerous definitions being utilized by various professions working in the field of pain, the International Association for the Study of Pain, IASP (1979), developed a list of pain terms and definitions intended to encompass all aspects of the phenomena. The list was intended to be a minimum vocabulary to improve communication between the various disciplines (McGuire, 1985). The IASP definition stated "pain is an unpleasant sensory and emotional experience associated with actual or

potential tissue damage and described in terms of such damage" (McGuire, 1985, p. 83). In response to the IASP definition, Melzack and Wall (1983) proposed that pain be "viewed as a category of experiences rather than one specific experience" (McGuire, 1985, p. 83). Rationale for their proposal was based on the belief that, at the time, too little was understood about the pain experience for a meaningful definition to be developed. This discussion of whether pain is a single experience, or a category of experiences, seems irrelevant. Anyone with an intact nervous system has a working understanding of the concept from personal experience. It would be logical to accept that pain is whatever the experiencing person says it is and exists whenever and wherever he/she says it is present (McCaffery, 1979).

#### Physiologic Indicators of Pain:

Pain cannot be objectively measured like other physiological responses. Observable signs of pain may or may not be present in any situation and should never be used as a standard by which to determine if pain is present.

Physiologic signs of superficial pain which are initiated by the sympathetic nervous system including rapid, shallow or guarded respirations, pallor, increased pulse rate and blood pressure, diaphoresis, dilated pupils and tenderness of the skeletal muscles in the area of the pain.



By contrast severe pain which originates deep within a body cavity stimulates the parasympathetic nervous system resulting in lowering of the blood pressure and pulse, nausea, vomiting, pallor, generalized weakness and sometimes going so far as to cause total loss of consciousness (Meinhart & McCaffery, 1983). Additional behaviors observed in the person experiencing severe pain may include tossing in bed, pacing, crying, moaning, lying very quiet refusing to move from one position, curling into fetal position as a protective mechanism, displaying a pinched facial expression and rubbing of a painful part.

#### Pain Measurement:

Current methods of pain measurement allow the patient to numerically identify a predetermined number such as zero for pain free and ten as the worst pain imaginable. One subject's worst pain may be another subject's minor irritation. The individual who has had previous experience with severe pain may rate a current situation lower than one who has had no previous experience with severe pain. This is a major limitation of this type of assessment process as the health professional must have a knowledge base and understanding of the individual's background and experiences. Because many experiences and influencing factors may be buried in the subconscious, this may be impossible even with a willing and cooperative patient.

Inability to objectively measure pain leaves all individual responses within a clinical setting, as well as research findings, open to subjective interpretation and debate. In order to limit the impact of this subjectivity it is necessary for all who carry out this critical assessment to do so in a standardized manner. In this way the information obtained and utilized in making decisions related to pain management will be similar in all situations.

#### History of Pain Theory and Study:

Understanding the history of man's attitude toward pain helps in understanding current beliefs. Pain is a universal and life long experience originating from three basic areas: within the body as it ages and deteriorates, from the external environment, and from physical and emotional relationships with other humans (Jaros, 1991). It is this last, the emotional responses to interactions with others that remains the least studied and least understood aspect of the pain experience.

Earliest man probably understood quite clearly the concept of physical injury and a visible wound. Fire burned and an attack by a wild animal or enemy caused physical injury resulting in pain. Diseases were more difficult to understand. They struck, seemingly without warning and without a means of identifying where or what was the cause.

Disease, and the pains associated with it, were soon attributed to some supernatural force that possessed magical powers. This supernatural force rapidly acquired a god-like status, and disease was viewed as retribution for angering an unseen deity. With the advent of the supernatural power came the shaman, the priest, the medicine man and eventually the physician as an individual with special powers to placate the angry god (Jaros, 1991).

Historically, pain has been recognized as a medical problem since the time of the ancient Greeks, when Aristotle (BC 384-322) described pain as the opposite of pleasure (Jaros, 1991). Though recognized as a problem, it was viewed as an unavoidable, if unpleasant, aspect of everyday life and medical care. Aristotle identified five senses: sight, hearing, taste, smell and touch. Pain was considered to be an excess of the sense of touch. Aristotle felt that pain was channeled to the heart, the center of all emotion (Jaros, 1991).

Five hundred years later Galen, a Greek physician, dissected newborn pigs to identify nerves and innervation of individual organs. He argued against Aristotle, claiming that the brain, rather than the heart, was the center of sensibility. Galen's theories were never completely accepted and Aristotle's five senses with the heart as the

center of sensibility prevailed as the accepted theory for the next twenty-three centuries (Jaros, 1991).

As Jaros (1991) states, the fall of the Roman Empire resulted in a serious decline in western learning. The loss of a strong central government meant that, throughout the Dark Ages, individual towns and groups were left to worry about simple survival against hostile forces. One learned to physically survive, which was about all that one could hope for. Learning during the Dark Ages was restricted to the church and, as would be expected, this had theological concerns and implications. Disease and pain were viewed as a retribution from God, to be accepted in hopes of better circumstances in the promised afterlife. The Renaissance brought the resurgence of western civilization, education and scientific thought. The study of science, medicine and mathematics rapidly progressed throughout the western world during this period while Aristotle's concepts of pain continued to be accepted as fact (Jaros, 1991).

The nineteenth century brought about new thinking on pain (Jaros, 1991). The Specificity Theory gained in popularity (Jaros, 1991). In this theory pain was separated from touch and assigned its own sensory nerve endings (Jaros, 1991). The Intensive Theory was introduced by Erb in 1874 and postulated that any sense, including heat and cold, if stimulated in excess would result in pain (Jaros,

1991). Well into the twentieth century, a scientific basis for the Specificity and Intensive theories as well as Aristotle's concepts continued to be investigated in attempts to prove one over the other (Jaros, 1991).

Anesthesia was developed late in the nineteenth century and, while viewed as a practical and beneficial adjunct to surgery, its morality and use were widely debated (Jaros, 1991). With the advent of anesthesia, pain remained a medical problem, but with the potential for study and control (Jaros, 1991).

Until World Wars I and II, pain was studied almost exclusively on a physiological basis. During the 1930's and 1940's interest began to develop in the psychosocial aspect and its influence on the total pain experience. As a result of this increased interest, the potential for drug addiction was identified. Jaros (1991) identified studies which were conducted during the 1940's and 1950's which seemed to indicate that utilization of pain medication to achieve adequate relief would lead to addiction. These studies were accepted without question and health care providers chose to limit pain control in favor of avoiding the potential of addiction. Today we continue to try to overcome the effects of these studies which were accepted without replication and verification.

The theories of Aristotle, as well as the Specificity and Intensive theories, were finally disproved by such researchers as Burgess and Perl (Jaros, 1991). Melzack and Wall proposed the Gate Control Theory in 1965 (Jaros, 1991). Prior to developing this theory Melzack and Wall (1983) determined that, in order to be successful, any new theory must recognize the following parameters:

1. The high degree of physiological specialization of receptor-fiber units and of pathways in the central nervous system.
2. The role of temporal and spatial patterning in the transmission of information in the nervous system.
3. The influence of psychological processes on pain perception and response.
4. The clinical phenomena of spatial and temporal summation, spread of pain, and persistence of pain after healing (Melzack & Wall, 1983, pg. 222).

#### Established Physiology of Pain:

Physiologic pain is the direct result of some type of noxious stimuli resulting in tissue damage and the release of substances such as bradykinin, histamine, prostaglandins, hydrogen ions or some other pain producing substance (Substance P) (Puntillo, 1988). Substance P then activates the nociceptor or pain sensitive A-delta and C fibers (Puntillo, 1988). The A-delta fibers are myelinated, small

in diameter and carry acute sharp pain sensations. Acute pain transmitted by A-delta fibers is linear and subsides as healing progresses.

Acute pain is subdivided into cutaneous, visceral and deep somatic pain. Cutaneous pain occurs on the skin surface and within superficial tissues. Visceral pain originates from internal structures and results from organs being handled and manipulated during surgery or traumatic injury. Deep somatic pain originates from injury to bone, muscle, ligaments and fasciae (Puntillo, 1988). Should healing fail to occur, or an acute stimulus continues to cause tissue damage, the firing threshold of A-delta fibers lowers resulting in the perception that the pain is getting worse even though it may not be (Puntillo, 1988).

C fibers are larger in diameter than A-delta fibers, are unmyelinated, and transmit a burning, aching type of discomfort which may become chronic. As with A-delta like response the stimulus itself may not increase, or may actually decrease, in intensity but the resulting perception may be that the pain is becoming progressively more intense.

Both the A-delta and C fibers transmit primarily to the dorsal horn of the spinal cord. In the dorsal horn a synapse transmits the sensation from A-delta afferent fibers to secondary spinothalamic ascending neuron tracts which transmit the impulse to the brain. The spinothalamic tracts

terminate in the contralateral thalamus, the main sensory relay center of the brain. Here the spinothalamic fibers synapse with tertiary neurons which terminate in the postcentral gyrus and somatic sensory area II of the brain (Puntillo, 1988). Spinothalamic pain impulses that reach the thalamus can cause conscious pain sensation and a reflex protective reaction of the injured part. C fibers synapse with spinoreticular tracts which ascend on both sides of the anterolateral spinal cord, traverse the medullary and pontine reticular formation and terminate in the periaqueductal gray matter of the midbrain, the thalamic nuclei and the hypothalamus.

While conscious perception of pain probably occurs in the thalamus, hypothalamus and other centers of the midbrain, interpretation of pain quality, location, type and intensity is not recognized until the tertiary nerve stimulus reaches the post central gyrus and somatic sensory area II of the cerebral cortex. Sensations which reach the cerebral cortex result in anxiety and conscious suffering, which in turn produce fear. Fear then stimulates the Autonomic Nervous System (ANS) which results in a feedback loop intensifying the effects of the pain and pain response sequence (Jurf & Nirschl, 1993). This ANS feedback loop occurs in the frontal cortex of the reticular activating



(arousal) and limbic systems. The limbic system increases motivation, attention and mood.

Some afferent peripheral impulses will not make a synapse for upward transmission through the cord, but instead synapse with somatic motor neurons and/or sympathetic fibers at the spinal cord level in the anterior, or anterior lateral horns, resulting in a segmental reflex response. This reflex within the cord results in immediate withdrawal before the individual is fully aware that pain and injury is occurring.

#### Endogenous Opiates:

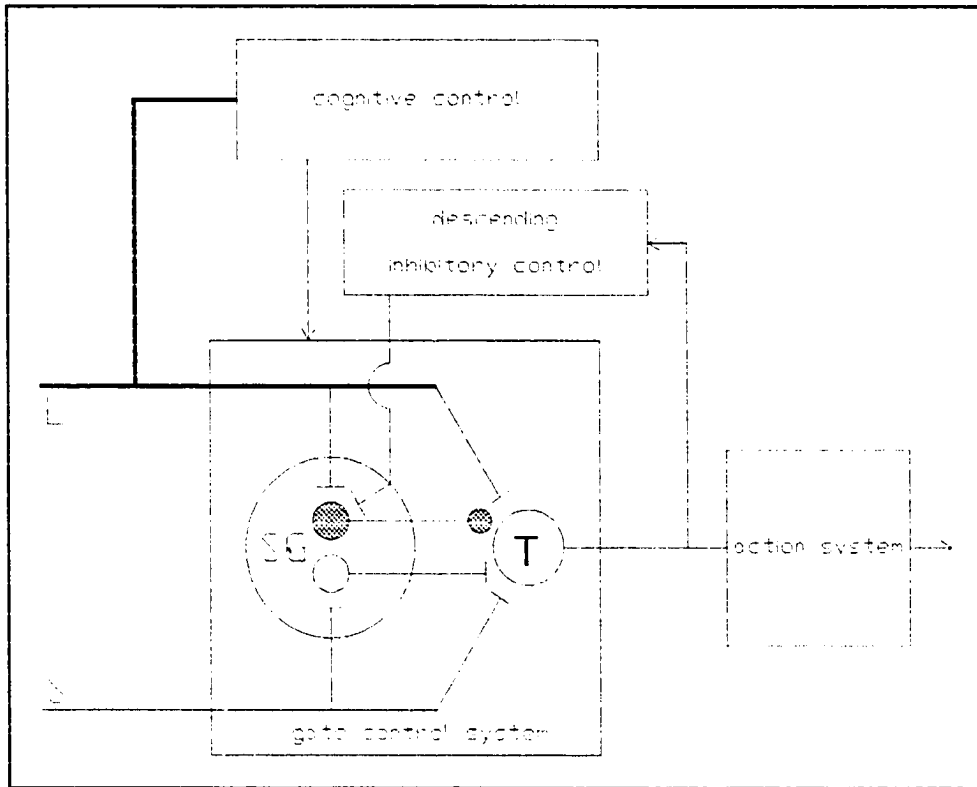
Endogenous opiates, known as enkephalins and endorphins are peptide hormones with morphine like properties which appear to support the Gate Control Theory on the cellular level (Melzack & Wall, 1973). Their function is to alter pain transmission at various points within the central pain pathway. Endorphins are found primarily in the pituitary gland, hypothalamus, and various brain stem areas while enkephalins are found primarily in the brain, spinal cord, adrenal glands and intestines. When the spinal interneurons are stimulated, the endogenous opiate is released and attaches to opiate receptor sites on the peripheral pain neuron blocking the release of Substance P and reducing the number of incoming pain impulses. This endogenous opiate activity appears to be directly related to the patient's

expectations and has been shown to relieve pain, affect temperature control and alter the level of consciousness. Variability among patients in reporting pain intensity for any given condition might be due to differences in endogenous opiate activity.

#### Gate Control Theory of Pain:

The Gate Control Theory attempts to explain how acute pain intensifies, and chronic pain eventually destroys the individual's emotional ability to cope with even the most mundane tasks and problems. It also offers explanations for phenomena such as the apparent lack of pain occasionally experienced by individuals during situations which should be extremely painful.

Siegele (1974) summarized the Gate Control Theory as it was presented by Melzack & Wall 1973 (see Figure 1). They proposed that small-diameter (S) peripheral nerves conduct pain impulses to the spinal cord. If not blocked, these impulses cross the synapse and proceed to the transmission (T) cells located in the dorsal horn of the cord. The pain impulse then proceeds, via the spinothalamic tract, to the thalamus and cerebral cortex. The authors proposed that the substantia gelatinosa (SG) a densely packed area of cells found in the dorsal horn at all levels, is the primary site of the gating mechanism. Gating occurs with stimulation



**Figure 1:**

The gate-control theory: Mark II. The new model includes excitatory (white circle) and inhibitory (black circle) links from the substantia gelatinosa (SG) to the transmission (T) cells as well as descending inhibitory control from brainstem systems. The round knob at the end of the inhibitory link implies that its action may be presynaptic, postsynaptic, or both. All connections are excitatory, except the inhibitory link from SG to T cell.

NOTE. From THE CHALLENGE OF PAIN (p. 235) by R. Melzack and P. Wall, 1973 New York: Basic Books Inc. Copyright 1982 by Penguin Books Ltd. Reprinted by permission (see Appendix B.)

of large (L) diameter cutaneous afferent nerves whose receptors are found close to the skin surface. Stimulation of these large diameter fibers occurs through activities such as rubbing, scratching, or vibration and produces an inhibitory post synaptic potential charge in the substantia gelatinosa. This negative charge is able to neutralize painful positive input charges from the small diameter fibers. The process of excitation versus inhibition produces a fluctuating check and balance system, which in turn determines whether the pain impulse reaches the transmission cells. Activity of the large diameter fibers weakens with continuous stimulation or extended use. Eventually the gate fails to close and pain is experienced.

Additional gating mechanisms are found higher in the CNS including the reticular formation of the cerebral cortex, the thalamus and the brainstem (Siegel, 1974). Stimulation of the brain stem can cause widespread analgesia through its numerous neural connections with the body. Descending central gating is influenced and initiated through emotional responses such as anxiety, anticipation, suggestion and memories of prior experiences. Descending central gating activities are categorized as motivation affect, sensory-discriminatory and cognition activities (Melzack & Wall, 1973). This central descending gating activity helps to explain responses which have been seen in

extensive trauma and other highly emotional situations in which an injured person continues to function with seemingly little discomfort (Siegele, 1974). Melzack and Wall (1973) indicate there is no single pain center, but that the entire brain serves this purpose as the entire cerebrum interacts to interpret pain and respond to it.

At the present time the Gate Control Theory continues to be questioned by practitioners in the field, but as yet a replacement theory has not been suggested. Considerable research seems to support their theory, at least in principle, even if specific concepts are found to be inaccurate (Siegele, 1974).

With the growing recognition of the extreme complexity of the nervous system, the Gate Control Theory (Melzack & Wall, 1983) is far more complicated than any of its predecessors. It is an integration of physiological and psychological responses which influence each other through feedback loops, and as a result affects perception and response to painful stimulation. Some critics have found the Gate Control Theory lacking, especially in its coverage of the psychological dimensions of pain. One such critic has stated "its coverage is so rudimentary that the theory has weak operational, empirical and pragmatic adequacies" (Kim, 1980, p. 43). Weaknesses in the emotional and psychological aspects of the original theory have been

recognized by its developers. As a result the theory continues to be revised as new information is identified (Melzack & Wall, 1983).

#### Psychology of Pain:

Psychological and emotional responses are formulated by culture. Culture determines the individual's language, beliefs, behaviors and attitudes (Spector, 1979).

Culturalization of acceptable behaviors begins early in life within the family setting. The mother is the initial teacher. She is quickly followed by the father, siblings, the extended family, and in time, social acquaintances.

Acceptable behaviors are rewarded while others, which are unacceptable, are ignored or punished. While cultural background influences the pain perception threshold, its strongest effect is on pain tolerance. The individual's cultural group influences one's pain behavior. However, the emotional make up of the introvert or extrovert, equally or more so than culture, influences the pain response.

Introverts are, by nature, less expressive about all things including pain. Extroverts are highly expressive and utilize more descriptive terms to describe an experience. As a consequence, the quiet introvert may be ignored and allowed to suffer in silence while his/her more vocal extroverted counterpart will receive attention.

There is a primary language within each culture. Dependent on the individual's cognitive ability, words from that language are chosen to describe pain. The words used in some cultures to describe pain suggest it is approached from a psychological perspective, while others suggest a physical approach. Some languages lack words with which to describe certain situations making communication extremely difficult. In countries such as the United States where cultures intermingle, the primary language of the country may not be that of the individual. The individual who is able to communicate using a local language may lack the cognitive ability to effectively communicate needs. Inability to communicate the pain experience in the primary language of the health care provider may result in total miscommunication. An individual in pain may temporarily lose the ability to communicate in a secondary language, reverting back to a primary language even if the secondary language has been well known and understood prior to the pain episode (Puntillo, 1988).

As with the patient, the ethnic, cultural and religious beliefs and emotions of the health care provider influence individual perceptions of pain and pain related behaviors. If any of these are in conflict with those of the patient there is an area for potential misunderstanding.

In summary, emotion is synonymous with the stress reaction component of pain. Response to emotion varies widely from individual to individual and circumstance to circumstance within the same individual. The emotional response, or stress of pain, leads to the suffering of the individual (Puntillo, 1988). It is this psychological suffering, rather than the physiologic extent of pathology, which determines the extent of pain experienced (Puntillo, 1988).

#### Self Care Theory of Nursing Overview:

Orem's Self Care Nursing Theory (1995) is a three-part model of nursing that demonstrates how the nurse functions and interacts with the client/patient in the various levels of health care. The three parts include self care, self care deficits and nursing systems.

The ultimate goal of self care is to have the patients assume responsibility for their own health whenever possible, and to collaborate with nursing when they are not able. This seems a most appropriate approach especially when dealing with pain, due to its totally subjective nature.

Orem (1995) indicates that nursing is an act performed by individuals who are members of a specific group (nursing profession). Nursing is based on specific educational achievement and ability to render nursing service to others



who, due to a lack of ability and/or this specialized knowledge, cannot do these things for themselves. Self care is not limited to those activities an individual does for him/her self, but includes those activities performed by an individual for another (a dependent care giver, who may not be a professionally educated health care provider) until such time as the dependent individual is capable of assuming, or resuming, those activities. These statements indicate that while the ultimate goal of nursing is health, the catalysts to initiate the process are disease, disability and knowledge deficits.

Orem (1995) views health as a basic premise of everyone's life even if some specific health related activities are carried out without conscious consideration of how they directly impact the health and well being of the individual. The self care (health) theory focuses on the individual's state of wellness, and refers to what was once known as the activities of daily living (Riehl-Sisca, 1989). These activities are those an individual does to maintain the healthy state. The emphasis is on the relationship which exists between a mature individual and the individual's psycho/social, emotional and educational developmental level, combined with an existing degree of physical ability to function to meet one's own, or a dependent's, activities of daily living.

The focus of self care is an ongoing need to meet universal and developmental needs of all living beings. Universal needs include food, water, shelter, air and exercise and are experienced by everyone throughout the life cycle. Developmental needs change as the individual grows and progresses through the life span. When problems arise an unhealthy state exists, and there is a need for nursing intervention.

The second part of Orem's model (1995) describes self care deficits or illness. This is the core of Orem's model in the health care facility, where the focus is on the ill individual who is attempting to regain the self care or healthy state. The symptoms and effects of illness, interacting with specific characteristics of the individual, combine to produce the identified self care deficits. These may be physiological as well as psychological in nature.

During the assessment phase of the nursing process, self care deficits and the client's existing self care abilities are identified. When deficit demand exceeds self care ability the client becomes a patient and a recipient of nursing care (Orem, 1995). Health deviation self care demands include obtaining appropriate medical care, carrying out medical treatment, and learning to live with conditions which cannot be eradicated by, or are the result of, current therapies. These self care deficits, or illness generated

needs, must then be considered in conjunction with the universal and developmental level self care needs of the individual (Orem, 1995).

The nursing process consists of an interaction between the patient's therapeutic self care demand, his/her self care agency and nursing agency. Agency is Orem's term for knowledge or ability. When utilizing Orem's model, the focus of the clinical nurse is toward identifying self (or dependent) care ability and self (or dependent) care deficits. When these needs cannot be met by existing abilities a deficit exists and creates a need for nursing intervention. It is here that the nurse must have the knowledge base and technical skill to assess and intervene to overcome the identified deficits. It is here that the Gate Control Theory (Melzack & Wall, 1983) may be applied as nurses utilize their knowledge of pain and its management in developing an individualized treatment plan for the patient.

Nursing systems is the third aspect in Orem's (1995) model. The nursing systems theory states that nurses use their knowledge, skill and abilities to implement the nursing process.

Through these nursing systems, the nurse assists and directs the client's self care activities toward the agreed upon outcomes. There are two dimensions to the nursing systems portion of the theory. The nurse/patient

relationship consists of social, interpersonal, and technical aspects. The professional and technical interactions between the patient and nurse are contractual, in the form of a written nursing care plan agreed upon by both the patient and nurse. The second dimension identifies three types of nursing systems. These include wholly compensatory, partially compensatory and supportive educative. The first and most complex level of nursing is wholly compensatory. At this system or level of nursing, the nurse assumes responsibility for virtually everything to maintain a totally dependent patient. When an opportunity exists prior to the development of this level of dependence, the nurse may interact with the patient to ascertain the patient's wishes for care. Although prior directives are ideal, this is usually not the case. In this situation the nurse is left to assess, intervene and reassess the effects of his/her interventions without patient input. At the partially compensatory level the patient does as much for him/her self as possible while the nurse assumes the remaining tasks. At this level the patient is able to communicate needs and wishes and offer feedback on the effectiveness of interventions. The educative supportive level involves guiding, teaching and supporting the patient in his/her endeavors to overcome deficits, and to become independent of the health care system. These levels are not

concrete steps. The patient may be on more than one nursing needs level at any given time.

The prioritization of problems/deficits to be addressed is patient driven and incorporated into a plan of care. Pain should receive high priority. There may be identified diagnoses which are recognized, but left unattended, while more pressing requirements are addressed. Upon completion of deficit identification, it is necessary to determine the patient's desire and willingness to assume new, or alter existing, behaviors for assuming the new demand of self care due to the altered health status. Not only must there be a desire and willingness to change, there must also be physical capability to perform the necessary activities. The nurse takes into consideration all that is known regarding the patient's self care needs, deficits, diagnoses and desires. This information is used to select specific interventions to meet the patient's goals. Once an intervention is identified, it becomes necessary to plan how the patient can best implement these strategies. This is accomplished through nursing knowledge of potential interventions and understanding of the theories supporting their use. In the situation of pain, the Gate Control Theory (Melzack & Wall, 1983) is again applicable under the umbrella of the Self Care Theory approach to nursing care. The nurse determines how to proceed in order to help the

patient overcome these deficits. The entire process must be carried out in collaboration with the patient in order for a therapeutic system of action to be established and maintained.

The North American Nursing Diagnosis Association approves the use of pain and chronic pain as two nursing diagnoses for use in practice. Because pain has diverse physical and psychological implications, additional diagnoses are easily identified for use with either of these diagnoses. Some of these diagnoses are written specifically to address the concept of self care, and include feeding self care deficit, bathing/hygiene self-care deficit, and toileting self-care deficit (McCaffery & Beebe, 1989). Clearly this is not a complete list of potential pain related nursing diagnoses, but they do identify how pain and its treatment have a potential for seriously disrupting the individual's life by interfering with all aspects of existence.

#### Self Care and the Gate Control Theories As a Means of Understanding Pain:

Orem's theory (1995) is a global description of nursing's professional practice and as such describes what makes nursing unique from the practices of other health care providers. The theory describes when, where, and how,

nurses function and serves as an umbrella under which other theories are utilized within nursing practice.

A major concept of Orem's theory (1995) is that the individual is responsible for his/her own self care activities, and that self care deficits are frequently the result of a lack of knowledge pertaining to self care activities on the part of the individual or a dependant care provider. Orem believes that the existence of health care deficits indicates the need for nursing care. Overcoming health care deficits then becomes the next logical step. The role of the nurse is therefore not only that of a direct care giver but also that of a teacher in order to assist the individual to assume an independent role of a self/dependant care giver as soon as possible. Orem indicates that nurses utilize theories in their practice which are well grounded in other professions. This allows the nurse to choose specific interventions to individualize care. Thus a nurse might employ growth and development theories, various illness related theories and teaching/learning theories in the course of caring for one individual and one nursing diagnosis. Applying theory-based interventions for individual diagnoses allows the nurse to state that, based on research, a chosen intervention may be expected to have a positive outcome in a specific situation. This entire process then substantiates why the nurse has chosen and

applied a specific intervention, and that the intervention chosen has been shown to have an identified basis for being effective in overcoming specific symptoms.

The Gate Control Theory (Melzack & Wall, 1983) then would serve as a basis for why a nurse might choose and apply one intervention for pain while rejecting another. An example might be the patient who has recently experienced a major surgical procedure. In this situation the nurse might choose a combination of pain medications, from those ordered by the physician, which would block pain impulse transmission from both the operative site and within the central nervous system. While observing and interacting with the patient, the nurse might also identify that the hospital environment is a threatening situation for the patient based on a previous unhappy situation during childhood. As a result a medication used specifically for relaxation purposes might be incorporated with the pain medications as well as a relaxation technique such as distraction to focus the patient away from his/her fears. In this situation the Gate Control Theory (Melzack & Wall, 1983) serves as a rationale for approaching pain through closure of the gates at various levels within the cord and brain in order to block the release of Substance P. It also allows for interventions designed to refocus attention, thus



reducing anxiety as a means of reducing the cerebral cortex generated emotional aspects of anxiety associated with pain.

The Gate Control Theory (Melzack & Wall, 1983) indicates that pain control can originate from many sources, and is the result of blocking transmission of impulses at various sites as well as controlling the higher emotional responses which originate in the cerebral cortex. This is what differentiates the human response to pain from that of other species. Eliminating the cause of pain is certainly the best option and attacking it from multiple sites is the best approach. Currently, medications and devices such as TENS therapy, are primarily the responsibility of physicians to prescribe, with nurses utilizing them within the confines of the physician's orders. For those individuals for whom medical interventions are not completely effective or satisfactory, nonmedical interventions may be the only alternative. It is here that the professional nurse intervenes, suggesting and teaching approaches designed to improve the quality of life to whatever level of wellness the patient may be able to achieve.

Orem's theory (1995) allows the nurse to apply theories which are well grounded in other sciences. It does not specify that any particular level of educational preparation for nurses allows for independent theorizing in practice. This leaves one with the assumption that all nurses are

expected to understand and apply theory in their practice. Orem also indicates that the nurse, in cooperation with the patient, identifies health care deficits, develops and writes care plans, select and initiates teaching to meet the individual's needs in overcoming identified deficits. This sequence indicates that any nurse must have knowledge of, or easy access to, resources where theories and information relating to any health care deficit may be obtained. Because pain is a common problem, one would expect all nurses to have a working knowledge of it and the more commonly applied interventions, as well as the theories supporting their use.

#### Literature Review:

The studies reviewed have been limited to those conducted by nursing and medical investigators. Several of these studies have been cited as a basis for at least one other major investigation and, as such, served as a building block in the development of in-depth understanding of the current pain problem.

Over the past 25-30 years numerous research studies have attempted to identify a cause for the continuation of moderate to severe pain in the acute care setting despite the development of improved pharmacological and nonpharmacological methods of pain management (Camp & O'Sullivan, 1987; Choiniere, Melzack, Girard, Rondeau &

Paquin, 1990; Cohen, 1980; Donovan, et al. 1987; Marks & Sachar, 1973; Owen, McMillan & Rogowski, 1990). Despite on going research, no significant improvement in acute pain management has been identified since the Marks and Sachar study of 1973 (Donovan, et al.). Recent investigations have determined that a primary problem in pain management is a knowledge deficit ( Marks & Sachar, 1973; Cohen, 1980; Donovan et al.; Camp & O'Sullivan, 1987; Choiniere et al.; Owen et al.). This deficit involves all three participants in the pain management triangle: the physician, (Marks & Sachar, 1973) the nurse (Cohen, 1980; Camp & O'Sullivan, 1987; Donovan et al.; Choiniere et al.; Owen et al.) and the patient (Owen et al.).

Marks and Sachar (1973) noted that physicians lacked knowledge in the areas of pharmacological actions of narcotic analgesics, addiction, withdrawal syndromes, and assessment of pain. Physicians felt threatened by the potential of criticism by their peers and other health care professionals should their orders allow a patient to develop side effects such as euphoric responses or withdrawal symptoms from narcotics (Marks & Sachar, 1973). The suggested remedy was reeducation of all physicians, improvement of medical education to emphasize the importance of pain management (Marks & Sachar, 1973), and the

development of pain management teams for consultation in the management of complicated cases (Marks & Sachar, 1973).

Nurses displayed the same concerns and knowledge deficits as physicians regarding narcotic analgesics, addiction and withdrawal syndromes from narcotic analgesics (Cohen, 1980). Nurses do not identify the elimination of pain as a primary goal, nor is it given a high priority in nursing activities (Cohen, 1980). Nurses do not assess pain consistently (Camp, 1988; Camp & O'Sullivan, 1987; Cohen, 1980; Donovan et al. 1987; Owen et al. 1990). They frequently limit their assessments to observing for physical signs and occasionally ask the patient for verbal verification of their findings (Camp, 1988; Cohen, 1980). As a result nurses fail to identify pain as a nursing diagnosis (Donovan et al. 1987). Nurses display an attitude of puritanical judgement of pain behaviors, as well as pain management decisions, which result in displays of euphoria, withdrawal symptoms and addiction to narcotic analgesics (Donovan et al. 1987; Marks & Sachar, 1973). Nurses are unable to predict the amount of pain a patient may expect to experience during a procedure (Choiniere, et al. 1990). This continuing failure, on the part of nursing, to recognize pain is a major reason for the lack of treatment of pain (Donovan, 1978). Practicing nurses indicate that

the majority of their pain management knowledge was acquired at the bedside (Camp, 1988).

The suggested remedy (Cohen, 1980) was the same as that for physicians made by Marks and Sachar in 1973. It was recommended that all nurses be reeducated regarding pain mechanisms and management, with an emphasis on pharmacological interventions and their actions. An improvement in the formal nursing educational system should also be made leading to an emphasis on the significance of pain management (Cohen, 1980; Donovan et al. 1987).

Donovan, Dillon & McGuire (1987) identified several misconceptions about pain which are common throughout the health care community. These include the beliefs that patients in pain do not sleep, patients experiencing pain within the health care facility always report it to the health care provider, and pain is always well managed. Health care providers believe that patients actually receive more narcotic analgesics that are necessary, and that only mild pain is relieved with nonpharmacological interventions.

Like the physician and the nurse, patients display knowledge deficits (Owen et al. 1990). The major deficit is how and when to interact with the health care team to facilitate having their needs met (Owen et al. 1990). Marks and Sacher (1973) indicate that preoperative pain management teaching is done by physicians. Yet patients continue to

lack knowledge about how and when to request pain medication (Owen et al. 1990). Patients frequently feel they lack control in the health care environment (Owen et al. 1990). To overcome this, patients should be educated about their need to join with the physician and the nurse and actively participate in their care rather than assume a passive recipient position (Owen et al. 1990).

Like the physician, and unlike the nurse, the patient's goal in pain management is complete relief when possible, and at the very least to be distress free (Cohen, 1980; Marks & Sachar, 1973; Owen et al. 1990). Very few patients are so unrealistic as to expect no pain after a surgical procedure (Camp, 1988; Owen et al. 1990). In addition to being pain and/or distress free, patients expect nurses to anticipate their pain and to respond without being asked (Owen et al. 1990). Should a direct request for pain relief be made, patients then expect an immediate response by the health care provider, and immediate relief as the pain has already been allowed to progress to intolerable levels (Camp, 1988; Owen et al. 1990).

Individual responses to pain vary from person to person and from experience to experience (Camp, 1988; Owen et al. 1990). Responses are influenced by an infinite number of factors including life experiences, some of which may be on a subconscious level (Camp, 1988). Other influencing

factors include the particular health problem and the specific cause of the discomfort (Camp, 1988). Culture influences attitudes toward pain, although wide variations are found within individuals of any cultural group (Camp, 1988).

The identified means of improving pain management methods include developing a consistent tool with broad applicability which can be easily and quickly administered so that pain assessment is consistent (Choiniere et al. 1990; Owen et al. 1990).

A study by Fothergill-Bourbonnais & Wilson-Barnett (1992) was designed to determine the level of preparation, and compare the working knowledge base, of intensive care and oncology/hospice nurses regarding pain assessment and management through pharmacologic and nonpharmacologic means. The study was conducted at two teaching medical facilities and four hospice services in London, England.

The researchers, in conjunction with consultants who were expert in nursing education and pain management, conducted a literature search of previous investigations. This allowed the researchers to identify subjects deemed important for inclusion in this investigation.

A three-part instrument was developed: a twelve-item multiple-choice question section, a seven questions short answer section, and a demographics/personal opinion section.

The clinical aspect of the tool addressed theoretical aspects of pain drawn from current nursing literature including pharmacological knowledge and its clinical application, signs and symptoms of acute pain, various nonpharmacological methods of pain management, knowledge and understanding of addiction, and nurses' perceptions of their current knowledge base in this area. Short-answer questions were utilized in an effort to determine more detailed information regarding the nurses' understanding of specifics of pain theory and management as it is identified in the literature, including the Gate Control Theory and the functioning of endorphins in pain control.

A pilot study to determine the feasibility of planned interview schedules and application of the tools was conducted. The authors also used this pilot study to determine the difficulty and discrimination levels of the multiple choice questions. The pilot study showed that difficulty ranged from 0.32 to 1.00, indicating that none of the questions were extremely difficult. The reliability for the main study was established at 0.00 to 0.50. This was accepted as indicating that individual questions discriminated in a manner similar to the entire tool. Thus, anyone who did well on any one question had an equally good chance of correctly answering the entire test. Content validity of the individual questions was established through



literature reviews and input from nursing pain experts. The K-R-20 reliability and coefficient were used to measure internal consistency. The results were 0.68 for the pilot study and 0.58 for the main study. While the main study results were lower than those of the pilot study, it was determined that the tool was moderately reliable. The pilot study was conducted at a site other than that of the main investigation. It was indicated that these results would have been higher if the tool had contained more items and had the groups being tested been more heterogenous.

Reliability for the short-answer questions was not established as no other study had used this format. Content validity of the short-answer questions was established through the literature and review by nursing experts in pain management (Fothergill-Bourbonnais & Wilson-Barnett, 1992).

For the main study, a convenience sample of 100 registered nurses was utilized. Participation was voluntary. Ninety-six of the subjects were female. The subjects ranged in age from 20 to 60 years. Seventy-two were between the ages of 20 and 30 years. The number of subjects declined proportionally in the higher age groups. The majority of the subjects received their basic nursing education in hospital-based schools of nursing. A total of 48 nurses were hospice based and 52 were intensive care based. Forty-eight nurses were classified as expert, each

having a minimum of three years experience in the specific area, and more than five years overall. Fifty-two nurses were beginners, each having had less than one year in the specialty. The majority of beginners had less than three years total experience. Both beginners and experts were randomly scattered between the specialty fields. A specific break down per specialty was not reported.

Over all results for the multiple choice portion of the instrument were identified as follows. The range of correct scores between subjects was 16% to 100%. As a group the intensive care nurses scored 55.3% correctly while the hospice nurses scored 67.5%. Experts across both areas collectively scored 62.7% while beginners scored 59.9%. Groups scores were compared using the Wilcoxon Mann-Whitney statistic. Comparison between intensive care and hospice nurses revealed a significant difference  $Z = -3.3176$ ;  $P < 0.001$ . This indicated that the hospice nurses functioned at a higher level than the intensive care nurses in pain management. No significant difference was identified between experts and beginners,  $Z = -1.1001$ ;  $P > 0.05$ . Specific multiple-choice question answers were not published.

The results of one question were thought to be particularly significant. This question asked nurses to indicate the probability of a patient becoming addicted to meperidine after receiving the drug every four hours for 10

days. Thirty-nine answered almost never which was the correct response. More experts were reported to have answered correctly than beginners although exact numbers were not reported. In a related question, 63 subjects knew that meperidine injected into the muscle has a shorter duration of action than morphine. Seventy nine percent of the hospice nurses answered this question correctly while only 48% of the intensive care nurses answered correctly.

The seven short answer questions were included to determine the subject's knowledge of areas important to pain management in more detail. The answers were examined to determine understanding of eleven terms. Each subject's understanding of each term was coded with a (+1) for a correct, or (0) for an incorrect/no answer. To be coded as correct, the response had to reflect a basic understanding of the subject, but did not require a text book description. Responses were randomly checked for acceptable answers by an expert in pain. Results of Chi-square analyses given in Table 1 indicated that the majority of nurses had a limited knowledge base of the areas addressed with the exception of endorphins, and they lacked a basic understanding of the mechanisms of pain (see Table 1).

The demographics/personal opinion portion of the instrument was designed to determine each subject's

Table 1.

Analysis of results for short-answer questions by ITU and hospice nurses

Short-answer	Number of ITU nurses who answered correctly (n=52)	Number of Hospice nurses who answered correctly (n=48)	X <sup>2</sup>	Significance
TNS	12	25	8.40	P<0.05
Endorphins	32	29	0.00	P>0.05, NS
Pain	17	15	0.00	P>0.05, NS
Pain	20	15	0.70	P>0.05, NS
Gate Control	7	12	4.39	P<0.05
Physical	17	22	1.45	P>0.05, NS
Addiction	28	28	0.15	P>0.05, NS
Acute pain	31	35	2.70	P>0.05, NS
Cancer pain	29	38	5.87	P<0.02
Diamorphine	7	24	15.13	P<0.001
Morphine	4	25	28.90	P<0.001

Note: From "A Comparative Study of Intensive Therapy Unit and Hospice Nurses' Knowledge on Pain Management" by Frances Fothergill-Bourbonnais, R.N., Ph.D., and Jenifer Wilson-Barnett, S.R.N., Ph.D., F.R.C.N., 1991, Journal of Advanced Nursing, 17, p. 366. Copyright by 1992 by F. Fothergill-Bourbonnais. Reprinted by permission (see Appendix C).

perceived adequacy and perceived acquisition of knowledge of analgesics and other measures of pain relief. These perceptions could then be related to their specialties and years of experience.

One question asked the nurses to rank their pain knowledge base as very poor, poor, fair, good or very good. These answers were also subjected to a Chi-square test. Overall results indicated the majority of the nurses felt their knowledge base was fair to poor. Initially the responses received were grouped into five rankings ranging from poor to very good. These were then assigned to the categories of beginner or expert. A second classification was then made between the intensive care and hospice nurses. Calculations using the groupings listed indicated no significant differences in several categories because less than five responses occurred in each category. As a result, the responses were collapsed into two ratings, good/very good and fair/poor. No nurse indicated a very poor knowledge base. The test was rerun utilizing this new, two category combination of responses. Seven intensive care and twenty-eight hospice nurses felt their knowledge base was good too very good, while 45 intensive care and 20 hospice nurses felt it was fair to poor  $\chi^2 (1, N = 100) = 22.9$ ,  $p < 0.001$ .

These results were significant in that the majority rated their knowledge base as fair to poor. Thirteen beginners and 22 experts felt their knowledge base was good to very good, while 39 beginners and 26 experts felt it was fair to poor  $\chi^2 (1, N = 100) = 4.76$ ,  $p < 0.05$ . These

results were viewed as having further significance because of the number of beginner and expert nurses who felt their knowledge base was fair to poor.

Subjects were asked to rate which nursing care activities they felt helped to alleviate pain, and to rank them in the order of their importance. All subjects indicated a belief that nursing care had a positive impact in this area. Individual results are as follows. Turning and position change was the most frequently applied intervention in both specialties and was chosen by 37 intensive care and 31 hospice nurses. Eighteen intensive care and 20 hospice nurses utilized reassurance. Aides such as cradles were identified by nine intensive care and ten hospice nurses as interventions applied with pain control in mind. Alternative methods of pain relief were identified by 12 hospice nurses and six intensive care nurses. None of the nurses identified visualization as a technique they employed. Two hospice nurses and no intensive care nurses used relaxation techniques. Three intensive care and five hospice nurses used massage and two from each specialty used distraction. One intensive care nurse applied therapeutic touch while no hospice nurse used this intervention. Guided imagery was used by two hospice nurses and no intensive care nurses. Application of TENS units or acupuncture was chosen by one hospice nurse. Wound support while moving was

utilized by 13 intensive care and three hospice nurses. Eight nurses in each category reevaluated pain and the effectiveness of analgesics for effect. Six intensive care and eight hospice nurses indicated they did careful initial assessments. Five intensive care and seven hospice nurses felt that activities as bathing, mouth care or shampooing hair were activities that relieved pain and were applied with that outcome in mind. One intensive care and 11 hospice nurses applied heat and cold for pain relief. Nine intensive care and one hospice nurse administered analgesics prior to painful procedures, while five intensive care and four hospice nurses gave explanations as to cause of pain and what would be done to relieve it. Four nurses from each specialty considered room temperature, lighting and noise as contributing to or reducing pain. One intensive care and four hospice nurses viewed pressure area care as a means to relieve pain.

Thirty-nine hospice and 49 intensive care nurses indicated they needed more knowledge in pain control while nine hospice and three intensive care nurses felt their knowledge base was adequate. Of those indicating the need for more knowledge, 25 hospice and 31 intensive care nurses felt this education should be provided by the facility inservice staff. Ten hospice and 11 intensive care nurses felt this was a self study issue. The remainder indicated

this form of education should be provided by the head nurse, the medical staff or the senior nursing staff of the individual units. .

The findings indicated nurses lacked basic pain/management knowledge. The majority of the subjects felt a need for further pain and analgesic education. Many of the nurses expressed concerns that as students they were not allowed input regarding pain management, which would suggest that they had little opportunity to learn pain management skills. It was suggested that students be given the opportunity to learn to assess and manage pain while in this role. These opportunities should include analgesics as well as application of nursing prescribed interventions. The unit environment and focus were identified as clearly influencing the nurses as they entered their specialty areas and progressed from beginner to expert. In this study the hospice environment showed greater influence in promoting application of alternative pain interventions.

Since Cohen's (1980) replication of the Marks and Sachar (1973) study, repeated studies by numerous investigators have implicated nursing in the problem of poor pain management. Cohen's study is important because it shows nursing researchers are beginning to recognize what previous research has been indicating, that nursing must accept its share of the burden of responsibility, and act to



remedy the continued existence of poor pain control in the hospital setting. The study is also a primary investigation as the investigators employed a different type of tool. No previous research utilizing a written statement could be found by the investigators. This is undoubtedly due to the difficulty in subjecting a written statement to statistical analysis. This design allows subjects to write a statement in response to a question, and as a result may shed new insight into the problem. This type of response allows the subject freedom to comment as he/she deems appropriate rather than selecting predetermined responses which may not describe exactly what the subject wishes to say.

In this study the investigators have begun to take the next step in the pain problem which is to investigate why nurses fail to recognize or address this problem, rather than studying the patient whose pain has been well documented.

The study was well thought out and conducted on a large enough scale to have some significance in its findings. Replicating this study and conducting similar studies will be a positive step toward making nursing research a practice oriented endeavor in the respect that this type of study is now trying to identify a cause for a problem that has been shown to exist in the hospital setting. Once a cause is identified, a solution will be much closer. It may also

lead toward eventual development of a nursing theory in pain control.

The finding that seems to be the most significant is that there is an overall lack of knowledge regarding current pharmacological and nonpharmacological therapy for pain control. The fact that hospice nurses seem to have a better grasp of alternative interventions for pain control rather than relying heavily on pharmacological approaches seems logical in view of the population they serve. Of the 100 total subjects, 65 acknowledged that their knowledge base of analgesics was fair to poor yet only 21 indicated they felt it was the nurse's responsibility to self study in order to improve this knowledge base. Based on this type of response, one would surmise that the nurses lacked motivation to improve their skills even in situations where self recognized deficits existed in the practice areas. Fothergill-Bourbonnais and Wilson-Barnett (1992) indicated that the work environment seemed to have a strong influence on learning pain management skills.

Summary:

Throughout this literature review, it was noted that all investigators concluded that pain control continues to be a problem. While the responsibility for this was divided between physicians, nurses and patients, the majority of studies placed extensive responsibility for this on the

nurse. While such a generalization is inappropriate based on a single study, reaching such a conclusion based on several studies allows researchers to generalize conclusions with more security. One must accept that a pattern seems to exist which indicates pain is poorly controlled and nursing shares significant blame for this. The questions which remain are, why do nurses do such a poor job of pain assessment and what can be done about it?

The primary problem now is to identify what, if anything, is lacking in the educational literature and backgrounds of practicing clinical nurses and educators so that pain control and assessment can be improved.

It seems appropriate to assume that nurses fail to recognize that they have an active role to play in pain assessment and management. Many continue to display the attitude that they simply follow the physician's instructions without actively analyzing and participating in the patient's pain management. In practice, nurses continue to rely heavily on analgesics for pain control while failing to recognize that they have alternative interventions they can prescribe to supplement analgesic pain control methods. Nurses fail to recognize that, within the written parameters set by the physician orders, they do administer analgesics based on their independent assessments (Donovan et al. 1987). As a result of failing to recognize this

responsibility, they have also failed to acquire a knowledge base regarding analgesics and dosage, as well as knowledge regarding therapies and the theories behind these therapies (Donovan et al. 1987).

The Research Questions:

The primary question addressed was: what are the perceived and actual knowledge bases of beginner and advanced, medical/surgical and emergency nurses, regarding the adequacy of their preparation in the theoretical aspects of pain and its management through pharmacological and nonpharmacological means?

Additional questions to facilitate answering the primary question include;

1. Was there a difference in the extent of pain theory and management knowledge demonstrated between the beginning and experienced nurses in either the medical/surgical or emergency nursing groups?

2. Were beginning and advanced medical/surgical and emergency nurses able to provide a correct written description of acute and chronic pain?

3. Were beginning and advanced medical/surgical and emergency nurses able to provide a correct written description of how TENS therapy functions to control pain?

4. Were beginning and advanced medical/surgical and emergency nurses able to provide a correct written description of endorphins?

5. Were beginning and advanced medical surgical and emergency nurses able to provide a correct written description of pain threshold and pain tolerance?

6. Were beginning and advanced medical/surgical and emergency nurses able to write a correct description of the Gate Control Mechanism of pain control?

7. Were beginning and advanced medical/surgical and emergency nurses able to write a correct description of physical dependence on drugs and drug addiction?

8. Were beginning and advanced medical/surgical and emergency nurses able to write a correct description of acute and chronic pain?

9. Were beginning and advanced medical/surgical and emergency nurses able to write a correct description of the action of heroin and morphine?

10. What was the difference between beginning and experienced medical/surgical and emergency nurses' ratings of their current knowledge of analgesics to the area of practice and level of experience?

11. Did beginning and advanced medical/surgical and emergency nurses feel their basic nursing education prepared them to deal with patients who were experiencing pain?

12. Did beginning and advanced medical/surgical and emergency nurses believe they need further education and skill in dealing with patients in pain?

13. According to the beginning and advanced medical/surgical and emergency nurses who identified a need for further pain management, who did they believe should provide this information?

14. Which nonpharmacological pain interventions are most frequently cited by medical/surgical and emergency nurses?

Definitions:

Beginner: a registered professional nurse with less than one year experience in a given specialty area.

Advanced: a registered professional nurse having more than three years experience in a given specialty area.

Pain: "pain is whatever the experiencing person says it is, existing whenever he says it does." (McCaffery, 1979, p.11)

Medical/Surgical Nurse: a nurse who is permanently assigned to medical/surgical units and who is responsible for direct care of patients assigned to these units for convalescing from medical and/or surgical procedures.

Emergency Nurse: nurses who are permanently assigned to the emergency department and who are responsible for

direct care of patients presenting to this area for triage assessment and intervention of their presenting problems.

Theoretical Aspects of Pain: knowledge of the physiological and psychological aspects of pain, its assessment and its management through pharmacological and nonpharmacological means. Registered professional nurses' scores on the Pain Knowledge and Assessment Questionnaire.

### CHAPTER 3

#### METHODOLOGY

##### Design:

This study was a replication of Fothergill-Bourbonnais & Wilson-Barnett's investigation (1992) to determine the theoretical knowledge base of nurses pertaining to the pharmacological and nonpharmacological aspects of pain and its management. This retrospective, descriptive study compared the theoretical knowledge base of nurses pertaining to the pharmacological and nonpharmacological aspects of pain and its management. This study compared Emergency and Medical/Surgical experts and beginning nurses. Questionnaires were used to elicit knowledge and personal opinions as well as demographic data.

##### Setting and Sample:

A County Hospital, located in the Midwest, was used as the study site. The hospital employs 80 to 100 registered nurses in its adult emergency facility and several hundred throughout the various medical/surgical units. The hospital is licensed for 1200 beds and usually operates with a daily census between 800 and 900 patients. This hospital is one



of the few remaining free facilities in the United States, primarily serving the indigent and low income population of the area. The nursing staff is a homogenous group representing many ethnic, cultural, and educational backgrounds.

A convenience sample of 64 full time nurses from medical/surgical and emergency departments completed questionnaires consisting of multiple choice and short answer open-ended questions.

Due to a temporary hiring restriction during the two years prior to this study, and an unexpected increase in availability of experienced registered nurses, very few nurses with less than one year of experience were available to participate in this investigation. Subjects were considered beginners if they had less than three years of continuous experience in the specialty, and expert if they had three years or more of continuous experience in one of the identified specialties. When dual experience in both specialties was identified, the current work environment was designated the specialty. The amount of time in the current assignment was used to determine expert or beginner status. Nurses working less than 40 hours per week were not included due to the difficulty of determining their expert or beginner status.

#### Data Collection Instruments:

The data collection instruments consisted of tools to access current knowledge, determine perceived adequacy and acquisition of knowledge, and a demographic data questionnaire. The tools to access current knowledge were obtained from the original investigator, F. Fothergill-Bourbonnais, R.N., Ph.D., and modified.

#### Pain Knowledge and Assessment Questionnaire:

The original study used a 12 item multiple choice questionnaire that tested knowledge of pharmacology, signs and symptoms of pain and incidences of addiction. An additional section of short-answer questions was included to determine knowledge of specific content areas in more detail. Alterations were made to the original questionnaire to facilitate drug name recognition by nurses in the United States. As a result Pethidine was changed to its equivalent Meperidine and Diamorphine to heroin. These alterations should cause no change in either reliability or validity of the questionnaire (see Appendix D). In a telephone conversation, Dr. Fothergill-Bourbonnais indicated that all drugs chosen for inclusion in the original study were commonly used in practice and subjects should be familiar with them. During this conversation Dr. Fothergill-Bourbonnais reiterated to the investigator that Pethidine is Meperidine, and Diamorphine is heroin. One

question concerned the use of Diamorphine (heroin), which is legally used in many countries for pain control. While not a legal medication in the United States, the results of its abuse as a street/recreational drug can frequently be seen in practice. The question was modified and retained to ascertain the knowledge base of nurses regarding the metabolism of this substance. Names of specific surgical interventions were changed to general statements such as abdominal surgery.

Demographic and Personal Opinion Data Questionnaire:

The copy of the tool received from the investigator did not contain the demographic data and personal opinion section containing questions relating the subjects' perceived adequacy and acquisition of knowledge. Utilizing the published findings, similar questions were developed and incorporated into the tool in order to obtain this information (see Appendix E). This was done for comparison between experience levels and specialty groups in the original study. Questions to elicit demographic information were further expanded to address the varying levels of nursing education found in the United States.

Written permission to utilize the tool was provided by the original investigator (see Appendix A).

Procedure:

Protection of Human Subjects:

Approval was obtained from the Grand Valley State University Human Subjects Review Committee, and from nursing administration at the hospital, which reviews all proposed nursing research in place of a formal review board.

Pilot Study:

A pilot study using the questionnaires and demographic data sheets was conducted with five registered nurses not associated with the study site. The tool was found to function as expected. The pilot study was also conducted to more accurately determine the length of time involved in explaining the study and completing the tool. The introduction and explanation was found to take approximately ten minutes and completion of the tool took between 20 and 30 minutes.

After the initial introduction and explanation of the study by the researcher in the ward conference room (see Appendix F), questionnaires were distributed to all nurses willing to participate and who met the criteria. Participation was on a voluntary basis with the understanding that withdrawal at any time was acceptable. Potential subjects who did not participate were thanked, and asked to return to their assigned work areas. All participating subjects were given a code number ranging from

one to 150 on a three-by-five index card with their questionnaires. The numbered cards were randomly shuffled prior to distribution. Participants were assured that all information would be kept confidential and that individuals would not be identifiable in the research report. The participants were asked to destroy the numbered card before returning to the work area. A research assistant collected the completed instruments.

Demographic data and personal opinion information pertinent to the subjects, their professional educations and experience was obtained. In addition, personal opinion related to the use of various nursing interventions for pain management were sought (see Appendix F).

All responses were stored on a computer disk. Hard copies were locked in a safety deposit box which was accessible only to the investigator. Hard data will be maintained for the requisite five year period before it is destroyed.

## CHAPTER 4

### RESULTS

#### Data Analysis:

The data were analyzed using the nonparametric tests used in the original study: the Mann-Whitney U test and Chi-square test. A normal distribution was not established.

The data collected from the multiple choice questionnaire allowed comparison of the knowledge levels of the group pairings: beginner and expert, emergency and medical/surgical nurses using the Mann-Whitney U test. The subjects' answers to the short answer questionnaire, nominally assigned a (0) for no answer/wrong answer and (+1) for a correct response, were tabulated and then analyzed for group differences using the Chi-square test. The answers to the personal opinion questionnaire were collected and expressed as percentages of the subjects polled. These were tabulated to compare simple percentages.

#### Characteristics of Subjects:

A total of 64 nurses participated in this study, 33 from the medical/surgical areas and 31 from the emergency

area. The subjects represented a demographically diverse population in age, education and experience (see Table 2).

Table 2.

Demographic Characteristics of Subjects:

	Medical/			
	Surgical	Emergency	Beginner	Expert
	N=33	N=31	N=30	N=34
Sex				
Male		5		5
Female	33	26	30	29
Age				
21-30 years	7	4	7	4
31-40 years	9	9	12	6
41-50 years	10	9	11	8
51-60 years	3	1		4
Declined	4	8		12
Education				
Diploma	15	14	3	26
AND	10	13	20	3
BSN	8	4	7	5

Current Knowledge:

Generalized Nursing Knowledge:

The multiple choice questionnaire tested knowledge of pharmacology, signs and symptoms of pain and incidence of

addiction. The mean correct answers on the multiple choice questionnaire for the entire sample was 4.5 out of a possible 12, or 37.5% correct. The mean score for the emergency nurses was 4.9, or 40.9%; for the medical/surgical nurses it was 4.12 or 34.3%. The mean score for beginners was 4.41, nearly identical to the mean score of 4.6 for the experienced nurses. Comparison of scores of medical/surgical and emergency nurses using the Mann-Whitney U test revealed a significant difference  $Z=-1.89$ ;  $P>0.05$ . This indicated the emergency nurses performed at a significantly higher level. There was no significant difference between the beginners and experts  $Z=-0.44$ ;  $P>0.05$ .

#### More Detailed Knowledge of Specific Areas:

Short answer questions were included to determine knowledge of specific content areas in more detail. Responses were evaluated using the same criteria as the original study in which, to be considered correct, the response had to reflect understanding of the term but did not require a text book description.

Subjects were most knowledgeable about the differences between acute and chronic pain. Acute pain was correctly described by 63% of the subjects, with both medical/surgical (64%) and emergency nurses (61%) having almost identical results. Chronic pain was correctly described by 64% of the



subjects, with medical/surgical nurses having a slightly higher raw score (70%) than emergency nurses (58%). This was not, however, a significant difference. Conversely, subjects were least knowledgeable about pain threshold and pain tolerance. The difference between drug addiction and drug dependence was correctly described by twice as many emergency nurses as medical/surgical nurses, however this was not significant at a  $P < 0.05$  level.

The only significant knowledge difference between medical/surgical and emergency nurses existed in the knowledge of morphine and heroin. Emergency nurses were significantly more knowledgeable about the use and actions of morphine than were the medical/surgical nurses  $\chi^2 (1, N = 64) = 5.11, P < 0.05$ . Some knowledge difference between emergency nurses and medical/surgical nurses also existed regarding heroin use.

The remaining specific content areas, TNS, endorphins and gate control were correctly described by almost equal numbers of medical/surgical and emergency nurses (see Table 3).

Table 3.

Analysis of Results for Short-answer Questions by  
Medical/Surgical and Emergency Nurses

Short-answer question	Number of	Number of	$\chi^2$
	Medical/Surgical nurses who answered correctly (n=33)	Emergency nurses who answered correctly (n=31)	
TNS	5	7	0.58
Endorphins	8	12	1.56
Pain Threshold	1	0	0.95
Pain Tolerance	1	1	0.95
Gate Control	4	6	0.63
Physical dependence	5	10	2.61
Drug addiction	6	11	2.45
Acute pain	21	19	0.04
Chronic pain	23	18	0.94
Heroin	4	10	3.79
Morphine	8	16	5.11*

\* Significant at  $P < 0.05$

In the original investigation, Fothergill-Bourbonnaise and Wilson-Barnett (1992) did not compare experts' and beginners' detailed pain knowledge addressed in the short answer questions. In a comparison accomplished for this study, no significant differences between these two groups were identified. Acute pain and chronic pain were both correctly described by 70% of the beginning nurses. Experienced nurses produced similar results for acute pain (56%) and chronic pain (59%). Morphine was correctly described by 47% of the beginning nurses and 29% of the experienced nurses. (see Appendix G).

#### Perceived Adequacy and Acquisition of Knowledge:

##### Perceived Knowledge of Analgesics:

The majority in all groups rated themselves as good/very good on their current knowledge of analgesics. The results (see Table 4) indicated no significant differences between medical/surgical and emergency nurses or between beginners and experts.

Table 4.

Nurses Ratings of Their Current Knowledge of Analgesics.

Categories	Area		Experience	
	Medical/ Surgical	Emergency	Beginners	Experts
	(n=33)	(n=31)	(n=30)	(n=34)
Good/Very Good	24	18	19	23
Fair/Poor	9	13	11	11
$\chi^2 =$	1.52, $P>0.05$		0.13, $P>0.05$	
	Not significant		Not significant	

Perceived Adequacy of Basic Education:

The majority of nurses in this study (70.6%) believed that their basic education prepared them adequately to care for patients in pain (see Table 5). Comments from the 28.4% of the respondents who believed that their education did not adequately prepare them included: "pain is so important it should be a specific subject within the curriculum"; "students should have more clinical experiences specifically caring for patients in pain"; and "pain is such an abstract subject that it is impossible for the young individual to grasp it and so teaching it in the curriculum setting is not

possible, only personal life experiences allow one to learn this concept".

Table 5.

Nurses Perceptions of the Adequacies of Their Basic Educational Preparations.

	Subjects	
	Medical/Surgical	Emergency
Responses	n=33 (%)	n=31 (%)
Yes	26 (79%)	21 (68%)
No	7 (21%)	10 (32%)

Nurses were asked to state whether they believed that they needed additional knowledge in the area of pain management. A majority (72%) felt that this was a need (see Table 6).

Table 6.

Nurses Perceptions of Their Need for Additional Knowledge:

	Subjects	
	Medical/Surgical	Emergency
Responses	n=33	n=31
Yes	23	23
No	10	8

Perceived Need for Provision of Additional Knowledge:

A total of 44% of all subjects felt further education was the responsibility of the employer to provide through inservice education. The next most frequent response was self study (14%) and then attending seminars (5%) (see Table 7).

Table 7.

Nurses Top Three Perceptions of How Additional Education Should Be Provided.

	Subjects	
	Medical/Surgical	Emergency
Responses	n=33	n=31
Inservices	17	11
Seminars	2	1
Self-Study	2	7

Knowledge of Nursing Interventions Gained from Experience.

The two experiences the subjects selected as most influential in learning about nursing interventions for pain management were: clinical work since graduation and classroom content prior to graduation. The clinical work

since graduation was considered to be the most influential by both emergency beginners and experts, and medical/surgical beginners. The medical/surgical experts were slightly more inclined to think classroom content prior to graduation was the most influential. Other less frequently cited factors were personal pain nursing experience and clinical experience prior to graduation.

Table 8.

Experiences Selected as Being Most Influential in Learning About Nursing Interventions

Responses	Subjects			
	Medical/Surgical		Emergency	
	n=33	(%)	n=31	(%)
Clinical Work Since				
Graduation	14	(42%)	17	(55%)
Classroom Content Prior				
to Graduation	12	(36%)	9	(29%)
Personal Pain Nursing				
Experience	7	(21%)	7	(23%)
Clinical Experience				
Prior to Graduation	6	(18%)	8	(26%)

### Knowledge of Nonpharmacological Aspects of Pain

#### Management:

Subjects were expected to rank all interventions listed, but the majority only ranked five or less. Careful pain assessment was the nonpharmacological intervention cited most often by both medical/surgical and emergency nurses. The next most frequent nonpharmacological intervention cited by emergency nurses was evaluation of analgesic effects with the patient. Medical/surgical nurses selected explanation of pain or what is to be done before a procedure. Reassurance was the fourth most frequently cited nonpharmacological intervention. The only other intervention cited with any frequency was reassurance. A pharmacological intervention, administration of analgesics was included in the list of possible nursing interventions. It was the second most frequently chosen intervention overall, however due to its being a pharmacological intervention it was not ranked with the nonpharmacological interventions. Medical/surgical nurses were more focused on explanations and environment while emergency nurses were more action oriented (see Table 9).



Table 9.

Most Frequently Applied Nonpharmacological Aspects of Pain Management

Intervention	Subjects		Emergency n=31 (%)
	Medical/Surgical n=34	(%)	
Careful pain assessment	21	(64%)	20 (65%)
Administration of analgesics	18	(55%)	19 (61%)
Evaluation of Analgesics	9	(27%)	17 (55%)
Explanations	17	(52%)	7 (23%)
Reassurance	8	(24%)	11 (35%)
Environmental control	10	(30%)	2 (6%)
Positioning	7	(21%)	3 (10%)
Relaxation	4	(12%)	4 (13%)
Visualization	2	(6%)	1 (3%)
Application of heat or cold	*		3 (10%)
Pressure area care	2	(6%)	*
Massage	1	(3%)	1 (3%)
Teaching wound support	*		1 (3%)
Therapeutic touch	*		2 (6%)
Distraction	*		1 (3%)
Guided imagery	*		1 (3%)
Aids to direct care	*		1 (3%)
Activities of daily living	*		*

\* Not Ranked

## CHAPTER 5

### DISCUSSION AND IMPLICATIONS

Prior to the Fothergill-Bourbonnais and Wilson-Barnett (1992) study there had been no research undertaken to study nurses' knowledge regarding pain theory and its management. Several investigators including Cohen, (1980), Meinhart and McCaffery, (1983), and McCaffery and Beebe, (1989) suggested that nurses' lack of knowledge in the area of pain management is a major contributor to the ongoing pain problem. Because this is a new area of research, comparisons can only be accomplished using the Fothergill-Bourbonnais and Wilson-Barnett (1992) study.

#### Comparison of Subjects' Professional Educations:

A comparison of the educational levels of the subjects in the original study with those of the replication differed significantly. In the original study, the vast majority of subjects received their basic nursing education in programs established and maintained by the London teaching hospitals. The sample for this replication described a population that included three levels of nursing education (A.D.N., Diploma, and B.S.N.) as well as multicultural backgrounds.

#### Comparison of Locations of Investigations:

The sites of the original study consisted of intensive acute care and long term hospice care facilities. The site of the replication was a county maintained, acute care hospital serving a primarily indigent and low income population where the emphasis was on short term care.

#### Comparison of Work Environments of Subjects:

The two nursing specialities in the original study, hospice and intensive therapy, were concerned with patients who required significantly different types of pain management. One group of subjects was involved in the care of long term, terminally ill, hospice patients. The other group's patient load consisted of short term, critical care patients in an intensive care setting. In the replication study both subject groups dealt with relatively short term care situations in which any one nurse might reasonably expect to care for an individual patient for only one shift during that patient's hospital stay.

#### Similarity of Findings of Original and Replication Studies:

The subjects in the Fothergill-Bourbonnais and Wilson-Barnett (1992) investigation were shown to lack both overall pain theory and management knowledge. The replication subjects displayed a similar lack, both between emergency and medical/surgical nurses and between beginners and experts.

In the replication study, results of the pain questionnaire which tested pharmacological knowledge were similar to the results of the original study. The performance of subjects within the two different specialties in both studies was significantly different, while no significant differences were found between the beginners and experts.

Subjects in both studies acknowledged a need for additional knowledge and skills in pain management and felt this knowledge should be provided primarily through the employer's inservice education facilities.

#### Differences of Findings in Original and Replication Studies:

The participants in the original Fothergill-Bourbonnais and Wilson-Barnett (1992) study felt that their basic education did not adequately prepare them for pain management. The investigators concurred. Subjects in the replication study rated their basic education as good to very good in this area, while the replication investigation revealed a significant perceived lack of knowledge within all subject groups (see Table 5). Results indicated a great disparity existed between subjects perceived adequacy of their basic nursing education in the area of pain and its management and what was found to be their current knowledge base.

Overall, the results indicated that all subjects in the replication study displayed a more limited knowledge base than was found in the original investigation in the areas of: TNS, endorphins, pain threshold and tolerance, the Gate Control Theory, physical dependence, addiction, acute and chronic pain, and the difference between heroin and morphine. No significant difference was identified in these areas between the emergency and medical/surgical nurses in the replication investigation except one. The emergency nurses displayed a significantly better understanding of morphine than did the medical/surgical nurses. Although the Chi-square statistic was slightly lower than the critical value needed ( $\chi^2 = 3.79$  versus  $\chi^2 = 3.84$  for the level of significance set at  $P < 0.05$ ), the problem of heroin, its pharmacological makeup and use as a legal drug in some countries, as well as potential for abuse where it is illegal, was felt important enough to warrant inclusion and discussion. The answers of the emergency and medical/surgical nurses to the short answer questions contrasted with the original study in which a significant difference was found between nurses from the intensive care and hospice specialties in five subject areas including TNS, Gate Control Mechanism, cancer pain, acute pain, Diamorphine (heroin) and morphine. Why this difference in knowledge exists is unknown. Considering the common denominators

between all subjects one must consider that nurses educated in England may receive more extensive educational preparation in the area of pain management than is received by their counterparts in the United States.

Problems Encountered During Replication Data Collection:

Polit and Hungler (1995) indicate that all nonexperimentally designed studies must accept a risk of competing explanations for outcome findings. In order to control the potential effects of variables which could have influenced the internal and external validity of the study, the planned sequence for the data collection process had been to give the verbal introduction and explanations and collect the completed tools in one session. Threats to the internal validity of the study included history and selection related factors. Threats to the external validity of the study included the Hawthorne and Experimenter effects as well as the inability to generalize the finds to the target population at large.

Problems related to history began to occur at the start of the study. The facility administrators determined that subjects could not be away from the bedside long enough to accomplish the introduction, explanation and data collection at one time. It was determined that the subjects could leave their assigned work areas only on an individual basis to attend the estimated ten minute introduction and

explanation. Subjects could then either complete the tool while on duty, if there were no immediate patient care demands, or on their own time.

Within two weeks after the initial distribution of 150 tools, 45 were returned. Of these three were incomplete and two were illegible. These five tools were eliminated from the results and destroyed. For the next six weeks no additional tools were returned regardless of numerous verbal and written requests by the researcher to the research assistants and nursing administration.

In order to obtain a minimally adequate number of usable tools (60) a second distribution was undertaken by one of the research assistants. This second distribution resulted in 24 additional usable tools being obtained.

Several factors occurred during the data collection period. The locality experienced an unusually long period of intense heat and high humidity which placed an additional burden on the facility and staff. It was after this period that the final 24 completed tools were obtained.

Another variable which could have had some influence was the fact that the hospital had conducted its own pain management research project just prior to this study. Subjects who had participated in the previous study may have erroneously concluded that this study was somehow involved

with the previous one, and further participation was not necessary.

The subject selection process threatened internal validity as participation was voluntary from an easily accessible population. Nurses who were willing to participate were given a copy of the tools and a numbered identification card. Participants were asked to complete the tools and return them to a research assistant who was chosen by the administration, and assigned to each participating unit. The research assistants were to return the completed tools to the researcher.

Factors which influenced the external variables of the study includes the Hawthorne effect (Polit & Hungler, 1995). This influence was probably minimal as many research projects are underway within this facility at any one time.

The response of the subjects to the researcher may have affected the results. The researcher was told by several participants during the introduction and explanation sessions that only because of positive personal feelings of the participant toward the researcher was the participant willing to be involved in the study. Research assistants who were assigned the task of functioning in that capacity may have viewed the study and tasks involved as an unwanted responsibility and projected a negative researcher attitude through association. The persistence of the voluntary



research assistant who accomplished the second data collection may have projected a positive attitude.

### Conclusions:

This study supported the conclusions of the original investigation which identified inadequate educational preparation of nurses in the current theories and practices involved in the care of patients in pain.

The replication study identified continuing education through inservice education, seminars, self study and clinical experience with patients in pain after graduation as the means by which nurses most frequently gain new pain management knowledge. Fothergill-Bourbonnais and Wilson-Barnett (1992) identified that once new knowledge is obtained, the work environment must then be conducive to its actual implementation. This suggests an explanation of why the nurses in the original study who were working in the hospice setting were better able to learn, suggest, teach and apply alternative approaches than were the nurses who were working in the acute care settings. It is also a possible explanation for why the subjects in the replication study failed to display a significant difference in their knowledge bases.

Weaknesses in the replication study include the limited number of participants and the use of a convenience sample from a single facility. The extended time for data

collection may have allowed external variables to influence the results. These weaknesses combined with the use of relatively new research tools suggest that the findings can only be applied to the participants.

Because the majority of the subjects neglected to answer the question regarding the total number of years of nursing experience they possessed, no conclusions regarding total length of nursing experience and subjects' pain knowledge base are possible.

This replication study contributed to the validity and reliability of the tool. Due to the scattered and dissimilar answers found it is presumed, although not proven, that the participants did not confer on answers and did not seek to find answers in texts. These two external variables were of great concern but do not appear to have altered the results. Searching of texts for correct responses should have resulted in a much higher correct response rate than was found, and conferring on answers should have shown a pattern of clustered responses which was not identified. It is therefore presumed that the majority of responding subjects did complete the tool in an independent fashion.

In both studies no significant difference was found between beginning and experienced nurses. This suggests that education in pain management is improving in the formal

educational setting, and that recent graduates are being taught what current experts were left to learn on their own.

Recommendations For Education, Administration and Practice:

Despite the limitations of this study, further research into pain management knowledge and educational improvements is recommended. In addition to improvements in formal nursing education, regular and ongoing inservice presentations on new developments in pain management and independent attendance of pain management seminars are encouraged.

Administrators have responsibility for insuring that all activities have positive legal and financial outcomes. This study confirmed earlier findings which suggested that overall, nurses lack knowledge regarding pain and its management. As a result, theory based pain management policies should be developed to ensure that activities of the nursing staff are economically and legally justified. Furthermore administrators should institute policies which encourage nurses to acquire new knowledge and apply it to practice. Administrators should determine which nursing activities have the greatest financial impact, and encourage nurses to improve their practices accordingly. The use of theory based policy and practice serves as a means upon which to evaluate levels of individual practice and as a measure upon which to establish a reward system including

salary increases, letters of appreciation, citations for excellence in practice and peer recognition.

Practitioners must recognize personal knowledge deficits and the need for nursing to move forward from the physician directed role, to the independent practitioner role. Nurses must recognize that nursing knowledge is expanding at a very rapid rate, necessitating ongoing updating of the individual practitioner's knowledge base in all aspects of health care rather than relying on a formal education, which might be several years old, and ongoing clinical experience to remain abreast of recent developments.

#### Recommendations for Further Research:

It was suggested by Fothergill-Bourbonnais and Wilson-Barnett (1992) that the work environment of the hospice setting might be more accepting and conducive for nurses to suggest and implement alternative pain management interventions than that found in an intensive care setting. The two areas utilized in the replication study were both acute care. Both subject groups in the replication study displayed similar deficiencies in their pain knowledge base which were similar to that of the hospice nurses in the original study. This further suggests that some factor may be preventing acute care nurses from learning about, or applying, alternative interventions.

Another area for further research might include closer comparisons of the educational approaches currently available in the United States with those currently in use in Great Britain. As was suggested in the Fothergill-Bourbonnais and Wilson-Barnett (1992) study, there is a need for further investigation into specific, current nursing knowledge so that current strengths are maintained while weaknesses are identified and corrected.

Repeated replications of this and similar studies is encouraged. Additional replications are needed to identify similarities and patterns in findings which prove or disprove the value of the tool in determining nursing knowledge of pain.

Methodological improvements to be considered for future research includes utilizing a larger and randomly selected sample and collecting data from a wider geographic area. Because of the difficulties encountered in collecting data from subjects while they are on duty, alternative sites might include professional meetings, graduate schools, or other health care facilities such as long term care facilities or free standing home health agencies. Another improvement would be to reduce the length of time over which data is collected. This would improve control over external variables. Additional groups of nurses, both in practice and educational preparation, need to be compared in an

attempt to determine which groups demonstrate good to very good and poor to very poor pain knowledge. Further investigations could then be undertaken to identify commonalities between groups representing each level of pain related knowledge. Repeated replication of the original study should be undertaken to continue to establish reliability and validity of the tools.

#### Replication Study Applied to the Conceptual Framework:

Theories are not proven fact, but a means to explain and visualize phenomena (Polit & Hungler, 1995). Polit and Hungler (1995) also indicate that a theory must be congruent within a culture's values and philosophical orientation. When values change, a theory may be discarded or become more applicable. In the current cultural value system of controlling health care costs, individuals are being asked to accept increased responsibility for self and dependent care. Orem's Self Care Theory (1995) attempts to explain the activities, knowledge and skills that constitute nursing. Through the application of this theory the nurse is able to teach needed skills which facilitate self and dependent care. Melzack and Wall's (1983) Gate Control Theory of Pain is a means of understanding the discomforts of the injured or ill individual. Through teaching of alternative interventions for improving pain management as suggested by the Gate Control Theory (Melzack & Wall, 1983)

the nurse assists the individual to move from the Wholly or Partially Compensatory level of dependence on a health care provider to the less costly Educative Supportive level of self care. This guiding of the individual into low cost self sufficiency is in keeping with the current cultural value system.

The nurse as a teacher and care giver should participate equally with the physician and the patient, forming a team with primary responsibility for pain management. Within this team all participants share equal responsibility to communicate success or failure to the other members. Interventions are chosen and implemented using all available information. In this replication study as well as the Fothergill-Bourbonnais and Wilson-Barnett (1992) study it was found that nurses demonstrated a poor understanding of pain and its management. Because of this lack of understanding, the nurses failed to apply theoretical concepts both in the practice of nursing and in the management of pain. When the nurse does not recognize and teach the application of potentially useful interventions, the individual's progress in resuming self/dependent care responsibilities is significantly hindered. Through the Fothergill-Bourbonnais and

Wilson-Barnett (1992) study as well as the replication study, a small step has been taken toward identifying causative factors for poor pain management.

The application of theory as a basis for practice moves nursing out of the technical, vocational, "following orders" mentality into a framework of an independent thinking contributor to the health care team. This grounding of decisions in theory makes nursing a professional practice. The results of the original, as well as the replication, study indicate this is not occurring and that pain management remains on the technical level. Because technical level nursing is driven by physician orders the problem comes full circle. The physician who lacks knowledge in pain management (Marks & Sachar, 1973) fails to adequately manage pain and the nurse also lacking this knowledge (Cohen, 1980; Camp & O'Sullivan, 1987; Donovan et al. 1987; Choiniere et al. 1990; Owen et al. 1990; Fothergill-Bourbonnais & Wilson-Barnett, 1992) fails to move beyond physician directives. The patient/dependent care giver, having no idea what to do, is unable to implement self/dependent care.

Fothergill-Bourbonnais and Wilson-Barnett (1992) suggested that factors involved in the acute care setting contribute to the environment of the facility. In the original study it was found that one group of subjects in



the acute care setting demonstrated a significantly poorer understanding of pain than those of subjects employed in the hospice setting. Fothergill-Bourbonnais and Wilson-Barnett (1992) identified a better level of nursing knowledge regarding pain in the hospice group than the intensive care nurses. In the replication study all subjects functioned in an acute care setting. These subjects displayed a poorer understanding of pain than either of the Fothergill-Bourbonnais and Wilson-Barnett (1992) study groups. The only significant difference was that the emergency nurses demonstrated a better understanding of morphine than did the medical/surgical nurses. Some factor common to the acute care facilities not found in the hospice setting may have affected three of the four groups in both the Fothergill-Bourbonnais and Wilson-Barnett (1992) and this replication study. The acute care nurses continue to function in a technical manner while hospice based nurses display a more theory based professional approach to pain management.

The results of this study indicated that while pain remains a problem and lack of knowledge of pain is a major contributor to that problem, nursing knowledge is improving. Inexperienced nurses displayed pain knowledge equal to that of experienced nurses, knowledge which could only have been

obtained in school. Nursing is moving forward in addressing the problems of pain management.

## APPENDICES

## APPENDIX A

### LETTER OF PERMISSION TO REPLICATE STUDY



UNIVERSITÉ D'OTTAWA  
UNIVERSITY OF OTTAWA

---

FACULTÉ DES SCIENCES DE LA SANTÉ  
FACULTY OF HEALTH SCIENCES

November 25, 1993

Joanne O'Borski  
506 North Park Road  
La Grande Park  
Chicago, Illinois 60525  
U.S.A.

Dear Joanne,

Please find enclosed a copy of the tool utilized in the study published in Journal of Advanced Nursing 1992, vol. 17.

You are most welcome to utilize this tool in your proposed Masters' thesis, acknowledging the source of the tool.

Good luck with your thesis and please forward me a copy of your results.

My mailing address is:

Dr. Frances Fothergill-Bourbonnais  
School of Nursing  
Faculty of Health Sciences  
University of Ottawa  
451 Smyth Road  
Ottawa, Ontario K1H 8M5

*Sincerely,*

Dr. Frances Fothergill-Bourbonnais  
Associate Professor  
Tel.: (613) 787-6471

ÉCOLE DES SCIENCES INFIRMIÈRES/SCHOOL OF NURSING  
451 SMYTH, OTTAWA, ONTARIO, CANADA K1H 8M5  
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## APPENDIX B

### LETTER OF PERMISSION TO REPLICATE FIGURE

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## APPENDIX C

### LETTER OF PERMISSION TO REPLICATE TABLE 1



Université d'Ottawa • University of Ottawa

Faculté des sciences de la santé  
École des sciences infirmières

Faculty of Health Sciences  
School of Nursing

April 27, 1995

JoAnn Oborski  
506 North Park Road  
LaGrange Park, IL 60525  
USA

Dear Ms Oborski,

This letter pertains to your request to reproduce Table 1: 'Analysis of results for short-answer questions by ITU and hospice nurses' from the journal article entitled: A Comparative Study Of Intensive Therapy Unit And Hospice Nurses' Knowledge On Pain Management by Frances Fothergill Bourbonnais and Jenifer Wilson-Barnett published in 1992 in the Journal of Advanced Nursing, 17, 362-372. I understand that this table will be reproduced in your Masters thesis and will be placed on permanent file with University Microfilms, Inc (UMI), Ann Arbor, Michigan and that UMI may supply single copies of this material on demand.

Permission to reproduce this table is granted.

Sincerely,

Frances Fothergill Bourbonnais, RN, PhD.  
Associate Professor

451, ch. Smyth Ottawa (Ontario) K1H 8M5 Canada  
451 Smyth Rd Ottawa, Ontario K1H 8M5 Canada  
(613) 287-6596 • Telex: Fax (613) 287-6257

## APPENDIX D

### PAIN KNOWLEDGE AND ASSESSMENT QUESTIONNAIRE

Please complete the following questionnaire. Do not put your name on this questionnaire. The number displayed in the upper right-hand corner will identify you for this study. There is no time limit.

A. Multiple Choice Questions:

Please circle the one best answer in questions' 1-12.

1. If a patient is suffering from severe pain, the drug that would most likely be administered to relieve this pain would be:

- a. morphine;
- b. vecuronium bromide;
- c. meperidine;
- d. methadone;

2. If a 50 Kg. (110 lb.) female patient is given meperidine 100 mg. intramuscularly for post operative pain, you would expect this patient to feel the maximum effect of this drug in:

- a. 10 minutes;
- b. 40 minutes;
- c. 70 minutes;
- d. 100 minutes;

3. If the patient in question two was given meperidine 100 mg. in tablet form, the maximum effect would be felt by the patient in:

- a. 10 minutes;
- b. 40 minutes;
- c. 70 minutes;
- d. 100 minutes;

4. If a cancer patient is beginning to suffer pain caused by tumor infiltration of bone, initial drug therapy considered for this patient would be:

- a. tylenol with codeine;
- b. naprosyn;
- c. morphine;
- d. meperidine;



5. If meperidine 100 mg. is given intramuscularly every four hours as post-operative analgesia for ten days to a multiple trauma patient, what is the possibility that this patient would become addicted to the narcotic?

- a. almost never;
- b. sometimes;
- c. often;
- d. almost always;

6. The nurse may observe the following signs and symptoms in a patient experiencing acute pain:

- 1. decreased pulse,
- 2. protective movement,
- 3. increased diastolic and systolic blood pressure,
- 4. dry skin,
- 5. nausea,

The answer to question six is a combination of the above signs and symptoms:

- a. 1,2,3;
- b. 1,2,4;
- c. 2,3,5;
- d. 3,4,5;

7. Which of the following is adequate analgesia for a 70-year-old 82 Kg. (180 lb.) patient during the first day after major abdominal surgery?

- a. meperidine 50 mg. every four hours PRN?
- b. meperidine 100 mg. every four hours PRN?
- c. meperidine 50 mg. every three hours PRN?
- d. meperidine 100 mg. every three hours PRN?

8. A 60-year-old female patient returns to the unit from the recovery room following an abdominal-perineal resection and is complaining of severe abdominal pain. You note that the patient received a total of morphine four mg. intravenously while in the recovery room. When should you administer further analgesic to the patient?

- a. within 15 minutes after returning to the unit.
- b. 30 minutes after returning to the unit.
- c. one hour after returning to the unit.
- d. two hours after returning to the unit.
- e. two to four hours after returning to the unit.

9. If a patient with cancer of the colon and metastases was admitted in severe pain, which analgesic would he/she most likely receive initially?

- a. meperidine 75-100 mg. IM every four hours PRN;
- b. codeine 10-20 mg. IM every four hours PRN;
- c. morphine 5-15 mg. PO every four hours PRN;
- d. morphine 90 mg. PO twice daily;

10. If a doctor writes a prescription for meperidine 50-100 mg every three to four hours PRN for an adult male patient weighing 72 kg. (158 lbs.) with fractured pelvis and two fractured ribs following a hit and run accident, which dosage should be given to this patient?

- a. meperidine 50 mg every three hours PRN;
- b. meperidine 75 mg every four hours PRN;
- c. meperidine 100 mg every three hours PRN;
- d. meperidine 100 mg every four hours PRN;

11. Which is the most important factor you would consider in making the decision as to the next dosage to give the patient in question ten?

- a. the time since the last dose;
- b. the effectiveness of the previous dose;
- c. the weight of the patient;
- d. the age of the patient;

12. Meperidine when administered intramuscularly to a patient in pain has a duration of action:

- a. shorter than that of morphine;
- b. equivalent to that of morphine;
- c. longer than that of morphine;
- d. it is not possible to compare narcotics in this manner;

B. Short answer questions:

The following questions require written answers. Your answers need not be text book answers and require only that you demonstrate basic knowledge about the subject. Please limit your answers to one or two sentences.

1. Have you heard of Transcutaneous Electrical Nerve Stimulation?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, what you know about T.N.S?

2. Is the term endorphin familiar to you?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, describe endorphin.

3. Is there a difference between pain threshold and pain tolerance?

Yes\_\_\_\_\_ No\_\_\_\_\_

If yes, please explain the difference.

4. Have you heard of the Gate Control Mechanism of pain?

Yes\_\_\_\_\_ No\_\_\_\_\_

If yes, where did you learn this? Can you describe this mechanism in your own words?

5. What is the difference, if any, between physical dependence on drugs and drug addiction?

6. What is the difference, if any, in the characteristics of acute and chronic pain?

7. Describe, in your own words, the difference between heroin and morphine.

## APPENDIX E

### DEMOGRAPHIC AND PERSONAL OPINION DATA

Place your code number in the upper right-hand corner of this page and complete the following demographic data.

1. Your sex? (optional)

- a. male
- b. female

2. Your age? (optional)

- a. Under 20
- b. 20-30
- c. 30-40
- d. 40-50
- e. 50-60
- f. More than 60

3. Type of Basic Professional Nursing Education?

- a. B.S.N.
- b. A.D.N.
- c. Diploma

4. Highest nursing degree held?

- a. Ph.D.
- b. M.S.N.
- c. B.S.N.
- d. A.D.N.
- e. Diploma.

5. Total number of years (months if less than one year) nursing experience?    Years\_\_\_\_\_ Months\_\_\_\_\_

6. Total number of years (months if less than one year) nursing experience in the specialty area?

ER: Years\_\_\_\_\_ Months\_\_\_\_\_

MS: Years\_\_\_\_\_ Months\_\_\_\_\_

7. Your current area of employment?

- a. emergency
- b. medical/surgical

This section of the questionnaire requires your opinion.

Circle the appropriate response in question eight.

8. Rate your current knowledge of analgesics.

1. good/very good

2. fair/poor

9. The following is a list of 18 nursing interventions a nurse might apply in pain control. Rank these interventions as #1 most valuable through #18 least valuable for application as a pain control measure.

....A. position change

....B. reassurance, talking and listening

....C. aids to direct care as the use of cradles and  
foam mattress pads

....D. visualization

....E. relaxation

....F. massage

....G. distraction

....H. therapeutic touch

....I. guided imagery

....J. teaching wound support when moving

....K. evaluation of analgesic effects with the patient

....L. careful pain assessment



- ....M. activities of daily living: brushing teeth,  
washing hair
- ....N. application of heat or cold
- ....O. administration of analgesics before painful  
procedures
- ....P. explaining pain or what is to be done before  
a procedure
- ....Q. providing a relaxing environment with  
well-controlled temperatures comfortable to the  
patient
- ....R. pressure area care

From the previous list identify which four interventions you employ most often in your practice. Please identify them in the order in which you most frequently apply them.

1.\_\_\_\_, 2.\_\_\_\_, 3.\_\_\_\_, 4.\_\_\_\_

10. Which of the following experiences or factors helped you to learn about nursing interventions for pain relief, pharmacological knowledge of analgesics, and the physiology of pain impulse transmission.

Please rank the following in order of importance  
most important (1) least important (10):

- .... a. clinical work with patients since graduation
- .... b. classroom content prior to graduation
- .... c. head nurse

- .... d. personal pain nursing experience
- .... e. other staff members
- .... g. clinical experience prior to graduation
- .... h. continuing education courses
- .... I. your current work environment
- .... j. in-service education classes
- .... k. self-study

11. Do you feel your basic nursing education adequately prepared you to help patients in pain?

- a. yes
- b. no

If not, what suggestions do you have to improve the current level of nursing education in this area?

12. Do you believe you need more nursing knowledge and skills in the care of the patient in pain?

- a. yes
- b. no

If no where did you attain the knowledge and skills to care for the patient in pain?

If yes, from where do you believe this knowledge and skill should be provided?

(with permission F. Fothergill-Bourbonnais R.N., Ph.D. 1992.

## APPENDIX F

### VERBAL INTRODUCTION

My name is Jo Ann Oborski. I am a registered nurse and am currently pursuing an M.S.N. degree from Grand Valley State University, Allendale, Michigan. As part of the requirements for completion of this degree I am conducting a research study to identify nurses knowledge in regards to pain, its assessment and control.

You will be asked to complete a questionnaire designed to establish your current knowledge level regarding theories of pain and its management through pharmacological and nonpharmacological means. You are free to withdraw from the study at any time prior to, or during, the data collection process. There will be no personal benefits or risks to you for participating. There will be future benefits to patients in that this study will provide information for better pain control. The investigator will be available to answer specific procedural questions prior to data collection.

The information you provide will be kept in strictest confidence. Answers will be transferred to a computer for

statistical manipulation. All forms will be shredded at the end of the study. Your name should not appear on any form. Please discard the three-by-five index card showing your number after completing the questionnaire and demographic data sheets.

## APPENDIX G

### Analysis of Results for Short-answer Questions by Beginning and Experienced Nurses

	Number of beginning nurses who answered Short-answer question	Number of Experienced nurses who answered correctly (n=34)	$\chi^2$
TNS	5	7	0.16
Endorphins	9	11	0.04
Pain Threshold	1	0	1.15
Pain Tolerance	1	0	1.15
Gate Control	6	4	0.82
Physical	8	7	0.33
Addiction	10	7	1.33
Acute pain	21	19	1.36
Chronic pain	21	20	0.86
Heroin	8	6	0.76
Morphine	14	10	2.02

## LIST OF REFERENCES

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- Agbababian, R. (1986). Emergency pain management. Emergency Care Quarterly, 2(2), 12-21.
- Bodanis, D., (1984). The body book. Boston: Little, Brown and Company.
- Camp, D. (1988). A comparison of nurses' recorded assessments of pain with perceptions of pain as described by cancer patients. Cancer Nursing, 11(4), 237-243.
- Camp, D., O'Sullivan, P., (1987). Comparison of medical, surgical and descriptions of pain and nurses' documentation of pain assessments. Journal of Advanced Nursing, 12, 593-598.
- Choiniere, M., Melzack, R., Girard, N., Rondeau, J., & Paquin, M. (1990). Comparisons between patients' and nurses' assessment of pain and medication efficacy in severe burn injuries. Pain, 40, 143-152.
- Cohen, F. (1980). Postsurgical pain relief: Patient's status and nurses' medication choices. Pain, 9, 265-274.
- Donovan, L., Dillon, P., & McGuire, L. (1987). Incidence and characteristics of pain in a sample of medical-surgical inpatients. Pain, 30, 69-78.
- Evans, S. (1993). The economics of cardiac surgery. Clinical Issues in Critical Care Nursing, 4(2), 340-348.
- Ferguson, A. (1992). Pain following coronary artery bypass grafting: an exploration of contributing factors. Intensive and Critical Care Nursing, 8, 153-162.
- Fothergill-Bourbonnais, F., & Wilson-Barnett, J. (1992). A comparative study of intensive therapy unit and hospice nurses' knowledge on pain management. Journal of Advanced Nursing, 17, 362-372.

Jaros, J. (1991). The concept of pain. Critical Care Nursing Clinics of North America, 3(1), 1-10.

Jurf, J., & Nirschl, A. (1993). Acute postoperative pain management: A comprehensive review and update. Critical Care Nursing Quarterly, 16(1), 8-25.

Kim, S. (1980). Pain: Theory, research and nursing practice. Advances In Nursing Science, 2(2), 43-59.

Lander, J. (1990). Clinical judgments in pain management. Pain, 42, 15-22.

Marks, R., & Sachar, E. (1973). Under treatment of medical inpatients narcotic analgesics. Annals of Internal Medicine, 78(2), 172-181.

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

McCaffery, M., & Beebe, A. (1989). Pain clinical manual for nursing practice. Philadelphia: C.V. Mosby.

McGuire, D.B. (1985). The perception and experience of pain. Seminars In Oncology Nursing, 1(2), 83-86.

Meinhart, N., & McCaffery, M. (1983). Pain, a nursing approach to assessment and analysis. Norwalk: Appleton-Century-Crofts.

Melzack, R., & Wall, P. (1983). The challenge of pain. New York: Basic Books.

Owen, H., McMillan, V., & Rogowski, D. (1990). Postoperative pain therapy: a survey of patients' expectations and their experiences. Pain, 41(3), 303-307.

Orem, D. (1995). Nursing concepts of practice. (5th.). St. Louis: Mosby.

Polit, D., & Hungler, B. (1995). Nursing research principles and methods. Philadelphia: J.B. Lippincott

Puntillo, K. (1988). The phenomenon of pain and critical care nursing. Heart & Lung, 17(3), 262-273.

Riehl-Sisca, J. (1989). Conceptual models for nursing practice. (3rd.). Norwalk: Appleton & Lange.



Siegele, D. (1974). The gate control theory. American Journal of Nursing, 74(3), 498-503.

Spector, R. (1979). Cultural diversity in health and illness. New York: Appleton-Century-Crofts.