

REPORTED KNOWLEDGE AND MANAGEMENT OF ACUTE LOW BACK PAIN
BY UNITED STATES ARMY NURSE PRACTITIONERS AS COMPARED TO
CLINICAL PRACTICE GUIDELINES PUBLISHED BY THE AGENCY FOR
HEALTH CARE POLICY AND RESEARCH

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ABSTRACT

Acute low back pain (ALBP) is a major malady of a large percentage of patients seen in the primary care setting. Office visits for acute low back pain number second only to upper respiratory infections (Jones, 97). Proper management of this condition would be facilitated by a consensus among providers as to treatment modalities. This goal can be obtained through the use of published clinical expert guidelines. Guidelines such as those published by the Agency for Health Care Policy and Research (AHCPR), U.S. Department of Health and Human Services are in existence, however the adherence of primary care providers to these is in question. Many studies have focused on this question as it relates to general medical officers, but few are oriented to Nurses Practitioners (NP s) and none to military NP s. This pilot study attempted to assess the knowledge and experience of Army NP s through the use of Benner s novice to expert model. Data collection was conducted through the use of a mailed survey to Nurse Practitioners on active duty in the United States Army in an Army Medical Center (N= 10). The survey addressed issues in assessment, examination, diagnostic studies, treatment, learning opportunities, and experience with ALBP. A response rate of 66 % was obtained. Nurse Practitioners surveyed scored 59% or better in adherence with the AHCPR guidelines. The data suggests a general need for further training among NP s in ALBP to include appropriate treatment and diagnostic modalities.

Key words: Clinical practice guidelines, Nurse Practitioners, Acute low back pain, Agency for Health Care Policy and Research (AHCPR), Advanced Practice Nurses.

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PREFACE

This research was conducted to provide information on the knowledge regarding the care and treatment of acute low back pain in the reported adherence to clinical practice guidelines by United States Army Nurse Practitioners assigned to a major Army medical center. It was designed to encourage the use of clinical practice guidelines as a method to ensure continuity of care as well as cost effectiveness.

DEDICATION

This thesis is dedicated to my children, Katie and Jacob, who somehow managed to keep me sane and centered when I felt the most overwhelmed and lost. Without them I would have faded away long ago.

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CHAPTER 1: INTRODUCTION

Background

This chapter will review major areas of the research study: background of acute low back pain, adult learning theory, quality care, purpose of the study, research questions, conceptual framework, conceptual/operational definitions, assumptions, and limitations.

Acute low back pain is a major malady of a large percentage of patients seen in the primary care setting. It is estimated that over 80% of the United States population will suffer from at least one episode of acute low back pain sometime in their lives (Jones, 1997). International studies reflect similar findings with a rate between 65-80 % of the population experiencing at least some form of brief acute low back pain (Hart, Deyo, & Cherkin, 1995). In studies that examine symptoms, as opposed to provider office visits, it was found that at least 50 % of working age adults report discomfort significant enough to affect their productivity and diminish their ability to enjoy normal day to day activities (Acute Low Back Problems Guideline Panel, 1995).

Office visits for acute low back problems number second only to upper respiratory infections (Jones, 1997). In 1990, this accounted for almost 15 million visits to providers resulting in tremendous national cost relating to lost work, definitive care, pain, and lost function (Hart et al., 1995). In today's ever cost conscious environment, a more concrete example of the enormity of this problem was elucidated by Liu (1995) when data was presented estimating a loss of between 8 billion to 20 billion dollars yearly in medical costs and lost wages. A substantial portion of the medical costs relating to acute low back pain are generated from diagnostic testing such as computed

tomography (CT) and magnetic resonance imaging (MRI) (Cherkin, Deyo, Wheeler, & Ciol, 1994). If calculated with indirect costs associated with lost productivity and disability compensation, acute low back pain cost soar to as high as 100 billion dollars per year (Frymoyer, & Cats-Baril, 1991). Utilization of diagnostic tests was higher in patient cases referred to subspecialists as was the expense for the actual visit.

In the group of one hundred seventy managed care patients studied that received subspecialty care, six percent did not meet the criteria for referral or MRI usage as espoused by the Canadian Task Force on acute low back pain used in a study by Deyo, Loeser, and Bigos (1990). However, these same patients accounted for 27 % of the total group charges. Additionally, five of 14 patients did not meet published guidelines for the use of MRI and 10 of 17 did not meet referral criteria. Liu and Byrne concluded that a substantial portion of the cost for care was unnecessary when compared to published guidelines. This translates in to enormous saving of health care dollars by the primary care provider if these guidelines are utilized in the management of the patient presenting with complaints of low back pain.

Frymoyer and Cats-Baril (1991) refer to low back pain as an epidemic of the western world. According to Frymoyer and Cats-Baril the incidence of low back pain has not increased in recent history. What has changed is the societal perception of what acute low back pain is and the disability that results. In analyzing this change in opinion Frymoyer and Cats-Baril identify risk factors which relate back pain or its perception to a non-medical factors. These factors are predominately psychosocial and include job satisfaction, poor health habits, unappealing work environments, psychological problem, low evaluations from supervisors, compensatory injury, and a history of prior disability.

These same risk factors are associated with the failure of treatment of all types for low back pain. The authors propose that low back problems are a psychosocial phenomenon whose importance and socioeconomic impact have become prolific in the past 30 years.

As the military is a microcosm of the nation, acute low back pain has affected the United States Army. Acute low back problems account for thousands of lost duty days in the Army setting each year (O Conner & Marlowe, 1992). It is estimated that at least twenty percent of medical discharges from military service are the result of lower back problems (McFarling, 1989). In 1990 alone over nine percent of medical discharges for conditions occurring within the first 180 days of service were directly related to acute low back problems (O Connor & Marlowe, 1992). This translates into lost economic resources and, more importantly, readiness issues for the military.

Consistent care of acute low back problems is also critical in deployment missions during which military providers may be called upon to care for indigenous populations in other countries. Studies have shown that acute low back problems are an issue in these situations for populations in medically under served areas in which military medical resources may be utilized. For example, a study conducted during a medical readiness training exercise (MEDRETE) in Bolivia showed a large incidence of acute low back pain in the native population served by the medical service participating in the exercise (Blount, Krober, & Kozakowski, 1991).

Despite the high incidence, it is estimated that 80 % of the current 31 million people suffering from low back problems have no discernable cause (Bigos, Deyo, & Romanowski, 1995). Most of these people will recover in 2-7 weeks without medical intervention (Jones, 1997). Because recovery without intervention occurs there is little

consensus among providers as to which management modalities or diagnostic procedures are to be used effectively in the treatment of these patients. As a result of the lack of agreement in low back pain treatment, and the reality that most episodes of acute low back pain will resolve spontaneously with little or no medical intervention, it is essential that providers have a clear and consistent tool with which to identify serious disease processes and promote proven intervention techniques (Little et al., 1996). This points to the need for adherence to an accepted set of clinical guidelines for acute low back problems (Cherkin et al., 1994).

In the military setting adherence by providers to a specific set of guidelines may result in fewer duty days lost, less service related medical expense, and retaining more soldiers on active duty. In order to insure quality care, the clinical guidelines used should be published by a panel of experts such as the Agency for Health Care Policy and Research (AHCPR) of the U.S. Department of Health and Human Services (1994).

In the Army, utilization of nurse practitioners has increased in recent history. Since these providers will be the first and perhaps only resource seen by patients with complaints of low back problems it is critical that the Army nurse practitioners (ANP) deliver the highest quality of care possible as it relates to this issue. Knowledge of the AHCPR guidelines may contribute to obtaining this goal.

In 1994 the AHCPR published Clinical Practice Guidelines Number 14: Acute Low Back Problems in Adults. A panel of 23 experts was assembled based on their knowledge of orthopedic problems and specifically low back pain. This panel initiated a comprehensive search of the literature encompassing 3,918 articles (Bigos et al., 1994). The AHCPR's clinical practice guidelines describe the majority of known practice

modalities and their flexibility in clinical practice. It is specific in its statement of the elements of the problem and the patient population to which it applies. The guidelines are based on three critical pillars: initial assessment, clinical care methods, and special diagnostic procedures and considerations. A key component established by the expert panel is a rating scale to represent the potential of the recommended method of assessment and treatment to obtain the predicted goals. The panel also considered potential harm and costs (Bigos et al., 1994).

The initial assessment is composed of a focused medical history and physical exam to identify potential underlying spinal conditions referred to as Red Flags (Bigos et al., 1994). Non-spinal conditions that require referral are also addressed. In the absence of either of these two situations clinical interventions can be implemented. The goals of these interventions are to educate the patient, provide symptomatic relief and recommendations for appropriate activity level. The use of special diagnostic procedures is recommended if the symptoms persist for greater than one month after the initial assessment. Applying these guidelines in practice requires advanced knowledge of the acute low back pain and an experienced provider.

Adult Learning Theory

Experience, knowledge, and learning are components adult learning theory. Adult learning theory (David & Patel, 1995) is a recent perspective or view of how adults differ from children in the way they perceive the world and learn from it. To be an adult in the psychological sense of the definition is to be responsible for your own life and be self-directed. In the child learning model, the child is a dependent individual with the responsibility of what and how something should be learned placed upon the

teacher. The motivation for this behavior is primarily external on the child's part. These external factors range from pressure from parents, teachers, competition for grades and the consequence of failure. Adult learning theory acknowledges the presence of external motivators in the adult, but points to the more potent motivators as internal such as self esteem, better quality of life, greater self confidence, and recognition.

Knowles (1984) one of the progenitors of the adult learning theory coined the terms pedagogic, referring to the child learner and andragogic for the adult learner. In the andragogic mode learning begins through the understanding of what the adult brings with them through their experiences and accomplishments. In the adult, learning is facilitated by (a) their need to know, (b) the relevance of the learning on their own lives based on their experience, (c) and their self concept as self directed. Knowles promotes the adult learning experience as one of fluid bi-directional transactions in which learning flows back and forth between the student and teacher. The instructor is to fulfill the role of facilitator more than the traditional lecturer or expert who merely presents the information for rote memorization.

Advanced practice nurses are adult learners and therefore adult learning theory applies to the concepts of quality of care through the use of practice guidelines in that their utilization by the providers fulfills the above criterion. Knowing and using the clinical guidelines is relevant to their situation, makes them a better provider, and increases the self-image and confidence through their professional competence as they deliver quality care.

Quality of Care

The definition of quality care is an inherently subjective concept varying from context and perspective. According to Donabedian (1966) several attempts have been made in the literature to clarify this issue resulting in a evolutionary process leading to the current concept of quality care. He stated that the definition of quality was the balance between the actual benefit and the harm that accrue to the patient as a result of medical care. He later goes on to elaborate that quality was derived in the form of two elements. One based on the technical skill of the provider and the other on interpersonal skills. He stated the goodness of technical performance is judged in comparison with the best in practice. The best in practice has earned that distinction because it was known or believed to produce the greatest improvement in health. This means that the goodness of technical care was proportional to its expected ability to achieve these improvements in health status that the current science and technology of health care have made possible (Donabedian, 1988). Expanding on this notion the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) went on to add that patient care quality was the degree to which patient-care services increase the probability of desired patient outcomes and reduce the probability of undesired outcomes, given the current state of knowledge (JACHO, 1988).

In a continued attempt to refine the concept of quality of care, the Institute of Medicine proposed the following definition: Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (Lohr, 1990).

More recently, Buck (1992) took the approach that since an exact definition of quality of care has not been universally agreed upon any definition in current use should contain certain elements or standards:

Quality Health Care: Practice or activity in any given situation that is:

1. Thought by the responsible appropriate professional (A clinician if a clinical practice is involved) to be in consonance with those practices of the pertinent professional community (a standard defined by the appropriate professional community);
2. Associated with a high probability for good outcome (a standard supported by the professional literature);
3. Consistent with the policies, guidance, or requirements of authorized accrediting bodies (a standard in consonance with legal authority); and,
4. Perceived by the patient and his/her personal community to be caring, competent, and effective (a standard supportive of patient dignity, understanding, and desired outcome) (Buck, 1992, p. 261).

When examining all of the above concepts and definitions it is clear that an element of knowledge, experience, and expert clinical judgement is key in providing quality care.

Purpose of the Study

Published studies regarding the evaluation of nurse practitioners reported adherence and knowledge of published guidelines is minimal. The purpose of this pilot study was to determine the knowledge level of low back pain clinical practice guidelines and their use by United States Army nurse practitioners. A survey was conducted to assess ANP s knowledge, experience, and reported management of acute low back pain. The responses to the survey were evaluated against the Clinical Practice Guideline of Acute Low Back Problems in Adults No 14: Assessment and Treatment as published by the Agency for Health Care Policy and Research, a division of the U.S. Department of Health and Human Services (1994).

Research Questions

The following research questions were examined:

1. What is the experience level of ANPs in dealing with the specific problem of acute low back pain?
2. Do ANPs access learning opportunities to advance their knowledge of clinical practice guidelines?
3. Do ANPs know and report utilization of initial assessment techniques, clinical care modalities, and special diagnostic procedures of acute low back problems in accordance with the provisions of the clinical practice guidelines as published by the AHCPR?

Conceptual Framework

The tentative theory of this research was that knowledge, learning, and clinical practice overlap to produce quality care. The overlap or merging of these broad concepts is illustrated in Figure 1. The abstract concepts of knowledge, learning, and practice however have many contextual meanings and as a whole and are beyond the scope of this limited study.

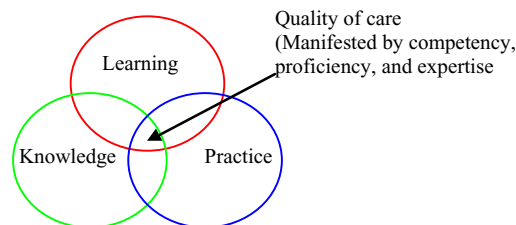


Figure 1.
Tentative Theory

Therefore it was necessary to attempt to examine a smaller portion of this broad theory. By deconstructing this tentative theory into smaller more easily managed components the scope of this research was narrowed. This was accomplished by postulating a set of hierarchical statement.

1. General statement: Quality care is achieved through the interaction of learning, knowledge, and practice.
2. Specific proposition: Adequate knowledge (awareness of the guidelines) in the NP (adult learning opportunities and experience) contributes to quality care as reflected in practice.
3. Hypothesis: If learning opportunities and experiences of NP s generate awareness of clinical practice guidelines then this should be reflected in practice as described through reported behavior.

In order to further refine and examine elements of these relationships a conceptual framework was required. Benner s Nursing Theory (1982) of novice to expert was adapted to provide this framework. The Dreyfus Model of skill acquisition was Benner s original framework which she generalized to describe the progression of the beginning nurse to one who is expert in their field. This model states that as an individual goes through the acquisition and development of a skill they pass through five levels of proficiency. These levels are novice, advanced beginner, competent, proficient, and expert. The transition through these levels reflects two aspects of developing expert skills. The first of these is one of the movement from reliance on abstract principles taught in traditional learning environments to one of usage of concrete past experiences as templates for practice. The second is a shift in perception where the situation is

viewed as a whole with certain parts having more meaning than others as opposed to the individual bits and pieces making up that situation.

Through analysis of interviews of both new nurses and experienced nurses acting as their preceptors Benner (1984) has developed seven domains based on roles, functions, and competencies. Competency is used to describe an area of skilled performance identified and categorized by its meaning, intent, and function. Domain refers to a cluster or group of competencies that have similar meaning, intent and function. In this research, the focus was on only two of the seven domains due to their being most closely aligned with the elements of the clinical practice guidelines of assessment, management, and diagnostic testing. The two domains were diagnostic/patient monitoring function and administering/monitoring therapeutic interventions and regimens.

According to the original Dreyfus model, an individual progresses from novice to expert undergoing a cognitive metamorphosis in which their traditional knowledge and experience merge or blend until their whole is greater than the sum of their parts. This intuitive method of viewing and interacting with their environment is initiated during the competent phase of the nurses growth and is complete as they become expert. They no longer rely solely on rules or maxims of practice as did the novice. This vast amount of experience and knowledge allow the expert to focus on relevant regions of the problem and not waste resources on extraneous information. The use of clinical practice guidelines may seem at odds with Benner's description of an expert as they appear more like the novice's use of written context free abstracts that they can relate to a specific patient with a specific set of criterion. However, the use of guidelines requires not only knowledge of them, but also experience to identify when it is appropriate to utilize them.

In this context, experience has a specific definition. It is defined as not simply the passage of time; it is the refinement of preconceived ideas and theories through encountering different situations that subtly shape and modify them. Benner herself stated that experts may require the use of analytical tools particularly in new or novel situations. Experience is further refined to require openness to new situations. This openness is tempered by what has gone on before and is not naive or undifferentiated (Benner, Tanner, & Chesla, 1992). In this regard, clinical practice guidelines become an analytical tool requiring expert insight for their proper use.

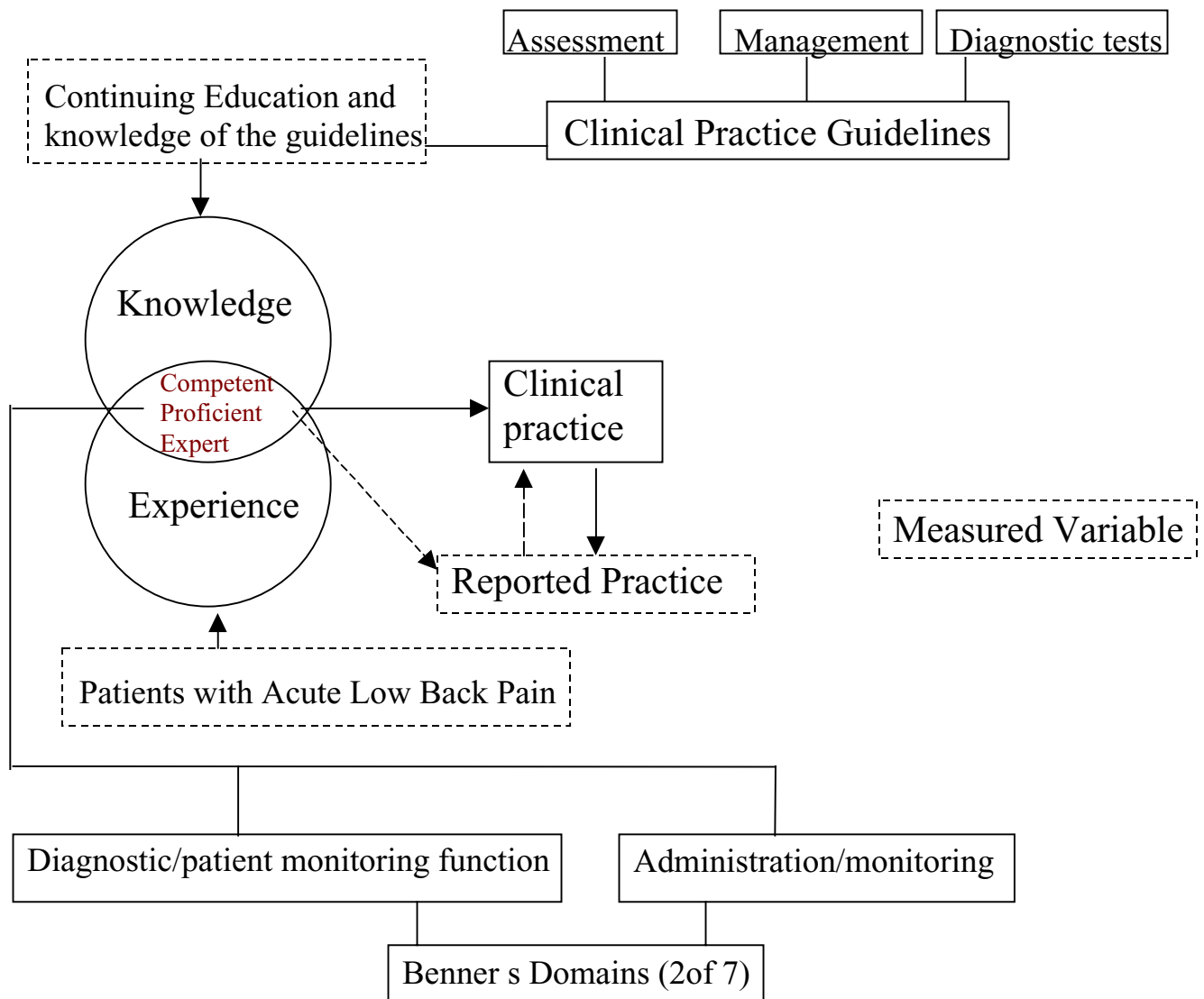


Figure 2.
Conceptual Framework

In adapting Benner's Model this study examined the relationship between knowledge, experience, and practice. Knowledge was assessed in the form of awareness of clinical practice guidelines for acute low back pain. Level of experience was addressed by ascertaining patient contacts with complaints of acute low back pain and continuing education opportunities. Reported clinical practice in this study was assumed to reflect actual behavior in the deliverance of patient care. By dividing each of the above mentioned components in the NP it was possible to delineate relationships between them as they apply to the final hypothesis of the hierarchical statements.

Definition of terms

Acute Low Back Problems: Activity intolerance lasting less than three months in duration, resulting from low back problems and/or back related leg symptoms of a patient at least 18 years of age (Bigos et al., 1994).

Clinical Practice Guidelines: Systematically developed statements to assist practitioner and patient decisions regarding appropriate health care. They are derived from explicit, science-based techniques and expert clinical judgement (Bigos et al., 1994, p. ii).

Quality Care: The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge (Buck, 1992, p. 260).

Red Flags: Serious underlying spinal conditions such as fracture, tumor, infection, or cauda equina syndrome (Bigos et al., 1994, p. 2).

Non-spinal Conditions: Diagnosis of vascular, abdominal, urinary, or pelvic pathology (Bigos et al. 1994, p. 1).

Conceptual/Operational Definitions

Variable-Knowledge

Conceptual definition: awareness of facts, truths, and principles as they relate to assessment, care modalities, and diagnostic tests in the reported management of acute low back pain (Morehead, 1992).

Operational definition: Questions 1 through 8 in the instrument as measured through an investigator developed survey (see appendix B).

Variable- Experience

Conceptual definition: The process of learning by personally observing and encountering an event and the knowledge or skill obtained by this process (Morehead, 1992).

Operational definition: Measurement of the NP s professional experiences to include episodes in which the provider has encountered acute low back pain in their practice as well as opportunities to enhance their knowledge base through learning activities which are deemed self-direct, self-motivated, and competency enhancing. Questions 9 through 12, 14, 15 and 16 of the tool as measured through an investigator developed survey (see appendix B).

Variable- Practice

Conceptual definition: Actions carried out in the performance of a profession.

Operational definition: the reported management of patients with acute low back pain in accordance with the AHCPR clinical guidelines and there use by the provider.

Responses to Questions 1 through 8 of the tool were compared to the guidelines and Question 13 and 17 address the issue of their reported use in practice (see appendix B).

Variable- U.S. Army Nurse Practitioner

Conceptual definition: A nationally certified nurse practitioner who has successfully completed an accredited nurse practitioner program and is serving in the United States Army in one of the following specialties: family, adult, and acute care (Johnson, 1999).

Operational definition: Question 11 of the investigator developed survey (see appendix B).

Assumptions and Limitations

The limitations and assumptions to this study focused primarily on the issues of the characteristics of nurse practitioners education and the military environment in which they function.

Assumptions

1. U.S. ANPs who answered survey questions did so without duress and honestly.
2. Reported practice was an accurate reflection of the provider s actual patient care practice.
3. Primary care providers have encountered patients with acute low back pain in their practice.

Limitations

This research was limited to U.S. ANP s at one major Army Medical Center and therefore findings may not be generalized to all nurse practitioners who provide care to

patients with acute low back pain. The role of US ANPs may be different than that of nurse practitioner in a civilian setting.

CHAPTER TWO: REVIEW OF RELEVANT LITERATURE

Purpose of the Study

The purpose of this study was to evaluate the knowledge and reported practice of US Army Nurse Practitioners in the management of acute low back pain. The guidelines utilized for this purpose were the Clinical Practice Guideline of Acute Low Back Problems in Adults: Assessment and Treatment, Number 14, as published by the Agency for Health Care Policy and Research, a division of the U.S. Department of Health and Human Services (Bigos, Bowyer, Brown et al, 1994). At the present time published studies regarding the evaluation of nurse practitioners knowledge of clinical guidelines are absent. Research specifically targeted at assessing the military nurse practitioner in this area is limited despite the fact that studies point to the United States military as an occupation with risk for acute low back pain. The review of literature addressed the utilization of practice guidelines and their relevance in other patient care settings.

Acute Lower Back Problems

Jones (1997) refers to acute low back pain as a major malady of a large percentage of patients seen in the primary care setting. It is estimates that over 80% of the United States population will suffer from at least one episode of acute low back pain sometime in their lives. Acute low back pain is recognized as the third most frequent presenting complaint in private practice. Most individuals with acute low back pain will recover in 2-7 weeks without medical intervention. This complicates the management of acute low back pain and perhaps explains why there is little consensus among providers as to which management modalities or diagnostic procedures are to be used effectively in the treatment of these patients. Other issues such as the psychosocial implications of

acute low back pain and patient education are also examined and presented for consideration by the reader. Current treatment modalities and drug therapies are discussed in relation to *Red flags* or warning markers to the clinician as to the presence of more serious illness that will warrant referral.

International data in a 1995 study by Hart, Deyo, and Cherkin reflects similar findings with a rate between 65-80 % of the population experiencing at least some form of brief acute low back pain. In 1990 this accounted for almost 15 million visits to providers in the United States alone, manifesting in tremendous cost related to lost work, definitive care, pain, and lost function. These statistics are derived from a national five-year survey study focusing on frequency of office visits, variations in ambulatory care, and differences among physicians by specialty. The study discussion section suggests that future research in this area be a priority due to the current shifts from inpatient care to the outpatient ambulatory care setting. Continued research is required in order to obtain the most appropriate diagnostic test and therapy for this common malady.

In studies that examine symptoms it was discovered that at least 50 % of working age adults report discomfort significant enough to affect their productivity and diminish their ability to enjoy normal day to day activities. In persons under 45 years old, low back problems are the most common cause of disability. In a published article by the expert panel commissioned to create a set of clinical practice guidelines for the Agency for Health Care Policy and Research (1994) new emphasis is placed on the concept of shifting care away from pain exclusively to assisting the patient to tolerate activity. The intent of the article is to introduce the guidelines and demonstrate how they can be utilized in accomplishing this task (Acute Low Back Problems Guideline Panel, 1995).

It is estimated that 80 % of the current 31 million people suffering from low back problems have no discernable cause (Bigos, Deyo, & Romanowski, 1995). Further confounding the issue is the fact that most episodes of acute low back pain will resolve spontaneously with little or no medical intervention. Considering these two factors, it is essential that providers have a clear and consistent tool with which to identify serious disease processes from non-serious illness and provide proven intervention techniques in either situation. Clinical practice guidelines provide this tool (Little et al., 1996).

Guidelines

The prevalence of acute lower back pain and the discrepancies among provider in its treatment points to the need for adherence to an accepted set of clinical guidelines for acute low back problems. In 1994, Cherkin, Deyo, Wheeler, and Ciol conducted a study that examined the patterns of diagnostic procedure usage in low back pain among a stratified random sample of physicians. The study utilized a questionnaire which addressed the issues of which diagnostic test the physicians recommended for patients with back pain, types of tests ordered by different physician specialty, and the degree of appropriateness for their choices based on medical knowledge and expert recommendation. Responses were compared to the set of guidelines recommended by the Quebec Task Force on Spinal Disorders (Spitzer, LeBlanc, & Dupuis, 1987).

The results demonstrated little consensus within or among the various specialties surveyed regarding appropriate diagnostic testing. The individual physician's preference and specialty guided their choice as well as the patient's symptoms and physical exam. The authors suggested the need for additional clinical guidelines as well as closer reported adherence to existing guidelines in order to assure the highest quality care. The

above study was expanded in 1995 to encompass approximately twice the number of physicians. The results, however, did not differ significantly from the earlier work leading the authors to suggest that perhaps the inconsistencies among providers could be traced in part to the absence of clear scientific evidence based clinical guidelines (Cherkin et al., 1995).

Little and colleagues (1996) launched a study in Great Britain in which they examined general practitioners reported management of acute back pain in comparison to evidence based clinical guidelines. The researchers utilized a confidential postal questionnaire in order to ascertain the physician's selection of examinations routinely performed, awareness of danger signs and symptoms warranting urgent referral, patient education, and satisfaction with outcomes. The Quebec Task Force Guidelines were also employed in the study (Spitzer, LeBlanc, & Dupuis, 1987). Little et al. concluded that there was little adherence to the guidelines by general practitioners and that they needed to be more aware of the danger signals or red flags that could herald a poor patient outcome. It was also noted that much of the patient education or advice given by these providers had little basis on scientific evidence.

Acute Low Back Pain in the Military Population

The societal issues of acute low back problems are reflected in the United States Army. Acute low back problems account for thousands of lost duty days in the army setting each year. In 1990 alone over 9 % of medical discharges for conditions occurring within the first 180 days of service were directly related to acute low back problems. A pilot observational study conducted to evaluate the incidence of lower back problems in basic military trainees and their comparability to previous research found an incidence of

17% in the population examined. Of the 160 subject initially surveyed, 7 responded positively on the entry question regarding a history of low pack pain. Of the 147 subjects completing the exit survey, 27 responded positively to the question dealing with new onset low back pain demonstrating an increase of 13% (O Connor & Marlowe, 1992). It is estimated that at least 20% of medical discharges from military service are the result of lower back problems (McFarling, 1989). Large patient populations such as this translate into lost economic resources and readiness issues for the military.

Consistent care of acute low back problems is also critical in deployment missions during which military providers may be called upon to care for indigenous populations in other countries. Blount, Krober, & Kozakowski (1991) conducted a review survey in which records from 2169 patients seen during a medical readiness training exercise (MEDRETE) in Bolivia were screened and coded by primary complaint. The MEDRETE data was compared to U.S. ambulatory care data in order to highlight similarities and differences in the two populations. The percentages of patients presenting with musculoskeletal system complaints were remarkably similar, 10.8 % MEDRETE and 10.1 % U.S. However, when considering the ranking of presenting disorders, lower back pain rated seventh in the MEDRETE population compared to twenty-seventh in the U.S. data.

Adult Learning Theory

The recent literature dealing with adult learning theory in the medical profession primarily deals with its use in medical school curriculum. One exception to this is Beeman s (1988) study in which the author attempted to identify RNs satisfaction with baccalaureate programs when returning to school to obtain their degree. The study was

one in which a survey was utilized to poll the students in 12 different baccalaureate programs from Pennsylvania, Massachusetts, Oregon, California and Virginia. The curriculums included those with the traditional four-year program as well as lock-step progression that gave credit for professional experiences. The results found greater satisfaction among the adult learners, those RNs returning to school, in the program which utilized an adult learning theory process. Many of these same adult learners found the traditional baccalaureate programs to be time wasting and frustrating.

The concept of empowerment has also been addressed in light of the adult learning theory. Roberts and Chandler (1996) espouse changes in the way current graduate nursing programs educate their students. Through the use of adult learning theory they feel that the graduate student will gain a sense of empowerment in which they become self-directed and self-motivated learners. They theorize that provider trained in this manner will bring more desirable attributes to the health care. These qualities would include greater proficiency and competence, higher motivation and professional work ethics, as well as the ability to lead and be a team member.

The success of adult learning theory in use in the medical education setting has been addressed in the literature in regards to its bases for problem based learning. Barrows (1983) speaks of this theory in disguising this type of self-directed learning as a way to insure the material is seen as relevant by the students and provides appropriate motivation for learning. In a descriptive study by Green and Ellis (1997) Adult learning theory is cited as the foundation for their proposed evidence-based medicine curriculum. The authors selected adult learning theory for this purpose based on its ability to encompass self-initiation, self-direction, internal motivators, realistic learning solution,

the opportunity for feedback, and problem centered organization. All of these elements point back to the adult as a self- motivated learner of relevant information to their situation.

The medical school at Newcastle, New South Wales, Australia bases its curriculum on this premise of adult learning. The proponents of this program state they are teaching the students how to learn and giving them skills which will make them life—long learners and hence superior medical care providers during their careers (Neame & Powis, 1981). More recently David and Patel (1995) continue to develop this model and its use in problem based learning in the instruction of pediatric medical school curriculum. Unlike previous authors Patel also addresses some of the weaknesses inherent with this theory as it is used in this formal setting. These problems revolve around the ease with which it can be undermined and devalued. He states that it is critical that the adult learner be given autonomy in this process and not be given specific learning objectives or a specific recipe to follow during the learning experience. The second major pitfall to the implementation of the theory is behaviors and prejudices of the instructors or tutors who must remain patient and continue to encourage the process itself without merely providing the right answer . The process of searching for this answer is in itself where the true learning occurs.

Published studies regarding the evaluation of adherence of nurse practitioners to published guidelines of any sort are lacking. Published research in this area addresses only physician compliance to guidelines and not the role of the nurse practitioner in the management of low back pain. Research specifically aimed at assessing the military nurse practitioner in this area is non-existent.

Summary

A review of the literature demonstrated little consensus among health care providers regarding appropriate care in the treatment of low back problems. Knowledge and reported utilization of published guidelines also appears to be minimal. However, it is demonstrated that compliance with validated guidelines could be utilized as a cost containment method in the treatment of this growing problem. Risk factors associated with low back pain vary by occupational areas. The literature pointed to the United States military as one of these areas containing occupational risks for acute low back pain. Adherence by providers in the military primary care setting to a specific set of guidelines may result in fewer duty days lost, less service related medical expense, and retaining more soldiers on active duty. These guidelines must be based on scientific evidence and published by a panel of experts such as the Agency for Health Care Policy and Research (AHCPR) of the U.S. Department of Health and Human Services (1994).

Utilization of nurse practitioners in the United States Army primary care setting has increased rapidly in recent history. These providers will be the first and perhaps only medical resource seen by patients with complaints of low back problems. Assessment of their knowledge and reported management of acute low back pain was necessary to insure that the Army nurse practitioners (ANP) deliver the highest quality of care possible as it relates to this issue. The data collected to this end can be utilized to adapt continuing education opportunities and quality improvement programs geared to increase the knowledge and reported utilization of the AHCPR guidelines in the ANP's practice.

CHAPTER THREE: METHODOLOGY

Introduction

The purpose of this pilot study was to evaluate the knowledge and reported practice in the management of acute low back pain by US Army Nurse Practitioners in a major Army Medical Center. This chapter describes the research design and methodology utilized in this study. Instrument development procedures to obtain estimates of reliability, validity and procedures for sample selection are discussed. Proposed data analysis, institutional approval process, and the protection of human rights will also be addressed.

Research Design and Procedures

This was a descriptive study in that it attempted to provide an accurate portrayal or account of characteristics of a particular individual, situation, or group (Selltiz, Wrightsman, & Cook, 1976). The research goal was to identify and describe the knowledge care and reported management of acute low back pain as it relates to published guidelines. The guidelines chosen for this purpose were the Clinical Practice Guideline of Acute Low Back Problems in Adults: Assessment and Treatment, Number 14, as published by the Agency for Health Care Policy and Research, a division of the U.S. Department of Health and Human Services published in 1994 (Appendix A).

Sample

Due to accessibility constraints the sample was drawn from one major medical center in the United States Army Health Command. Acute low back pain is usually specific to a certain patient population and therefore it may be more relevant to poll only those Nurse Practitioners who would likely have need to utilize guidelines dealing with

this malady on a consistent basis. Family Practice, Acute Care, and Adult Practice providers closely fit this description. The subset of pediatric Nurse Practitioners was excluded from the survey due to the fact that the AHCPR guidelines are specifically directed to patients over the age of 18. While women's health practitioners most certainly address issues of low back pain in their practice, they have very specific medical issues that are not addressed at length in the AHCPR guidelines, such as childbirth and gynecological disorders. Due to these practice differences they were also be excluded in order to simplify the focus of this initial examination of the subject.

Measurement

The tool utilized for this study was one adapted from earlier research which examined the adherence of general practice physicians to a set of evidence based guidelines (Little et al., 1996). The tool was modified to include issues appropriate to the scope of care for a Nurse Practitioner in the military environment (Appendix B). It was a questionnaire developed to assess four question areas related to how providers address acute low back pain:

1. Does the provider access learning opportunities in the areas of clinical practice guidelines? Are these opportunities specific to acute lower back pain? Are they in a more formal traditional setting or do they ascribe to the tenants of adult learning theory?
2. What are the elements of the initial exam given by the provider? This question includes items addressing general assessment, regional back exam, red flags, and neurologic screening?

3. What clinical care modalities does the provider utilize? This includes items addressing patient education, patient comfort, and activity alterations.
4. What special diagnostic procedures are selected by the providers and are their selections in accordance with the guidelines?

Content Validity

In order to obtain estimates of content validity the tool was evaluated by an expert panel of nurse practitioners with orthopedic backgrounds. This panel evaluated the degree of relevance of each question to the study using a four-point scale. Items identified as valid by all of the experts were included in the instrument. In addition the experts were asked to identify any topics or areas relevant to the subject matter which was not mentioned in the survey tool. After evaluation revisions were not necessary. No changes to the tool were made once validity was obtained through this method.

Data Analysis

The use of descriptive statistics enabled the organization of the collected data in a meaningful phenomenon allowing the determination of relevance to the proposed research questions. This was accomplished through the use of summary statistics (Burns & Grove, 1997). These included frequency distributions and percentages. In order to facilitate the interpretation of the data, SPSS will be utilized. Initially, frequency distributions will be determined in order to detect errors in coding and computer programming. Demographic information was collected to more accurately describe the experience of the sample population. Information regarding the subject s certified

licensure and current practicing arena will be categorized as well as educational level and years providing care as a Nurse Practitioner. The data will be coded and classified into sets to determine how the survey population responded to each of the three major components of the survey addressing knowledge, experience, and reported practice.

Protection of Human Rights

Prior to initiating data collection, approval for this study was obtained through the approval process of the Institutional Review Board (IRB) of the Uniformed Services University of the Health Sciences, Bethesda, MD, and the IRB of the surveyed Army medical center. The Department of Nursing Research at that medical center was instrumental in accomplishing this research.

The study was accomplished through the use of an anonymous survey with voluntary participation. Completion and return of the survey represented the respondents consent to participate in the research. Only Nurse Practitioners were polled. Measures to insure anonymity of the respondents included:

1. Absence of any identifiers on either the survey or the cover letter.
2. Unmarked return envelopes were included with the survey.
3. Names of participants were not maintained.
4. No follow-up was attempted on an individual bases.

Summary

This chapter discussed the methodology to be used in describing the self reported professional practice of Nurse Practitioners in the United States Army as it relates to acute low back problems and their compliance with published guidelines. Estimates of

reliability and validity of the survey instrument were obtained through the use of an expert panel in the area of acute low back problems. Surveying the entire population subset of Army Nurse practitioners at the medical center will eliminate the possibility of sample error. Surveys were returned in pre-addressed stamped envelopes with no indication as to the respondent's identity. Chapter four will discuss the results of the data collection and analysis.

CHAPTER FOUR: DATA ANALYSIS

Introduction

The purpose of this pilot study was to determine the knowledge level of low back pain clinical practice guidelines and their use by United States Army nurse practitioners (ANP) at a large Army Medical Center (MEDCEN). The methodology consisted of a survey conducted utilizing a questionnaire given to active duty Army Nurse Practitioners at that MEDCEN. The focus of the survey assessed ANPs knowledge, experience, and reported management of acute low back pain. The appropriateness of the responses to the questions in the survey were evaluated in comparison to the Clinical Practice Guideline of Acute Low Back Problems in Adults No 14: Assessment and Treatment. These guidelines are published by the Agency for Health Care Policy and Research, a division of the U.S. Department of Health and Human Services (1994).

Sample characteristics

Surveys were distributed through the Department of Nursing of the MEDCEN to a total of 15 ANPs including Acute Care, Adult, and Family Nurse Practitioners. A total of 10 responses were received within the allotted time period for a 66% response rate. Anonymity was preserved and no follow-up was attempted.

The Data

Demographic data was collected to describe the respondents and their background. Questions 9-17 (appendix B) of the survey addressed the sample demographic data. Research Question One addresses the experience level of the nurse practitioners in the sample who treat acute low back pain. Six of the respondents were Family Nurse Practitioners (FNPs), three were Adult Nurse Practitioners (ANPs), and

one was an Acute Care Nurse Practitioner (AcNP) for a sample size of ten. As a group the sample had a range of 27 years as nurses and 11.5 years as a nurse practitioners. The minimum and maximum for years as a nurse were 2 years and 29 years respectively with a mean of 15 years. Years as a nurse practitioner demonstrated a minimum and maximum of 0.5 years and 12 years with a mean of 3 years.

Research Question Two asked if nurse practitioners access learning opportunities in order to advance their knowledge of clinical practice guidelines. Questions 12, 16, and 17 were directed at this issue. With regard to educational opportunities, three of the Nurse Practitioners indicated that they had attended some type of training dealing with acute low back pain since 1994. All but one of the respondents responded affirmatively to subscribing to professional journals. As a group the nurse practitioner responded with a mean of 3.3 hours per week reading professional material. In combining all three of the questions regarding educational opportunities the data showed that the respondents as a group took advantage of 70% of the items addressed. The respondent with the minimal response was 33% and the maximum being 100%. From this it can be concluded that all respondents did seek educational opportunities at varying levels.

Practice settings varied among the respondents to include family practice, women s health, ambulatory care, and other (internal medicine, etc.). Seven of the ten respondents indicated that they used clinical practice guidelines in their practice.

The following portion of the data addresses Research Question Three. It is presented in the same format as utilized in the tool (see appendix B). The tool was divided into three sections to assess knowledge of assessment, management, and the use

of diagnostic testing. A cumulative summary was provided at the end of each of the three sections.

Questions 1, 2, and 3 of the survey addressed the assessment of a patient with acute low back pain. Each question was divided into a series of positive or negative responses depending on the knowledge of the respondent.

In Question One the respondents were asked to identify, from a list of eight components, the routine elements of a history taken during the initial assessment of a patient presenting with acute lower back pain. Two of the six components were distracters.

Table 1

Percent of initial history topics correctly identified by respondents as appropriate during routine evaluation of patients with acute low back pain

History Component	Correct responses (n =10)	% correct
History of Cancer	2	20
Unexplained weight loss	3	30
Pain worse at rest	9	90
Prolonged use of corticosteroids	3	30
History of trauma	10	100
Urinary retention or incontinence	8	80
*History of diabetes	10	100
*Family history of back problems	8	80

n=10, *Distracter

Of the six questions identified by AHCPR for routine evaluation during the initial history, respondents correctly identified only one, history of trauma, as essential 100% of the time. Three of the six questions were correctly identified as essential history elements 80 % or greater of the time. The remaining three questions, history of cancer, prolonged use of corticosteroids, and unexplained weight lose were not selected by the respondents as essential history elements. The two distracter questions, family history of back problems and history of diabetes, were identified as unessential by 80% or greater of the time by the respondents.

In Question Two respondents were asked to identify, from a list of seven components, the routine tests or examination techniques utilized in an initial assessment of a patient presenting with acute low back pain. Two of the seven were distracters.

Table 2
Initial examination techniques identified as appropriate by respondents during routine evaluation of a patient with acute low back pain

Initial Examination Component	Correct responses (n =10)	% correct
Dorsiflexion strength of ankle	5	50
Strength of great toe	2	20
Ankle reflexes	6	60
Touch sensation of lower extremities	7	70
Straight leg raises	9	90
*Romberg test	9	90
*Bulge sign	9	90

n=10, *Distracter

Of the five elements identified by the AHCPR for routine utilization during the initial examination, respondents only correctly identified two, touch sensation of lower extremities and straight leg raise, as essential 70% or greater of the time. The remaining three examination procedures, dorsiflexion of the ankle, strength of the great toe, and ankle reflexes were not selected by the respondents as essential examination elements. The distracter questions, Romberg test and bulge sign, were identified as nonessential 90% of the time.

In Question Three respondents were asked to identify, from a list of five components, the symptoms justifying the immediate referral of the patient presenting with acute low back pain. Two of the five symptoms were distracters.

Table 3

Percent of respondents identifying the signs and symptoms for immediate referral of the patient with acute low back pain

Red Flag Component	Correct responses (n =10)	% correct
Constant night pain	2	20
Saddle anesthesia	9	90
Neurological signs at multiple levels	10	100
*Severe local back pain	7	70
*Pain less than 72 hours duration	10	100

n=10, *Distracter

Of the three symptoms identified by the AHCPR as red flags for referral, respondents identified only one, neurological signs at multiple levels, as essential 100%

of the time. Saddle anesthesia was correctly identified as a red flag for referral 90% of the time. Constant night pain is a red flag for referral according the AHCPR guidelines and was not selected by the respondents as essential. The distracters, severe local pain and pain less than 72 hours, were identified 70% or greater of time as such by the respondents.

The cumulative scores for the initial assessment of acute low back pain were calculated combining questions 1, 2, and 3 to yield a mean percent of the elements correctly identified by the respondents in correlation with AHCPR guidelines. A mean of 69.7% correct was scored by the respondents with a minimum of 52.6% and a maximum of 100%.

Questions 4, 5, 6, and 7 of the tool (appendix B) address the management and therapy for a patient with acute low back pain.

In Question Four, respondents were asked to identify, from a list of ten components, the modalities routinely use to treat patients presenting with acute low back pain. Six of the ten components were distracters. Of the four modalities identified by the AHCPR for routine treatment of acute low back pain, respondents correctly identified two, ice application and epidural injection, as appropriate 100% of the time. Heat application was correctly identified 80% of the time. Spinal manipulation, identified by the AHCPR as an appropriate modality, was not selected by any of the respondents. The distracters were identified by the respondents as not appropriate treatment 80% or greater of the time.

Table 4

Percent physical treatments identified as appropriate by respondents for the patient with an initial complaint of acute low back pain

Treatments	Correct responses (n =10)	% correct
Ice application	10	100
Heat application	8	80
Epidural injections	10	100
Spinal manipulations	0	0
*Ligament or joint injections	10	100
*Traction	10	100
*Back belts	8	80
*Shoe insoles or lifts	9	90
*Lumber corsets	9	90
*TENS usage	9	90

n=10, *Distracter

In Question Five respondents were asked to identify, from a list of six components, the medication that would be routinely prescribed for a patient presenting with acute low back pain. Three of the six components were distracters. Of the three medication identified by the AHCPR for routine treatment of acute low back pain, respondents correctly identified only one, NSAIDS, as appropriate 100% of the time. The remaining two medications, acetaminophen and muscle relaxants, were not selected by the respondents as appropriate. The question did not specify if they would be selected as first line or second line recommendations. The distracters were correctly identified

100% of the time by the respondents as inappropriate for the treatment of acute low back pain.

Table 5

Medications identified as routinely prescribed for patients with an initial complaint of acute low back pain

Medication Component	Correct responses (n =10)	% correct
NSAIDS	10	100
Acetaminophen	5	50
Muscle Relaxants	6	60
*Opioid use	10	100
*Oral Steroids	10	100
*Antidepressants	10	100

n=10, *Distracter

In Question Six, respondents were asked to identify, from a list of eleven components, the activities routinely recommended for patients presenting with acute low back pain. Four of the eleven components were distracters. Of the seven activities identified by the AHCPR as appropriate for routine recommendation, respondents correctly identified only one, bed rest less than 4 days, 60% of the time. The remaining six activity recommendations were not selected by the respondents as appropriate. Three of the four distracters were identified as inappropriate 100% of the time by the respondents. Generally low scores in this area point to a lack of knowledge regarding appropriate activities for patients with ALBP. The question regarding aerobics did not specify low impact, which may explain why it was not selected by any of the respondents.

Table 6
Activities identified as appropriate to advise patients with acute low back pain to participate in

Activity Recommendations	Correct responses (n =10)	% correct
Biking	1	10
Walking	4	40
Swimming	3	30
Step Aerobics	0	0
No Exercising	4	40
Bed Rest Less Than 4 Days	6	60
Back extensor Exercise After 2 Weeks	4	40
*Running	10	100
*Bed Rest Greater Than 4 Days	10	100
*Back Muscle Stretches	4	40
*Back Specific Machines	10	100

n=10, *Distracter

In Question Seven respondents were asked to identify, from a list of five components, the types of education required to be routinely provided for the patient presenting with acute low back pain. One of the five items, fitting for a lumbar brace, was a distracter. Of the four elements identified by the AHCPR for routine education of the patient with acute low back pain, respondents correctly identified only one, activity recommendation, 100% of the time.

Table 7

Patient education identified as appropriate to provide to patient with initial acute low back pain

Patient Education Component	Correct responses (n =10)	% correct
Body Mechanics	8	80
Medication Instructions	9	90
Activity Recommendation	10	100
Exercise Therapy and Stretching	5	50
*Fitting for a Lumbar Brace	9	90

n=10, *Distracter

The remaining three of the four items were correctly identified as appropriate 80% or greater of the time. The AHCPR guidelines recommend exercise therapy and stretching appropriate for the individual patient.

Cumulative mean percent scores were calculated combining questions four through seven in the management of acute low back Pain. The respondents as a group scored a mean of 75.2% correct with a minimum score of 64.4% and a maximum score of 86.1%.

In Question Eight the respondents were asked to identify, from a list of five components, the situations in which diagnostic test would be routinely performed for the patient presenting with acute low back pain. Two of the five items were distracters. Of the three situations identified by the AHCPR as appropriate for diagnostic test of the patient with acute low back pain, respondents correctly identified only one, return visit if parasthesia, 100% of the time. The remaining two situations, complaints greater than one

month and symptoms return after four weeks, were not selected by the respondents as appropriate for diagnostic testing.

Table 8

Situations identified by respondents that would result in obtaining a MRI, CT scan, EMG or laboratory tests

Diagnostic Test Components	Correct responses (n =10)	% correct
Return Visit if Parasthesia	10	100
Return if Complaints greater than 1 month	6	60
Return visit if symptoms return after 4 weeks	3	30
*Patient tolerates sitting at work for 50 minutes	10	100
*Return visit in 1 week with same complaints	7	70

n=10, *Distracter

The distracters were identified by the respondent as inappropriate 70% or greater of the time. The mean correct score for the respondents in this category was 72% with a minimum score of 40% and maximum score of 100%.

Summary

The total mean percent score was calculated incorporating all three categories: assessment, management, and diagnostic tests in the care of the patient presenting with acute low back pain. The nurse practitioners that participated in this study scored an average of 72.3% on the combined items. Figure three represents all three tested areas and the total scores of the respondents.

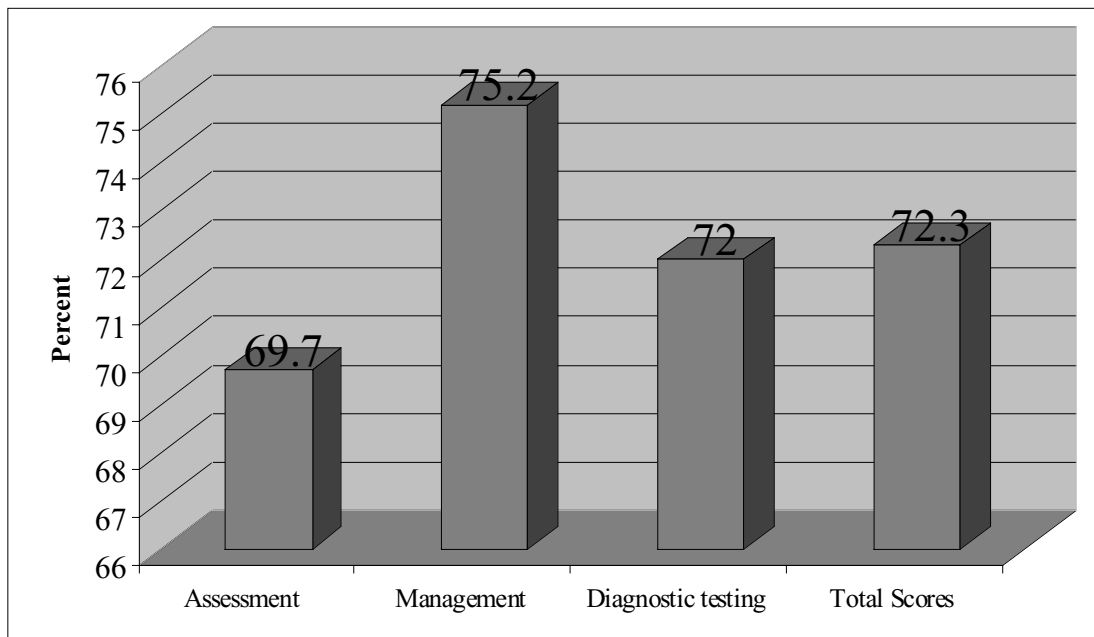


Figure 3. Comparison of responses in each area of care for acute low back pain

The purpose of this chapter was to present the data and its analysis. Characteristic of the respondents have been described in order present a clear image of their background and knowledge. Chapter five will present summarization, discussion of the findings, and relevant recommendations.

CHAPTER FIVE: FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Acute low back pain is a major malady of a large percentage of patients seen in the primary care setting. For this reason it is particularly important that clinical guidelines are utilized to promote proven interventions as well as differentiate between those patients requiring minimal care and those patients with serious disease warranting referral. Acute low back problems account for thousands of lost duty days each year as many soldiers cannot perform their jobs in the military setting. This translates into diminished economic resources and lost readiness for the U.S. Army. Consistent care of acute low back problems is also critical in deployment missions during which military providers may be called upon to give humanitarian assistance to refugee or indigenous populations in other parts of the world.

The purpose of this pilot study was to determine the knowledge level of low back pain clinical practice guidelines and their use by United States Army nurse practitioners (ANP) at a large Army Medical Center (MEDCEN). Currently published studies regarding the evaluation of nurse practitioner reported adherence and knowledge of published guidelines are minimal. The methodology for this study consisted of a survey utilizing a questionnaire given to active duty Army Nurse Practitioners through the Department of Nursing at that MEDCEN. The focus of the survey assessed Army NP s knowledge, experience, and reported management of acute low back pain. The appropriateness of the responses to the questions in the survey was evaluated comparing them with the Clinical Practice Guideline of Acute Low Back Problems in Adults No 14:

Assessment and Treatment (1994). These are published by the Agency for Health Care Policy and Research, a division of the U.S. Department of Health and Human Services.

Findings

This section will summarize and discuss the findings as they relate to the specific questions posed in this research. Given the relatively small sample size and the possibility of extraneous variables the discussion will be take into consideration these limitations.

The first research question assessed the experience level of Army NP s. This information was gathered in order to examine its elements as they relate to the conceptual framework of the study. Benner s (1982) Nursing Theory of novice to expert was adapted to provide this framework. This model states that as an individual goes through the acquisition and development of a skill they pass through different levels of proficiency. Utilizing this theory it would seem appropriate to assume that the group of nurse practitioners with the greatest level of experience would score the highest in the three areas of care for acute low back pain. Table 9 summarizes this information.

Table 9.
Experience in years of the respondents as compared to mean percent scores obtained on survey tool

	Mean years as RN	Mean years as advanced Practice	Total mean % score
Family	13 (2-24)	2 (0.5-5)	72
Adult	19 (13-29)	6 (2-12)	77

(minimum-maximum)

The group of respondents with the most experience as expressed as years in the field is the Adult Nurse Practitioners. Interestingly this group also scored the highest total mean percent during evaluation of the responses. This would seem to lend credence

to the Benner model, however, the Family Nurse Practitioners also had similar scores with the least number of years experience. This could possibly be explained by the different training programs or the uniqueness in the specialty focus. Proper elucidation of this issue would require closer examination of the similarities and difference in these areas as they relate to the demonstrated differences in knowledge of acute low back pain between the specialties.

Research Question Two asks if Army NPs access learning opportunities to advance their knowledge of clinical practice guidelines? This portion of the tool was aimed at assessing the respondents as adult learners. Since advanced practice nurses are adult learners this theory applies to the concepts of quality of care through the use of practice guidelines. Knowing and using the clinical guidelines is relevant to their situation, makes them a better provider, and increases the self-image and confidence through their professional competence as they deliver quality care. Adult learning theory acknowledges the presence of external motivators in the adult, but points to the more potent motivators as internal such as self esteem, better quality of life, greater self confidence, and recognition (David & Patel, 1995).

Through the questions regarding reading professional materials, subscribing to journals, and attending training respondents demonstrated that they did seek out and obtain education above their formal training programs. In combining all three of the questions regarding educational opportunities the data showed that the respondents as a group took advantage of 70% of the items addressed. A comparison of these scores with reported satisfaction by nurse practitioners could give more insight into the motivation of the respondents as they relate to adult learning theory.

The third research question asks do Army NP s know and report utilization of initial assessment techniques, clinical care modalities, and special diagnostic procedures of acute low back problems in accordance with the provisions of the clinical practice guidelines as published by the AHCPR? The tool was divided into three sections with multiple questions in order to assess each of the three areas mentioned above. The results from the Nurse Practitioners who responded to the survey are summarized in table 10.

Table 10.
Mean percent correct responses on survey tool as compared to the guidelines of the AHCPR for acute low back pain

	Assessment	Modalities	Diagnostic tests	Total scores
Mean %	69.7	75.2	72	72.3

The assessment section revealed that many of the Nurse Practitioners do not routinely ask important questions during the history-taking portion of the patient encounter. Question regarding the possibility of cancer (20%) and the prolonged use of corticosteriod (30%) are often omitted. The techniques of evaluating the strength of the great toe (20%) and the dorsiflexion strength of the ankle (50%) were also routinely not done during the examination. The Red Flag or danger sign that was consistently ignored was that of constant night pain (20%). These findings point to the possible potential of missing patients with serious disease.

In the treatment modalities portion of the survey it is apparent that Nurse Practitioner do not frequently utilize all interventions proposed as appropriate by the AHCPR guidelines. As a physical treatment modality spinal manipulation (0%) was completely dismissed. NSAIDS (100%) were universally indorsed, but acetaminophen (50%) and muscle relaxants (60%) were not seen as appropriate. Activity

recommendations manifested a greater lack of knowledge with none of the seven recommended by the AHCPR being selected by more than 60% of the respondents. In the area of patient education, as would be expected from the data regarding recommended activities, exercise therapy and stretching (50%) was also shown as an area of weakness in the Nurse Practitioners knowledge of acute low back pain. The overall mean percent scores of the Nurse Practitioners were bolstered by their strong showing in the correct selection of medications considered inappropriate for the treatment of acute low back pain.

In selecting the circumstances that would indicate the need for further diagnostic testing the respondents all recognized parasthesia (100%) as an indicator, but few selected symptoms lasting longer than one month (60%) and symptoms return after four weeks (30%). This particular section suggests an area that could potentially result in missed or late diagnoses. In favor of not having unnecessary expenditures however, the respondents were not fooled by the distracters aimed at eliciting unneeded tests.

Conclusions

In this pilot study the subjects had limited knowledge of care for the patient that presents with acute low back pain. Reported interventions appear to primarily revolve around the prescription of NSAIDS and rest. Since the majority of acute low back pain is self-limited this practice may be appropriate for most patients. However, it predisposes the provider to the ominous possibility of missing the diagnoses of the patient with serious disease. An area particularly worthy of note was the relatively small scores related to patient education. Historically patient education has been considered one of the strength of the nurse practitioner.

The conclusions of this study parallel those forwarded by Little and colleagues (1996). They concluded that there was little adherence to the guidelines by general practitioners (MD s) and that they needed to be more aware of the danger signals or red flags that could herald a poor patient outcome. It was also noted that much of the patient education or advice given by these providers had little basis on scientific evidence.

In 1994, Cherkin, Deyo, Wheeler, and Ciol conducted a study that examined the patterns of diagnostic procedure usage in low back pain among a stratified random sample of physicians. The results demonstrated little consensus within or among the various specialties surveyed regarding appropriate diagnostic testing. Again the results of this study focusing on nurse practitioners mimic those done before. The nurse practitioners demonstrated little knowledge regarding situation that would require more powerful diagnostic imaging studies. As mentioned above, this could lead to a missed or at best late diagnosis of a patient with serious disease such as cancer.

Implications of this study

The major implication for this study points to the need for more aggressive training in the area of acute low back pain. Advanced practice nurses training should focus on the areas of assessment, intervention, and diagnostic testing. In combining this work with earlier studies it becomes clear that most primary care providers, nurse practitioners and general medical practitioner, would benefit from this type of education. The proper tools for the job is an old axiom that applies here. By providing the health care providers with this education, the proper tool, they become more effective and efficient.

As this study and earlier works state, the implementation of the clinical practice guidelines is particularly important in order to promote proven interventions as well as differentiate between those patient requiring minimal care and those patients with serious disease warranting referral. This task would best be accomplished at the medical command level in order to insure consistency and timeliness. The U.S. Army is currently instituting a program to accomplish this goal.

Recommendations for Future Studies

The greatest limitation of the study is its small sample size. Future replication studies should access a larger sample and possibly include all primary care providers in order to compare the different groups in the areas of assessment, interventions, and patient education.

An inter-service study would also provide information on treatment and incidence of acute low back pain in the context of the different missions undertaken by the different services. These studies might also include satisfaction with training opportunities so that inferences can be made regarding motivation and adult learning in the various factions of the U.S. military.

Summary

The goal of clinical practice guidelines is to promote consistent quality care by all providers regardless of their specialty. Adherence to these guidelines has been shown to be an effective technique to obtain consistent care. Knowledge addressing existence, application, and limitations of the guidelines is a critical element in the Nurse Practitioners ability to deliver appropriate care. Nurse Practitioners must be proactive in

implementing and encouraging adherence to the guidelines in order to continue according to their patients cost effective, quality care.

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Attention Clinicians:

The Clinical Practice Guideline on which this Quick Reference Guide for Clinicians is based was developed by a multidisciplinary, private-sector panel comprising health care professionals and a consumer representative sponsored by the Agency for Health Care Policy and Research (AHCPR). Panel members were:

Stanley I. Bigos, MD (Chair)
 Richard G. Richard, MD
 G. Richard Breen, MD
 Kathleen C. Brown, PhD, RN
 Richard A. Deyo, MD, MPH
 Scott Hallemann, MD, PhD, DC
 John F. Hart, DC
 Francis W. Johnson, MD
 Robert B. Keller, MD
 Daniel K. Kido, MD
 Matthew H. Liang, MD, MPH
 Roger M. Nelson, PhD, PTT

Margaret Nordin, Dr. Med. Sc.
 Hermice D. Owen, PhD, RN
 Malcolm H. Pope, Dr. Med. Sc., PhD
 Richard K. Schwartz, MS, OTR
 Donald H. Stewart, Jr., MD
 Jeffrey L. Susman, MD
 John J. Triano, DC, MA
 Lucius Typp, MD, MPH
 Dennis Turk, PhD
 Clark Watts, MD, JD
 James Weinstein, DO

Special consultants to the panel were: Michele Battié, PT, PhD; Claire Bombardier, MD; Norrin Hadler, MD; Alf Nachemson, MD, PhD; Gordon Wacheli, MD; John Holland, MD, MPH and John Webster, MD served as project directors. Project methodologists were David Schriger, MD, MPH and Paul Shekelle, MD, MPH.

An explicit, science-based methodology was employed along with expert clinical judgment to develop specific statements on patient assessment and management on acute low back problems. Extensive literature searches were conducted and critical reviews and syntheses were used to evaluate empirical evidence and significant outcomes. Peer review and pilot testing were undertaken to evaluate the validity, reliability, and utility of the guideline in clinical practice.

This Quick Reference Guide for Clinicians presents a clinical strategy for applying the statements and recommendations from the *Clinical Practice Guideline*. The latter provides a description of the guideline development process, thorough analysis and discussion of the available research, critical evaluation of the assumptions and knowledge of the field, more complete information for health care decisionmaking, consideration for patients with special needs, and references. Decisions to adopt particular recommendations from either publication must be made by practitioners in light of available resources and circumstances presented by the individual patient.

AHCPR invites comments and suggestions from users for consideration in development and updating of future guidelines.

Please send written comments to:

Director, Office of the Forum for Quality and Effectiveness in Health Care
 AHCPR, Wilco Building, Suite 310
 6000 Executive Boulevard
 Rockville, MD 20852

Acute Low Back Problems in Adults: Assessment and Treatment

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 Agency for Health Care Policy and Research
 Rockville, Maryland

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Appendix B

ACUTE LOW BACK PROBLEM (ALBP) QUESTIONNAIRE

1. What do you routinely evaluate during the initial history of patients with acute low back problems? (check ALL that apply)
 - History of cancer
 - Unexplained weight
 - Family history of back problems
 - Is the pain worse at rest
 - Prolong use of corticosteroids
 - History of diabetes
 - History of trauma
 - Urinary retention or incontinence
2. What tests do you routinely evaluate in the initial examination of a patient with acute low back problems? (check ALL that apply)
 - Dorsiflexion strength of ankle
 - Strength of great toe
 - Ankle reflexes
 - Romberg test
 - Touch sensation of lower extremities
 - Straight leg raises
 - Bulge sign
3. What signs and symptoms do you feel justify immediate referral for a patient with acute low back pain? (check ALL that apply)
 - Pain less than 72 hours duration
 - Saddle anesthesia
 - Neurological signs at multiple levels
 - Severe local back pain
 - Constant night pain
4. What physical treatments do you routinely recommend or refer patients with an initial complaint of acute low back problems? (check ALL that apply)
 - Spinal manipulation
 - Ice application
 - Heat application
 - TENS
 - Shoe insoles or lifts
 - Lumbar corsets
 - Back belts
 - Traction
 - Ligament joint injections
 - Epidural injections
5. What medications do you routinely prescribe for patients with an initial complaint of acute low back problems? (check ALL that apply)
 - Acetaminophen
 - NSAIDS
 - Muscle relaxants
 - Opioids
 - Oral steroids
 - Antidepressants
6. What activities do you advise the patient with acute low back problems to participate in? (check ALL that apply)
 - Bed rest > 4 days
 - Bed rest < 4 days
 - No exercising
 - Swimming
 - Walking
 - Running
 - Step aerobics
 - Biking
 - Back specific machines
 - Back extensor exercises after the first 2 weeks of symptoms
 - Back muscle stretches
7. What type of education do you provide to a patient with initial acute low back problems? (check ALL that apply)
 - Activity recommendations
 - Fitting for a lumbar brace
 - Exercise therapy and stretching
 - Medication instructions
 - Body mechanics
8. In what situations do you obtain a MRI, CT scan, EMG or laboratory tests? (check ALL that apply)
 - Patient returns to clinic in 1 week with same complaints
 - Complains of symptoms for greater than 1 month since initial visit
 - Symptoms return after 4 weeks
 - Patient returns to clinic complaining of parasthesia
 - Patient tolerates sitting at work for 50 min

9. What is your most recent certification as a nurse practitioner?
 Family
 Adult
 Other, please specify:
10. How many years have you been in the Army?
Please, specify:
 _____ yrs.
11. How many years have you been practicing as a nurse practitioner? Please, specify:
 _____ yrs.
12. How many hours per week do you read professional material? Please specify:
 _____ hours
13. Do you utilize clinical practice guidelines in your practice setting.
 No
 Yes
14. How often per month do you treat ALBP?
 _____ patients per month

15. In what type of clinic are you currently providing care?
 Family practice
 OB/Gyn (Women's Health)
 Ambulatory care
 Acute care/Emergency
 Other, please specify: _____
16. Do you subscribe to any professional journals? If yes, please list in the space below.
 No
 Yes _____
17. Have you attended any seminars, conferences, or CE opportunities about the management of acute low back problems that addressed clinical practice guidelines since 1994?
 No
 Yes

_____fold here

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Appendix C



UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES
4301 JONES BRIDGE ROAD
BETHESDA, MARYLAND 20814-4799



January 8, 1998

MEMORANDUM FOR CAPT JACK M. DAVIS, GRADUATE SCHOOL OF NURSING

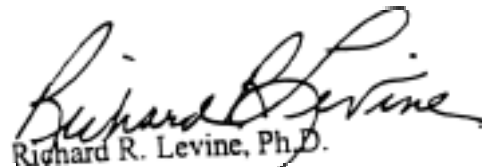
SUBJECT: IRB Review and Approval of Protocol **T06199** for Human Subject Use

Your research protocol entitled “***Reported Knowledge and Management of Acute Low Back Pain by USANP's as Compared to CPGL Published by the AHCPR,***” was reviewed and approved for execution on 1/7/99 as an **exempt** human subject use study under the provisions of 32 CFR 219.101 (b)(2). This approval will be reported to the full IRB, scheduled to meet on 11 February 1999.

The purpose of this study is to determine the knowledge level of low back pain clinical practice guidelines and their use by US Army nurse practitioners. Active duty Army Nurse Practitioners will be surveyed regarding their knowledge, experience, and reported management of acute low back pain. These responses will be evaluated against the Clinical Practice Guideline of Acute Low Back Problems published by the U.S. Dept. of Health and Human Services. No subject identifying information will be collected as part of the survey.

Please notify this office of any amendments or changes in the approved protocol that you might wish to make and of any untoward incidents that occur in the conduct of this project.

Additionally you should provide this office with copies of all site approval letters as they are received. If you have any questions regarding human volunteers, please call me at 301-295-3303.



LTC, MS, USA
Director, Research Programs and
Executive Secretary, IRB

cc: Director, Grants Administration



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Appendix D

Dear Participate,

20 November 1998

As a student at the Uniformed Services University of the Health Sciences I am researching the management of acute low back pain and its correlation with published guidelines such as those of the Agency for Health Care Policy and Research, U.S. Department of Health and Human Services. Numerous studies have been done examining care provided by general medical officers, but few have focused on Nurse Practitioners. The purpose of this survey is to gather information on the knowledge of NP's in regard to: 1.) Initial assessment 2.) Examination 3.) Treatment modalities 4.) Adult learning opportunities for the provider 5.) Experience with low back pain

A great deal of controversy exists regarding standard of care and clinical competency in comparisons made between different types of primary care providers such as Nurse Practitioners and General Medical Officers. In an effort to provide factual information as opposed to opinions on this subject I am examining the knowledge and experience of Nurse Practitioners in the military setting as it relates to acute low back pain. As a Nurse Practitioner in the armed forces your input is critical in this effort to enlighten and more clearly define your role and value in the modern military.

Participation in this study is voluntary. Survey responses will be kept confidential. Data will be analyzed in aggregate form without individual identifiers and no respondents will be identified in any publications. Returned surveys will have no means of linking them with participating individuals. Results will be available to you through the Learning Resource Center of the Uniformed Services University of the Health Sciences. This thesis is under the direction of Dr. Carl Ledbetter, Ph.D., FNP, professor and chair of the USUHS FNP program. Any questions regarding this study may be directed to me at 301-585-6427 The Graduate School of Nursing can be reached at 301-295-1992.

The survey will take approximately 10 minutes to complete. Informed consent is indicated by your returned completed surveys. Please do not indicate your name on the survey. Please return them in the prepaid envelopes as soon as possible, preferably within the next ten days. A response from all elicited Nurse Practitioners will greatly enhance our efforts to elucidate the worth and versatility of Nurse Practitioner in the military health care setting.

Thank you for taking time from your busy schedule to assist as in this effort.

Jack M. Davis, CPT, AN
Family Nurse Practitioner Student
Graduate School of Nursing, USUHS