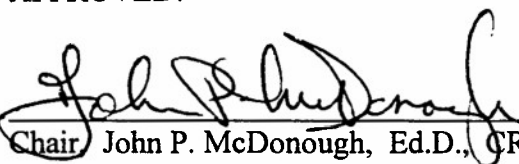


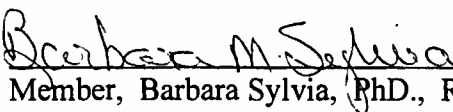


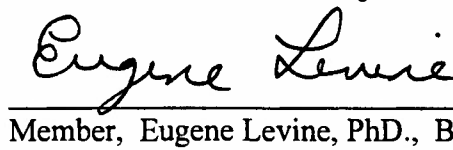
ACUTE PAIN MANAGEMENT SERVICES: WHAT DOES THE AIR FORCE HAVE TO  
OFFER?

Captain Carol Louise Rayos

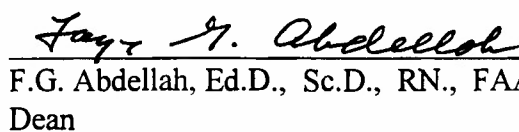
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## ABSTRACT

“Acute pain management services: What does the Air Force have to offer?”

by

Carol Louise Rayos

The purpose of this descriptive study was to assess the prevalence of acute pain management services (APMS), in Air Force medical facilities and examine the roles of anesthesia providers in acute pain management programs. This descriptive study consisted of a telephone survey to all Air Force medical facilities that house an anesthesia department and surgical services. Anesthesia providers in charge of the pain services or chiefs of the anesthesia departments were interviewed about established acute pain programs and practices in their facilities. Each institution was asked questions related to the initiation of a formal APMS, primary goals, services, components of the program, staffing, and familiarity with the Agency for Health Care Policy and Research (AHCPR) guidelines in acute pain management. This study examined current pain treatment programs in the Air Force medical centers and some of the barriers to overcome in improving APMS in the future. Data were analyzed to describe the current status of acute pain services in Air Force facilities and how the services compared to a previous study by Warfield and Kahn (1995) of U.S. hospitals. Air Force medical facilities (45 %) had established as many acute pain management services as U.S. hospitals (42 %). More Air Force facilities provided pain counseling to patients preoperatively than U.S. facilities, but had lower percentages of written components as compared to U.S. hospitals.

ACUTE PAIN MANAGEMENT SERVICES: WHAT  
DOES THE AIR FORCE HAVE TO OFFER?

by

Carol Louise Rayos, BSN

THESIS

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## DEDICATION

Everything that happens in this world happens at the time God chooses. Without His will and strength and guidance, I would not have completed this thesis.

I dedicate this work to my family and friends. Without the unconditional love and support of my fiancée, Daniel, none of this would have been possible.

To my mother and father, Blas and Bernice Rayos, I thank you for giving me that precious start in life. I especially want to thank my brother, J.B. and my sister, Kandace, for having the patience to listen to me when times were tough.

There were many friends who helped me accomplish this great task. Thanks to Gil Seda for your positive reinforcement, and to Conan Matthews for your technical support, and to all my classmates who helped me in along the way.

I dedicate the creation of this thesis, to all these wonderful people in my life. Without their love, encouragement and support the attainment of a dream and the reality of this thesis would not have been possible.

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## CHAPTER ONE: THE RESEARCH PROBLEM

### Introduction

Historically, the management of acute pain in hospitalized, surgical patients has been inadequate, with up to 75% of patients reporting distressing pain (Carr & Song, 1993). Since 1980, several developments in patient-controlled analgesia (PCA), spinal opioid analgesia, and the concept of the anesthesiology-based acute pain management service, allowed for the pain relief of many patients that was clearly superior to that provided by traditional intramuscular opioids (Etches, 1992).

There is also evidence that improved analgesia may be associated with less morbidity and mortality and with lower costs of hospitalization (Carr & Song, 1993). The improvement in delivery of postoperative analgesics such as PCA and intrathecal opioids is dependent on the availability and technical expertise of the interested anesthesiologist, the specialized training and support of nursing staff, and the reliability of complex, electronic infusion devices.

Over the last four decades, anesthesia practice has progressed to the point where it is difficult for the prudent anesthesiology provider to further improve surgical outcome by changes in the intraoperative management of anesthesia (Etches, 1992). However, studies are still reporting that conventional methods of pain control are providing inadequate relief to patients. "High-tech" approaches to analgesia such as intrathecal and epidural opiates, PCA, and regional blocks are requested more often by informed patients (Carr & Song, 1993). Informed patients will demand high-quality medical care to include effective pain control, even pre-emptively when possible.

Anesthesia providers (anesthesiologists and certified registered nurse anesthetists) are a logical choice to provide pain relief in the immediate postoperative period, since they have an interest in the management and understanding of the pathophysiology of pain, expertise in regional blockade, and knowledge of the pharmacology of analgesics (Warfield & Kahn, 1995).

### Problem Statement

Warfield and Kahn conducted a survey to assess acute pain management programs in teaching and civilian hospitals in the United States, information that was not previously available. They found that 42% of the 300 hospitals surveyed have acute pain management programs, and an additional 13% have plans to establish such programs. The literature is lacking on the status of acute pain services that exist in military facilities. Numerous studies have reported military role of anesthesia providers during combat or wartime scenarios, but there is nothing documented on current trends in Air Force, Army or Navy anesthesia services on the topic of acute pain programs.

It was the purpose of this study to examine the prevalence of acute pain management services (APMS) in Air Force medical facilities and survey each institution for its initiation of an APMS, goals, services and components, staffing, and familiarity with the Agency for Health Care Policy and Research (AHCPR) guidelines in acute pain management.

### Research Questions

This research study was conducted using Air Force medical facilities, asking the following questions:

1. How many of the Air Force medical facilities have a formal acute pain management program in existence? What year did these programs begin?
2. What are the types of services and components in the acute pain management program in each medical facilities?
3. Which health care professionals are involved in the acute pain programs? What are the roles of anesthesiologists and certified registered nurse anesthetists (CRNA's) in each service?
4. What are the barriers to overcome to improve/initiate services?
5. Is there a relationship between size and the type of acute pain management program? What is the current trend in pain management consultation?
6. How familiar are the respondents with the AHCPR guidelines? Have these guidelines influenced their acute pain services?
7. How do Air Force pain management programs compare with U.S. hospitals surveyed in Warfield and Kahn's study (1995)? Are there any significant differences between Air Force facilities and U.S. hospitals?

### Conceptual Framework

This research was based on the principle of pain management. It focused on the establishment of formal pain programs to address the issues of inadequate pain control of patients and its consequences. The conceptual framework for this research is based on the works of two key authors. The first is J.J. Bonica (1953) who founded one of the first multidisciplinary pain centers and advocated a formal approach to manage acute and chronic pain syndromes. His works will be discussed further in Chapter Two. The second

key author consists of a panel of health care professionals who developed a list of guidelines to address the care of patients with acute pain after operations, medical procedures, or trauma.

The Agency for Health Care Policy and Research was created in 1989 by Congress under Public Law 101-239 (Omnibus Budget Reconciliation Act of 1989) to enhance the quality, appropriateness, and effectiveness of health care services and to improve access to that care (AHCPR Publication No. 92-0032, 1992). AHCPR guideline addresses the care of patients with acute pain after operation, medical procedures, or trauma. It outlines the physiological basis for pain and cites clinical studies linking effective postoperative pain management with improved patient outcomes.

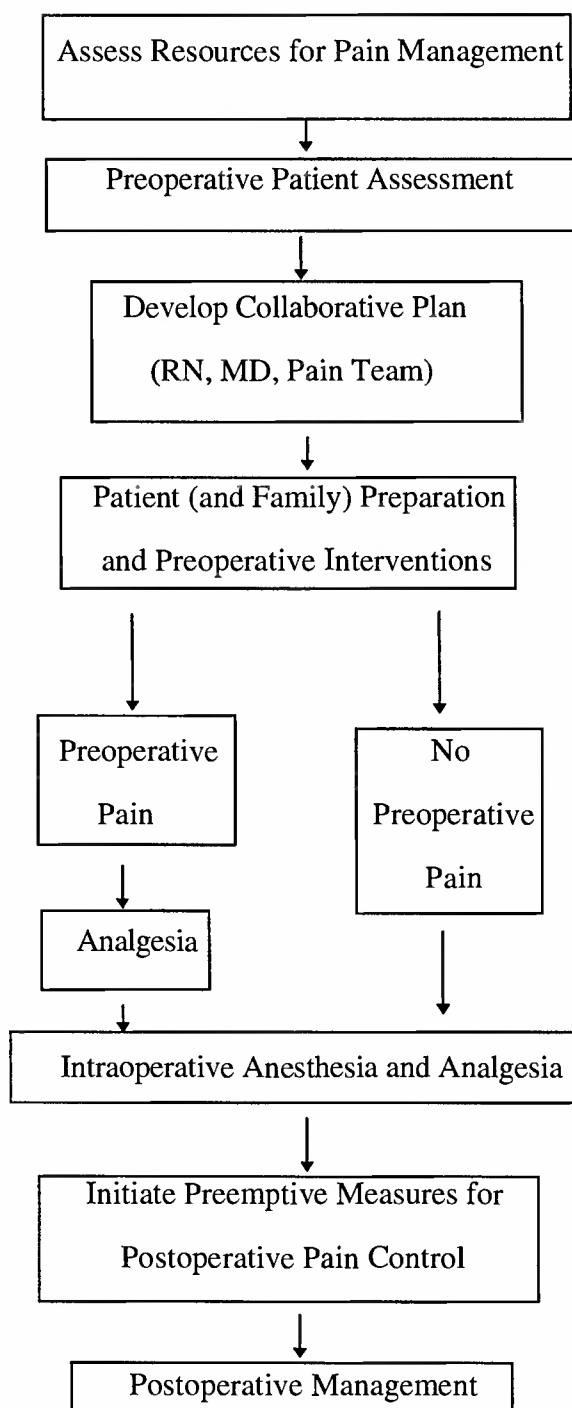
The guideline describes practices that can minimize or eliminate acute pain. Rigid prescriptions for postoperative pain control are inappropriate because patients vary greatly in the severity of their pre-existing pain, medical conditions, and pain experiences; the extensiveness of pathology and associated operations; responses to interventions; personal preferences; and the settings in which they receive care. Instead, this guideline offers clinicians a coherent yet flexible approach to pain assessment and management in daily practice.

The AHCPR guideline on acute pain management has four major goals. One is to reduce the incidence and severity of patient's postoperative or posttraumatic pain. The second is to educate patients about the need to communicate unrelieved pain so that they can receive prompt evaluation and effective treatment. The third goal is to enhance

patient comfort and satisfaction. The last goal is to contribute to fewer postoperative complications and, in some cases, shorter stays after surgical procedures.

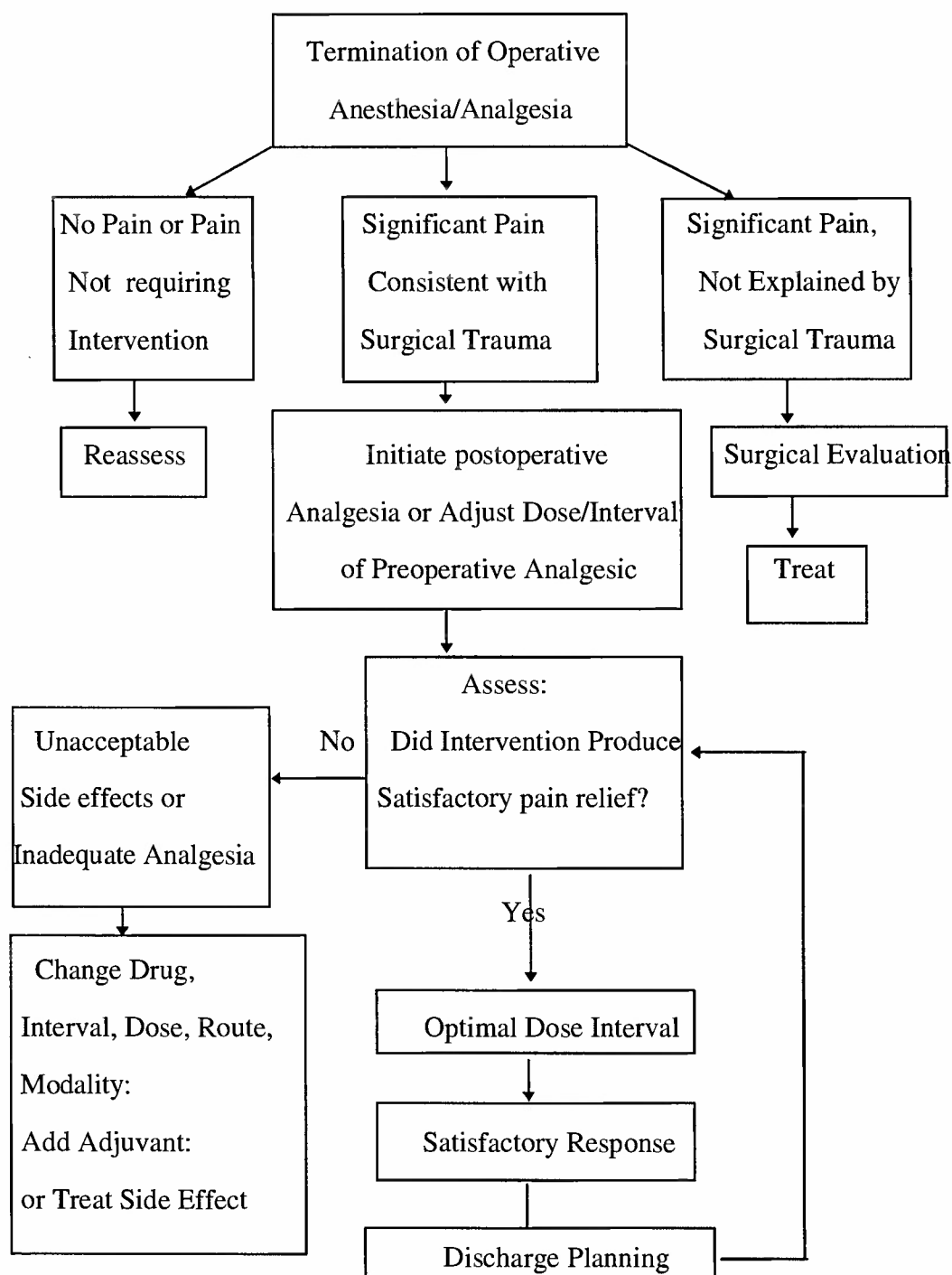
The guideline outlines the physiological basis of pain and summarizes clinical studies linking effective postoperative pain management with improved patient outcomes. This guideline has been outlined in a Pain Treatment Flow Chart as shown in Figures 1 and 2.

**Figure 1. Pain Treatment Flow Chart: Pre-and Intraoperative Phases**



AHCPR Publication. (1992). Acute Pain management: Operative or Medical Procedures and Trauma, p. 9.

**Figure 2. Pain Treatment Flow Chart: Postoperative Phase**



AHCPR Publication. 1992. Acute Pain Management: Operative or Medical Procedures and Trauma, p. 10.

AHCPR believes the reporting of pain is a social transaction between caregiver and patient. Successful assessment and pain control depends in part on establishing a positive relationship between health care providers, patients, and when appropriate, their families. As noted in the flow charts (Figures 1 and 2), the subject of postoperative pain and its control is a critical part of the initial review of all relevant aspects of the planned procedure. The surgeon should discuss this with the patient and family. Pain assessment and management issues should be a part of the preoperative workups of the anesthesia and nursing staffs. Patients and their families should be informed that pain reports are valuable, and also that pain may be a sign of surgical complications that demand prompt diagnosis and therapy. To aid in planning and discussing pain control strategies with the patient, a member of the anesthesiology department should obtain a pain history during the preoperative visit.

The guidelines suggest after the preoperative assessment is complete (as noted in Figure 1), the health care team should develop a pain management plan in collaboration with the patient. When developing the pain management plan, clinicians must consider the relative risks, benefits, and costs of available pain control options. They should also attempt to correct patient misconceptions about the use of pharmacologic methods. Once a pain management plan is in place, preoperative preparation of the patient is important for them to understand their responsibilities in pain control. To ensure that pain measurement is valid and reliable, the staff should review the selected pain measurement tool with the patient before surgery. Patient preferences for pain control should be supported.

Assessment of pain after surgery must be continued frequently and made simple. Once the patient has recovered from anesthesia, the mainstay of pain assessment should be the patient's self-report to assess pain perceptions and cognitive responses. At the institutional level, periodic evaluations should be conducted to monitor the effectiveness of pain assessment and management procedures. Without institutional support for an organized process by which pain is recognized, documented, assessed, and reassessed on a regular basis, staff efforts to treat pain may become sporadic. Before a patient's discharge, those taking care of the patient should describe the interventions used to manage pain and assess their effectiveness and satisfaction. This is important when initial management was unsuccessful and/or when side effects or other complications occurred.

As illustrated in the flow chart, the process of postoperative pain management is ongoing. Following intraoperative anesthesia and analgesia, postoperative pain assessment and management begin. Based on the preoperative plan, postoperative drug interventions are initiated. Patients should be reassessed at frequent intervals to determine the efficacy of the intervention (not less than every 2-4 hours for the first 24 hours) in reducing pain. If the intervention is ineffective, additional causes of pain should be considered, and the plan should be reevaluated. Inpatients, as well as ambulatory surgical patients, should be given a written pain management plan at discharge. This information should include specific drugs to be taken, special precautions to follow, any physical limitations, and the name of the person to notify about pain problems and other postoperative concerns.

The Acute Pain Management Guideline Panel recommends that any hospital in which abdominal or thoracic operations are routinely performed offer patients postoperative regional anesthetics, epidural or intrathecal opioids, PCA infusions, and other interventions requiring a similar level of expertise, under the supervision of an acute pain service. For pain management to be effective, each hospital must designate who or which department will be responsible for all of the required activities.

#### Variable Delineation

The major variables identified in this study were:

1. Prevalence of APMS and initiation of an APMS
2. APMS type
3. Goals, services and components
4. Staffing
5. Familiarity with the AHCPR guidelines
6. Barriers to APMS
7. Trends in use of services including same day surgery.

#### Definition of Terms

For the purpose of this study, the following terms have been operationally defined:

Air Force medical facilities. Institutions providing medical care to active duty, dependents and retirees, ranging from no in-patient beds (clinic) to tertiary medical facilities (> 500 beds).

AHCPR guidelines. Clinical guideline that outlines procedures to minimize the incidence and severity of acute pain after surgical and medical procedures and

pain associated with trauma in adults and children.

Acute pain management services. A formal institutional approach to the management of acute pain, with clear lines of responsibility and written guidelines.

Barriers. The factors that tend to restrict the free movement of an organization toward the initiation or maintenance of acute pain management services.

Role. The characteristic and expected social function of an individual.

Health care professionals. Persons involved in the delivery of medical services.

Anesthesiologist. Physician specializing in anesthesiology; the medical study and application of anesthetics.

Certified Registered Nurse Anesthetist (CRNA). A registered nurse specialized in and certified to safely administer an anesthetic.

#### Assumptions

The assumptions for this study were:

1. Subjects will respond to the survey accurately and honestly.
2. Anesthesia departments are involved in acute pain management services in the Air Force.

#### Limitations

The limitations of this study include:

1. Those responding are not representative of those who chose not to respond.
2. There is no Air Force directive on guidelines or protocols to mandate an acute pain management service.

3. The responses of the questions were limited by the multiple choice-type of answers to the questions, leaving no room for open-ended answers.

4. There was a historical limitation when comparing U.S. hospitals to Air Force hospitals, since this current study was completed in 1997, and Warfield's study was conducted in 1993 and published in 1995.

### Background of the Problem

Approximately 23.3 million operations are performed yearly in the United States, and most of these involve some form of pain management (AHCPR, 1992). Clinical surveys continue to indicate that routine orders for intramuscular injections of opioid as needed, fail to relieve pain in about half of postoperative patients (Donovan, 1983; Oden, 1989; AHCPR, 1992). Postoperative pain contributes to patient discomfort, longer recovery periods, and greater use of scarce health care resources and may compromise patient outcomes.

There is wide variation in the methods used to manage postoperative and other acute pain, ranging from no set strategy to a comprehensive team approach as advocated in the clinical practice guideline, Acute Pain Management: Operative or Medical Procedures and Trauma. Clinical Practice Guideline (1992). This guideline sets forth procedures to minimize the incidence and severity of acute pain after surgical and medical procedures and pain associated with trauma in adults and children.

### Rationale and Significance of the Problem

Although it is not practicable or desirable to eliminate all postoperative and other acute pain, an aggressive approach to pain assessment and management can reduce such

pain, increase patient comfort and satisfaction, and in some cases, contribute to improved patient outcomes and shorter hospital stays (Carr & Song, 1993; AHCPR, 1992).

Guidelines such as that published by the AHCPR on acute postoperative pain management emphasize a collaborative, interdisciplinary approach to pain control, including input from the patient; aggressive use of both drug and non-drug therapies; assessment and frequent reassessment of the patient's pain; and a formal, institutional approach to pain management. Warfield and Kahn (1995), surveyed 164 hospitals and found that although 96% of those hospitals contained written guidelines and quality assurance measures, only 53% provided a list of procedures regarding postoperative pain management.

Optimal use of pain control methods depends on cooperation among different members of the health care team throughout the patient's course of treatment. To ensure that this process occurs effectively, formal means must be developed and used within each institution to assess pain management practices and to obtain patient feedback to gauge the adequacy of pain control. There is limited information available on the existing pain services available in Air Force medical facilities, and the role that anesthesia departments play in this area. The purpose of this survey is to fill this gap.

#### Theoretical Basis of the Problem

No matter how successfully conducted, surgical operations produce tissue trauma and release potent mediators of inflammation and pain (Coderre, 1992). Pain must be conceptually defined. Melzack and Wall (1965), describe the concept as, "a linguistic label for a rich variety of experiences and responses." Pain is an unpleasant sensory or

emotional experience arising from actual or potential tissue damage or described in terms of such damage, according to the International Association for the Study of Pain, (Mersky, 1964).

Pain is one response to the trauma of surgery. In addition to the stress of surgical trauma and pain, substances released from injured tissue evoke "stress hormone" responses in the patient. Such responses promote breakdown of body tissue; increase metabolic rate, blood clotting, and water retention; impair immune function; and trigger a "flight or fight" alarm reaction with autonomic features ( e.g. rapid pulse) and negative emotions (Bonica, 1953).

Pain itself may lead to shallow breathing and cough suppression in an attempt to "splint" the injured site, followed by retained pulmonary secretions and pneumonia (Sydow, 1989). Unrelieved pain may also delay the return of normal gastric and bowel function in the postoperative patient (Bonica, 1953).

Pain is dynamic. Without treatment, sensory input from injured tissue reaches spinal cord neurons and causes subsequent responses to be enhanced (AHCPR, 1992). Pain receptors in the periphery also become more sensitive after injury. Recent studies demonstrate long-lasting changes in cells within spinal cord pain pathways after a brief painful stimulus (Fitzgerald, 1990). Such physiological studies confirm long-standing clinical impressions that established pain is more difficult to suppress (Bonica, 1953; Melzack & Wall, 1965).

The physiological and psychosocial risks associated with untreated pain are greatest in: frail patients with other illnesses such as heart or lung disease, those

undergoing major surgical procedures, and the very young or very old. Because of advances in surgical and anesthetic techniques, it is now common for such patients to undergo operations once dismissed as prohibitively risky (AHCPR, 1992). It is these complex types of cases which would benefit from a formalized acute pain management service. Pilot studies show the benefits of aggressive pain treatment which indicate that postoperative morbidity and mortality decrease in high-risk populations such as the very young, or very old, when postoperative care includes aggressive pain relief.

The tool for this study was borrowed from the 1995 survey by Warfield and Kahn, on acute pain management in U.S. hospitals. They found that 92% of respondents cited controlling postoperative pain as a primary goal of their pain management program. Of the services they provided, 95% involved patient controlled analgesia, 92% in consultation, 91% in direct patient management, 86% in continuous nerve blocks, and 86% in intraspinal opioids.

When Warfield and Kahn surveyed leadership roles of the APMS, they found that 80% were headed by an anesthesiologist. Other professionals on the team included nurses (89%), pharmacists (68%), and surgeons (47%). This led to the question, "What services does the Air Force have to offer in acute pain management and what are the roles, responsibilities and services offered by providers in anesthesia?"

## CHAPTER TWO: REVIEW OF THE LITERATURE

### Introduction to Review of the Literature

In the past, postoperative pain was thought to be inevitable, a harmless though intense discomfort that the patient had to tolerate (AHCPR, 1992; Bonica, 1953). It is well known that acute postoperative pain is a complex physiological reaction to tissue injury, visceral distention, or disease. It is a manifestation of the autonomic, psychological, and behavioral responses that result in an unpleasant, unwanted sensory and emotional experience. The term, nociception, derived from *noci* (Latin for harm or injury) is used to describe the neural responses to traumatic or noxious stimuli. Unrelieved pain due to this nociception, after surgery or trauma is often unhealthy, but it is preventable or controllable in a majority of cases. Patients often perceive postoperative pain as one of the more ominous aspects of undergoing surgery. Historically, the treatment of pain has been given a low priority by both surgeons and anesthesiologists. As a result, patients previously accepted pain as a requisite part of the postoperative experience.

Recognition of the widespread inadequacy of pain management has prompted recent corrective efforts within multiple health care disciplines, including surgery, anesthesiology, nursing, and pain management groups (Ready et al., 1988). With the development of an expanding awareness of the pathophysiology of pain impulses, more attention is being focused on pain management to improve quality and reduce morbidity. The natural progression of this focus is the formation of a postoperative analgesic service or acute pain service, involving specialists in pain management.

The importance of pain management is further increased when additional benefits

for the patient are realized--earlier mobilization, shortened hospital stay, and reduced costs (AHCPR, 1992). If inadequate pain management results from a clinician's conflict between reducing pain and avoiding potential side effects and/or legal liability, achieving greater technical competence and knowledge of risks and benefits can help to reduce such conflicts.

The role and involvement of military anesthesia providers in an active acute pain management services can have a significant impact on the role of medical readiness. In combat scenarios, the reliance of high-tech electronic infusion devices such as the PCA or PCEA will not be an option for the anesthesia provider. The ability to expertly and efficiently manage acute pain with the acquired skill of regional blocks, and the knowledge of the pharmacology of oral and intravenous/intramuscular analgesics due to battle-related injuries becomes paramount to the successful mission for the combatants. The literature is scant on the establishment of acute pain services in military anesthesia departments. The purpose of this study is to fill that gap.

This chapter reviews the major studies conducted over the past 20 years on pain attitudes by patients and professionals, the significance of regional anesthesia and analgesia on surgical outcomes, and programs recently established to manage postoperative pain.

### Review of the Literature

During the first six decades of this century, progressive advances were made in the development of systemic analgesics made possible by synthetic chemistry (Bonica, 1953). It was during this time frame that two physicians, John Bonica and Benjamin

Crue, began extensive careers in the diagnosis, treatment and management of all types of pain syndromes, both surgical and non-surgical types. John J. Bonica, an anesthesiologist, published a book titled, "The Management of Pain" in 1953. This was the beginning of the systematic treatment of pain in which pain was regarded as a medical entity in itself.

The first multidisciplinary pain centers were founded over 30 years ago by Bonica and Crue (Aranoff, 1993). Although different in structure and conceptual framework, both radically changed the treatment of patients with chronic and acute pain syndromes and served as prototypes for the pain centers that followed. As pioneers in the pain movement, both Bonica and Crue advocated the multidisciplinary team approach to manage acute and intractable chronic pain syndromes. Despite this, there were some fundamental differences in regard to the role of invasive treatments in their pain programs. Bonica, an anesthesiologist, more frequently used nerve blocks diagnostically or therapeutically. Crue, a neurosurgeon, viewed chronic nonmalignant pain more as a psychosomatic process, rarely used invasive techniques, and advocated a more behavioral-psychosocial approach. Despite these different viewpoints, both programs were successful. Even now, it is unclear whether one approach is preferred over the other. There is not adequate statistical data to condemn or support pain programs that use either invasive techniques or extensive academic evaluations. This is part of the problem.

Throughout the 1960s, pain centers were rare in the United States and even less common outside this country. These facilities were on the fringes of medical acceptability during the early 1970s (Aranoff, 1993). Patients who had multiple surgeries or numerous

nerve blocks were not considered to have been treated radically, and yet, patients treated in pain programs with operant conditioning, biofeedback, and psychotherapy often caused conflict.

In 1976, there were approximately 30 major comprehensive pain centers distributed throughout the United States. By 1983, the number of alleged pain programs had grown to more than 1000. These numbers came from questionnaire surveys conducted by the American Society of Anesthesiologists and there have been no attempts to validate the accuracy of the information. It was suggested that there were differences in methods, program content, and delivery systems in these various facilities. However, details regarding their efficacy were not available.

Bonica's work (1974) on pain centers focused primarily on chronic pain syndromes. Acute pain refers to pain of short duration, and self-limiting, as is the case in acute pathologic conditions such as postoperative incisional pain or labor pain. Acute pain differs from chronic pain because its cause is usually known, it is temporary, and located in the area of trauma or damage, and it resolves spontaneously without healing. Only recently has the interest and significance of high-tech analgesics and acute pain management programs been published. This will be reviewed next.

Acute pain has been undertreated for many reasons. There are at least 3 major factors that contribute to the inadequacy of traditional analgesic therapy (Oden, 1989; Warfield, 1993). Training in appropriate pain assessment and incomplete understanding of analgesic pharmacodynamics by providers is the first problem. This lack of knowledge is coupled with the belief that the use of opioids has a high risk of respiratory depression and

potential for addiction, and leads to inadequate doses. Secondly, systemic factors, such as the logistics of administering narcotics often leads to a long lag period between the onset of pain and the administration of pain-relieving drugs. A third barrier to adequate analgesia describes the attitudes and expectations of patients. The surgical patient in pain, who is in a dependent situation, may lack the fortitude to request appropriate medication, until the pain becomes unbearable.

The tendency on the part of providers to select nontherapeutic doses of opioid analgesics is most likely influenced by an overestimation of narcotic addiction. In a study by Porter and Jick (1980), only 4 of 11,882 patients became addicted during hospitalization. Since physical dependence requires the regular administration of optimal therapeutic dosage of opioids four to six times daily for six weeks, there are no valid reasons to withhold effective doses of opioids. Himmelsbach (1943) found the incidence of addiction to be 1 in 4,000 hospitalized patients who have received narcotics. This is one of the pain myths in which pain management experts can educate providers and improve patient outcome (AHCPR, 1992).

Donovan (1983) examined general surgical patients in a study of patient attitudes toward postoperative pain relief. Eighty-six per cent of the patients reported satisfaction with their postoperative pain relief despite the fact that 62 % reported significant pain. When questioned as to why they were satisfied with pain relief despite unrelieved pain, 75 % of the patients responded that it was because they expected pain after the operation; 52 % because the pain was less than expected; 50 % because they knew they would get better; and 26 % because they knew why they had pain. The goal of the AHCPR

guidelines are directed so that patients will become more aware that their pain can be relieved and that they do not have to expect unrelieved pain as a necessary afterthought of surgery. In Warfield and Kahn's study (1995), it was reported that 77 % of adults reported pain after surgery, with 80 % of these patients experiencing moderate to extreme pain.

Recently, in the past decade, the numbers of articles in the medical journals have increased that describe successful establishment of acute pain services or programs started in the U.S. Some of these programs have incorporated the suggestions by the AHCPR guidelines. One such group, Duncan and Otto (1995), found that they could successfully incorporate the AHCPR pain management guidelines into their clinical pathways in a pilot study on a pediatric unit in a regional medical center in Kansas City. From their sample of 20 patients, ten were enrolled in the acute pain pathway and ten patients received routine pain orders. Time of onset of pain to pain relief averaged one hour and administration of first dose of analgesia was within 30 minutes. The physician, nurse, and patient satisfaction rating was high. Patients not on the pathway did not have a consistent assessment, plan of management or documentation. The time of onset of pain to pain control was approximately 12 hours.

It is known that postoperative pain relief is often inadequate. Ignorance and misconceptions about opioids by staff contribute to this poor management. The introduction of acute pain teams has done much to improve pain relief for patients. It may also have contributed to changes in attitudes and knowledge of medical and nursing staff. In the study by McLeoud, Davies and Colvin (1995), the majority of staff members that

used PCA analgesia (96 %), were more optimistic about its benefits than those providers who used traditional pain methods. Over two-thirds (71 %) of staff thought nursing workload had decreased with use of PCA. The establishment of acute pain teams can significantly impact the knowledge and attitudes of staff in relation to postoperative pain techniques.

Libreri (1995) reported the results of a quality assurance survey of nurses and surgeons on an acute postoperative pain service managed by the anaesthetic department of a metropolitan teaching hospital. Since its initiation in 1990, the service had managed the postoperative pain of over 1700 patients with PCA, epidural and other regional analgesia. Libreri's study found that 97 % of nurses and 92 % of the doctors believed that patients whose pain is well managed have fewer postoperative complications and shorter hospital stays than patients whose pain is not well managed. To manage PCA and epidural analgesia a support system such as an acute pain service is required. Initiation of such a service may encounter resistance from nurses and surgeons who believe that splitting responsibilities interferes with patient management.

The greatest difficulty encountered in hospitals which attempt to establish a pain service is the low priority given to funding pain relief. Lack of funding causes problems in delivering an adequate service or discourages those who are trying to introduce a new service.

Only 6 % felt that the pain service interfered with their patient management and most (95 %) were satisfied with, or would like more, involvement by the pain service. More than half of the nurses (52 %), indicated that the service decreased their workload.

Seventy-four per cent of nurses and 62 % of doctors wanted the anesthesia department to continue to manage the pain service because they felt that anaesthetists were appropriately qualified for the role. Libreri found that 65 % of the nurses were in favor of expanding use of epidurals and other regional analgesia, as compared to 72 % of physicians who supported an increased use of postoperative epidural techniques. This finding may reflect less experience on the part of the staff with this technique. Libreri's study suggested that an acute pain service can be successfully introduced and well accepted by both nurses and surgeons.

Ready and Wild (1989), report that training and manpower is the key element to successfully organize an acute pain service. Patients are becoming increasingly aware of advances in postoperative pain control. With this awareness comes the demand for contemporary care when surgery becomes necessary. Availability of programs that provide superior analgesia may offer a competitive edge to institutions seeking to attract surgical patients.

Ready et al. (1988), wrote an article on an acute pain service formed by the anesthesia department and the nursing services to administer epidural narcotics. During the first 18 months of service, they provided 623 patients with epidural narcotics. Of those numbers, only four cases of marked respiratory depression occurred. Respiratory depression had not been seen in PCA usage. Ready et al. found that the average number of 'care' days was 3.8, with a range of 1-11. A daily fee for care provided by the APS is submitted beginning with the first postoperative day and continuing until analgesia therapy reverts to the surgical team. The daily consultation charge is the same professional fee

regardless of type /epidural versus PCA/. Procedural fees ie epidural catheter insertion are a separate charge. The hospital charges for respiratory monitoring and PCA pumps. In their case discussion, Ready (1988) reported that third party carriers provided reimbursement, and the collection rate was comparable to that associated with operating room anesthesia for surgery. Reimbursement after 18 months, had reached a level where the APMS was self-sustaining.

Sullivan, Muir, & Ginsburg (1994), conducted a survey on the clinical use of epidural catheters for acute pain management with a sample of 42 hospitals. The purpose of the survey was to determine the usual clinical practice at hospitals that administer epidural analgesia. Of these institutions, 92 % reported that patients with lumbar epidural catheters were placed on general medical/surgical units. Hourly monitoring for the first 12 hours was completed at 38 out of the 42 hospitals, and only seven of the hospitals routinely used pulse oximeters and apnea monitors. Ninety-eight percent of the responders allowed patients to ambulate with assistance, provided there was no motor deficits. These results can be used to show current clinical practices in the management of epidural catheters in U.S. hospitals. These findings were consistent with the results by Nowakowski (1993), who completed a similar study on the usage of epidurals in an APS.

The next question to explore is: Does outcome change with pain management practices? Most areas of acute pain management lack definitive outcome studies, yet epidural analgesia data do exist. Subsets of postoperative patients have been studied includ cesarean section, morbidly obese, vascular surgery, and high-risk surgery patients. The most frequently cited data on analgesia outcome come from the work of Yeager,

Glass, and Neff. (1987). who examined 53 patients scheduled for high risk surgery. Twenty-eight patients received epidural analgesia postoperatively, and 25 received IV opioids. The results dramatically reported that morbidity, complication intensity, ICU stay, and mortality rates were significantly lower in the epidural group, as were physician and hospital costs.

Yeager, Glass, & Neff (1987), provided the first of many studies to demonstrate that controlled and appropriate use of adequate anesthetic and analgesic techniques (i.e. epidurals), reduce postoperative morbidity and the stress response to surgery. The surgical stress response can peak during the preoperative, intraoperative, or postoperative period, with major effects on the cardiac, coagulation, and immune systems. Serum concentrations of some stress response mediators correlate with the magnitude of surgery and with ultimate patient outcome.

Bromage, Shibata, and Willoughby (1971), demonstrated the potential effect of postoperative pain management on the hyperglycemic response to surgery. They studied patients undergoing upper abdominal or thoracic surgery and randomized them to receive either epidural and light general anesthesia with postoperative epidural analgesia or general anesthesia alone and parenteral opioids for postoperative pain relief. They found that the hyperglycemic response was reduced in the group who received epidural analgesia.

PCA IV opioids for postoperative analgesia can provide effective analgesia, yet the stress response is unaltered (Moller, Dinesen & Sondergard, 1988). In contrast, epidural administration of local anesthetics can completely suppress the stress response to

surgical procedures performed below the level of the umbilicus. The epidural local anesthetics block conduction in sympathetic efferents, such as those innervating the adrenal glands. The greatest inhibition of the stress response is observed when epidural anesthesia with local anesthetics is initiated preoperatively and continued with local anesthetics and opioids for postoperative analgesia (Barash, Cullen, & Stoelting, 1993).

Cardiac morbidity is the primary cause of death after anesthesia and surgery with reported incidences in high risk populations of 2-15 % (Morgan & Mikhail, 1996). Activation of the sympathetic nervous system by surgical stress and pain is thought to increase the incidence of perioperative myocardial ischemia and infarction. Selective blockade of cardiac sympathetic innervation should decrease perioperative myocardial ischemia and can be achieved by administering local anesthetic through an epidural catheter placed at the upper thoracic level.

Major surgery performed under general anesthesia with postoperative parenteral opioid analgesia is associated with a hypercoagulable state which persists into the postoperative period, and is associated with vasoocclusive and thromboembolic events. Although the etiology of the increase in coagulability is uncertain, the stress response plays a role in the postoperative changes that include increased concentrations of coagulation factors, enhanced platelet activity, and impaired fibrinolysis. Epidural anesthetics can increase lower extremity blood flow through blockade of sympathetic efferents, enhance fibrinolytic activity, and inhibit platelet aggregation (Yeager, Glass, & Neff, 1987). Reduced incidences of vascular graft occlusion and thromboembolic complications are associated with the use of epidural anesthesia and analgesia.

Postoperative ileus is a major surgical morbidity with financial costs of at least 750,000 dollars annually. It is thought that abdominal pain activates a spinal reflex arc which inhibits intestinal motility. Both nociceptive afferents and sympathetic efferents are believed to be key initiators of the ileus. Epidural anesthetics can theoretically improve bowel motility through neural blockade of both pathways. Postoperative epidural analgesia with local anesthetics has been associated with earlier passage of flatus and bowel movements than observed with systemic opioid analgesia. Significant improvements in recovery of gastrointestinal function have been documented. Epidural anesthesia and analgesia may be associated with reductions in incidence and severity of many perioperative physiological events (Morgan & Mikhail, 1996; Yeager, Glass, & Neff, 1987).

Pain is a form of stress and produces elevation in stress hormones and catecholamines. Good pain management has been shown to result in shorter hospital stays, improved mortality rates (especially in patients with less physiologic reserve), such as those in intensive care units, better immune function, less catabolism and endocrine derangements, and fewer complications. Specific benefits have been shown for patients undergoing specific procedures. Patients who undergo amputation under a regional block with local anesthetics have a decreased incidence of phantom pain. Patients in whom a vascular graft is placed have a lower incidence of thrombosis. A decreased mortality rate has been shown in patients with flail chests who have epidural analgesia (Yeager, Glass, & Neff, 1987).

Recent studies have shown the value of preemptive analgesia in some surgical situations. The blockade of the pathways involved in pain transmission before surgical stimulation may decrease the patient's postoperative pain (Morgan & Mikhail, 1996). Local infiltration along the site of skin incision in patients having inguinal hernia repairs with general anesthesia is beneficial if the infiltration is done before the skin incision (AHCPR, 1992). Several studies using intravenous or epidural opiates in patients having thoracotomies and hysterectomies have also shown a preemptive effect. Further studies with larger patient groups are needed to provide definitive answers regarding preemptive analgesia.

A key aspect to the initiation of an APMS is the identification of patient populations that are most likely to benefit from improved postoperative pain management. Patients undergoing thoracic and upper abdominal procedures, major orthopedic operations such as hip surgery, and high-risk vascular surgery are examples of groups in whom effective postoperative pain management will produce the most successful outcome (Barash, Cullen, & Stoelting, 1992).

As outlined in Chapter One, the framework for this research would not be complete without the original concepts proposed by Bonica on pain management. He believed in order to deal with complex pain problems, it is often necessary for the patient's health care provider to enlist the aid of one or more specialists and health professionals (Bonica, 1974). He asserted that, "the management of patient's with complex pain problems is best achieved through the well-coordinated and concerted efforts of the patient's doctor and a group of specialists who contribute their individualized knowledge

and skills for the common goal of making a correct diagnosis and planning the most effective therapeutic strategy” (p. 433).

Bonica advocated this approach and described the concept of the multidisciplinary pain management team over 40 years ago. His interest and research in the field of pain syndromes and management began in the military.

It was Bonica's experience with military personnel during World War II and with civilian patients after the war that led to his advocacy of the multidisciplinary team approach to pain therapy. Bonica's experiences prompted him in 1951 to lecture and publish papers on the multidisciplinary pain management concept. Despite these efforts the concept was ignored by the medical profession until the 1970s.

Bonica's conceptual framework, (based on trial and error in the establishment of his own multidisciplinary pain treatment facility), is the foundation upon which acute pain management services are organized and function today. Bonica's conceptual framework for the success of the multidisciplinary pain management team is based on the following premises:

1. Development of such a comprehensive team is a slow process, particularly when other specialties in the profession tended to discourage group efforts and referred to this concept as "pain treatment by committee."
2. There will be slightly changing group emphasis as new members, representing disciplines previously not represented in the group, join the team.
3. Patients will, unfortunately, usually be referred to the facility after too many wrong therapies have been applied and failed and the patient has been subjected to

prolonged needless suffering and developed a "true pain habit."

4. The success rate varied with each of the numerous syndromes represented by the population. The purpose is not to make a correct diagnosis 100% of the time nor to eliminate the pain permanently in all patients. The rate of success is better than that obtained by practitioners working alone as a member of a specialty group or as a member of a general medical or surgical clinic.

5. One of the most important benefits of the multidisciplinary team concept is the esprit de corps and the continuous exchange of information among its members. This broadens the knowledge and perspective of the members so that they can better employ their professional talents during a diagnostic workup or consultation or both.

6. This approach attracted more basic scientists interested in pain research, which led to the development of therapeutic applications with direct clinical relevance in pain management.

Bonica stated that the key to success of such complex multidisciplinary efforts is in effective organization of the personnel and ample physical facilities, equipment, and financial resources. Although he was referring to chronic pain syndromes, the conceptual model applies to a formalized approach to acute pain management.

He envisioned and described such concepts that are recently being placed into practice. He recommended to the scientific community and to all clinicians involved in pain therapy to develop mechanisms that will permit a national health agency or a professional society to develop guidelines and criteria that may be used by various facilities organized for the treatment of patients with pain. This recommendation became

a reality, when in 1991, the International Association for the Study of Pain published its quality assurance standards for the relief of acute and chronic pain (American Pain Society, 1991).

A third recommendation by Bonica (1974) dealt with the classification of pain treatment facilities. Bonica defined the term "pain center" to be used for units that are hospital based, have inpatient and outpatient facilities, have persons from several disciplines and ample equipment to diagnose and treat multiple pain syndromes and should have teaching/residency programs, and be affiliated with research centers. The term "clinic" should be used for facilities that manage patients in outpatient hospital clinics or in non-hospital settings such as physician offices.

Finally, he recommended that centers and clinics that are involved in the treatment of acute and chronic pain syndromes be classified according to goals and objectives, personnel and equipment and facilities:

1. Comprehensive multidisciplinary pain centers- have at least six different specialties and carry out comprehensive programs in patient care, teaching, and research.
2. Multidisciplinary pain clinics facilities- have two to five different specialties and are in patient care and teaching.
3. Syndrome-oriented pain centers- clinic modality oriented pain centers.
4. Single disciplinary pain clinics.

### Summary

The beginning of the systematic treatment of pain in which pain was regarded as a medical entity in itself started with Bonica. He launched the first recommendations for

formal pain management systems with the publication of his book in 1953, titled, "The Management of Pain". Throughout the next few decades, landmark studies were written on the inadequate analgesics provided to patients in hospitals, misconceptions and attitudes of providers concerning parenteral opioids, and clinical reports of the efficacy of regional anesthesia and analgesic techniques. In 1990, the American Pain Society developed draft standards for quality assurance for relief of acute pain. In 1992, clinical guidelines on acute pain management were issued by the Agency for Health Care Policy and Research.

Postoperative pain relief has generated intense interest and fostered the introduction of several new analgesic modalities (epidural opioids, PCA infusions, and interpleural analgesia). Although these techniques have been shown to provide better pain relief than conventional intermuscular administration of opioids, the complexity of these modalities requires the use of an organized approach to maximize efficacy while minimizing potentially adverse effects. The basic goals of an acute pain service are twofold. The first is to administer and monitor postoperative analgesia and the second is to identify and manage complications or side-effects of postoperative analgesic techniques (Barash, Cullen, & Stoelting., 1993; AHCPR, 1992).

Today, there are many published reports on the evaluation and successes of chronic pain management programs, but few reports on formal acute pain management services (Warfield & Kahn, 1995). In order to improve the systematic management of patient's pain, there must be a major change in current practice. There is more than enough evidence currently in the literature to show that formal pain services improve

outcomes. It was the purpose of this research to evaluate the programs provided by the Air Force in acute pain management and to determine who is providing what types of services. The next question is: "What does the Air Force have to offer in acute pain management services?"

## CHAPTER THREE: METHODOLOGY

### Introduction

The methodology for this study consists of a telephone survey, based on the survey questions conducted by Warfield and Kahn (1995) to assess pain management services and the familiarity with the AHCPR guidelines in anesthesia departments in the Air Force. This survey was conducted by the principal investigator. All Air Force medical facilities with an anesthesia department and operating room services were included in this research study.

### Research Design

The research design selected for this study was a descriptive survey. This research design examines the variables of interest without any manipulation by the researcher. Descriptive studies provide the basis for undertaking explanatory research (Abdellah & Levine, 1965). In many areas this has been the usual mode of progression-from a broad descriptive study that uncovers problem areas to explanatory research that investigates the possible causes of the problem.

### Population and Sampling

The target population includes all anesthesia departments in Air Force medical facilities in existence today, consisting of 81 Air Force medical facilities in the United States, the Pacific, Europe, and Central America. The list of current Air Force medical facilities addresses and telephone numbers was obtained from the 89th Medical Group's Commander's Office at Malcolm Grow Medical Center, Andrews AFB, MD. in December, 1996. This was correlated with the special issue on U.S. military installations

published by the Air Force Times (1996). The telephone questionnaire was conducted by the principal investigator. The survey questions were directed to the anesthesia department, and/or the individual who is in charge of the pain management program for the hospital. If there was no such person, the investigator asked to speak with the person in charge of the anesthesia services.

Two weeks prior to conducting the survey, the questionnaire was mailed to all Air Force medical facilities, in order to promote familiarity with the topic and ease of answering the descriptive data at the time of the telephone survey.

#### Instrumentation

The instrument used in this study consists of 25 survey questions related to acute pain management services (See Appendix A). These questions were previously used in the article, "Acute Pain Management: Programs in U.S. hospitals and experiences and attitudes among U.S. adults," published by Warfield and Kahn (1995). After a written request to Dr. Warfield, the telephone questions were mailed to this principal investigator to be used in this descriptive study. A written letter was sent to Mr. Rob Roy, from Total Research Corporation, an independent research firm, to secure permission to use the survey tool in this study.

Seven key areas that this survey focuses on include: (a), Prevalence and type of program, (b), Program initiation and duration, (c), Primary goals of program, (d), Services and components, (e), Staff involved in APMS, (f), Familiarity with the AHCPMR guidelines, and (g), Barriers that prohibit implementation of an APMS.

## Validity

Content validity, is relevant to individuals designing a tool that focuses on measuring a specific content area. The validity of this survey tool was not completed by the original creator of the instrument. Prior to data collection, permission to use the survey tool was secured from the creator and a content validity index was determined. Several questions were added to the survey related to barriers in initiating/improving the APMS in Air Force medical facilities.

This revised instrument was tested for content validity, item construction, and test format by two experts in the field of pain management. To be considered an expert in this topic, the individual had to be currently practicing anesthesia and was familiar with pain management practices through advanced education or clinical experience in that field. One of the experts was an anesthesiologist who is involved with the management of pain patients in an Air Force medical center in southern Maryland. The other expert is an Associate Professor of Anesthesiology, and manages the acute pain management services at a large, teaching facility in Baltimore, MD. A content validity index was calculated.

The 25 survey questions were mailed to each of the experts, who were asked to rate the validity of the survey questions to the purpose of the study, on a scale of one (not valid) to four (most valid). The average score of "3" was obtained for questions numbered 4, 5, 6, 7, and 19. The remaining questions were scored as "4".

The content validity index was calculated as follows:

$$CVI = \text{Number of items rated as a 3 or 4 by both raters} \div \text{Total number of items}$$

The calculated content validity index showed a score of  $25/25 = 1.00$ . This instrument had the highest content validity index score possible.

### Reliability

Reliability is defined as the degree to which an instrument consistently measures characteristics in which it is designed to measure. The telephone questionnaire was tested in a pilot sample of 10 Air Force facilities in the U.S., ranging from 10 beds to a 250-bed facility. The time to complete the pilot survey ranged from 18 minutes to 55 minutes to complete, with an average time of 22 minutes. One base refused to consent to the survey and was dropped from the study. Two to five weeks later, the remaining nine providers were contacted and retested with the same tool. Reliability was consistently found to be 100% with all questions, except for numbers 11 and 14, (60% retest reliability), which required providers to answer the questions with estimated percentages. When questions numbered 11 and 14 are included, the total percent agreement between time one and time two equalled 94 variables out of a possible 107 variables. This resulted in a 87% reliability rate for all the variables. Because of the low reliability, these questions were excluded from the discussion.

### Ethical Considerations

Prior to collecting the data, written permission to conduct the investigation was obtained from the Institutional Review Board at the Uniformed Services University of the Health Sciences in Bethesda, Maryland. Permission from the Air Force Personnel Survey Program based on Air Force Instruction 36-2601 (1 Feb 1996), was also secured for authorization to conduct the study in each Air Force medical facility.

Participation in this study was voluntary, and participants were free to withdraw at any time if they desired. Participants were required to give consent to voluntarily participate in this study, prior to beginning the survey (See Appendix C). There were no treatments or manipulations of the participants. No invasive, harmful effects to the subjects were involved in this study.

Telephone questionnaires were numerically coded at the top of the survey, rather than listing the name of the institution on the form, in order to treat obtained data with anonymity and confidentiality. Results were offered to all participants and made available to those institutions expressing a desire of the study's results.

#### Data Collection

The purpose of the study and instructions for completion of the telephone survey were explained thoroughly to participants by this principal investigator. Data was collected in the research department board room at the Graduate School of Nursing offices using Autovon phone lines to reach the anesthesia departments of each facility. The survey was scheduled to take approximately 20-30 minutes to complete. Attempts were made to contact appropriate participants on three to five occasions, and then the institution was excluded from the study.

Descriptive statistical analysis were performed using the Statistical Package for the Social Sciences (SPSS) computer program. Similar to the survey by Warfield and Kahn (1995), the data were analyzed looking at frequencies and means, and compared to U.S. hospitals. Chi-square analysis was used to compare the two groups.

### Summary

Results of the survey were compiled to assess the status of acute pain management services, prevalence of programs, initiation and duration, primary goals, services and components, staffing, and awareness of AHCPR guidelines in the Air Force, as compared to the hospitals interviewed in the study by Warfield & Kahn. Additional questions that were asked in this survey relate to the amount of ambulatory or same day surgeries in Air Force hospitals.

## CHAPTER FOUR: ANALYSIS OF DATA

### Introduction

This chapter presents the results of the survey and the significant characteristics that were pertinent to the study. Variations in the descriptive data and statistical results are also provided in tables in this chapter. Throughout this chapter, comparisons will be made with the results found in Warfield's survey.

### Characteristics of the Sample

The population originally consisted of 81 Air Force medical facilities throughout the world. This population included facilities with anesthesia departments and operational surgical services in the continental United States (CONUS), Europe (USAFE), and the Pacific (PACAF). However, only 55 of those respondents met all the criteria for eligibility in the study. The other 26 bases were excluded because they had no anesthesia department or operating services. Five of the 55 bases were dropped from the study. Five bases refused to participate for several reasons. Two bases responded to the pre-survey questions, but refused telephone consent to participate. One base refused participation when telephone contact was initiated, and stated that the facility was 'command-directed' not to participate in telephone surveys. Another base refused to participate since they were closing in July 1997. One base was dropped from the survey, because it was scheduled to open an Operating Room and Anesthesia Department in July 1997. In summary, there was a 90% response rate of the 55 eligible facilities.

### Bed Size

Distribution of hospitals by bed size is shown in Table 1:

**Table 1. Number of Hospitals in the Study by Bed Size**

| <b>Number of Beds</b> | <b>Number of Hospitals</b> | <b>Percent of Hospitals</b> |
|-----------------------|----------------------------|-----------------------------|
| <b>Total</b>          | 50                         | 100                         |
| <b>0-10</b>           | 16                         | 31                          |
| <b>11-39</b>          | 19                         | 38                          |
| <b>40-75</b>          | 6                          | 12                          |
| <b>76-100</b>         | 3                          | 6                           |
| <b>101-200</b>        | 3                          | 6                           |
| <b>201-390</b>        | 3                          | 6                           |

Air Force bases inside the United States or CONUS accounted for 82%, USAFE contained 8%, PACAFE contained 6%, and 4% of the respondents were caring for patients both in CONUS and USAFE. One of the bases was located in the U.S. and the other in Great Britain.

The 50 respondents were split equally between CRNAs and anesthesiologists. In Air Force hospitals, only 12% were associated with universities or some type of teaching program, while 88% had no residency program. In Warfield's survey, all respondents were anesthesiologists or physicians in charge of the pain management program, and the sample size consisted of 100 teaching hospitals and 200 non-teaching hospitals.

Interestingly, same day surgeries at Air Force hospitals ranged from 50% to 100%. Five of the hospitals reported that 100% of their surgeries are outpatient surgeries. Twenty-one of the hospitals stated that 70-89% of their total amount of surgeries performed are same day patients. Eleven facilities reported that more than half of their surgeries are outpatients.

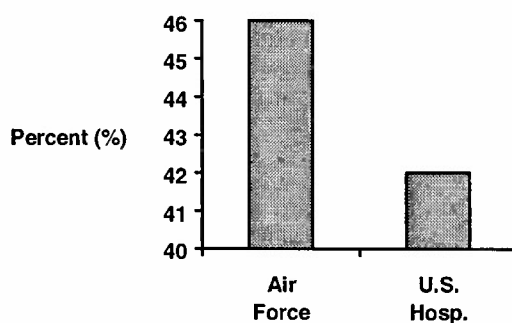
### Prevalence and Types of Programs

Nearly half of the 50 hospitals have formal pain programs. An additional 12 % had plans to establish an acute pain management program in the future. A little more than a third reported that they had established a formal pain management program or service with written guidelines, policies, or procedures to manage patient's pain.

Of the 50 hospitals surveyed, 94% reported that acute postoperative pain management was a component of the program. Sixty-eight percent of programs included chronic pain management, 24% included cancer pain management, and 62% included the management of acute pain not related to surgery. Larger hospitals with teaching components reported more pain management programs than did smaller facilities. This may be due to more available staffing at larger hospitals.

Chi-square analysis and Pearson coefficients were calculated using the SPSS program. In comparison to U.S. hospitals, Air Force facilities were found to have no statistically significant difference in the proportion of formal pain programs established. The p value was 0.98398.

**Figure 3: Percentage of Hospitals with APMS**



### Program Initiation and Duration

The results showed that 90% of the hospital's acute postoperative pain management programs were created in the last 5-9 years, 25% were created in the last two years, and 10% were created in the last year. Of the sampled anesthesia providers, 76% believe that the trend in pain management consultation is increasing, 20% believe it's staying about the same, and 4% believe the trend in pain consultation is decreasing. Warfield's survey compares as follows:

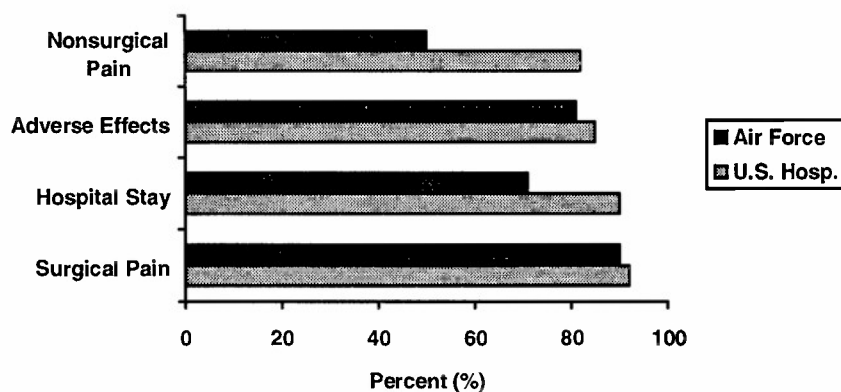
**Table 2: Comparison of Program Initiation and Duration**

| <b>APMS Initiation</b>              | <b>Air Force (%)</b> | <b>U.S. Hospitals (%)</b> |
|-------------------------------------|----------------------|---------------------------|
| <b>APMS Created in Last 5 Years</b> | 90                   | 67                        |
| <b>APMS Created in Last 2 Years</b> | 25                   | 31                        |
| <b>APMS Created in Last Year</b>    | 10                   | 17                        |

### Primary Goals

Respondents were given the opportunity to select one or more items as primary goals of their pain management programs. Controlling postoperative pain was cited as a primary goal by 90% of respondents. Reducing the length of hospitals stays was considered another primary goal by 71% of respondents. Other goals cited included reducing adverse postoperative effects of pain reported by 81% of respondents, and controlling nonsurgical acute pain reported by 50% of respondents. In Warfield's survey, controlling postoperative pain was a primary goal by 92% of respondents.

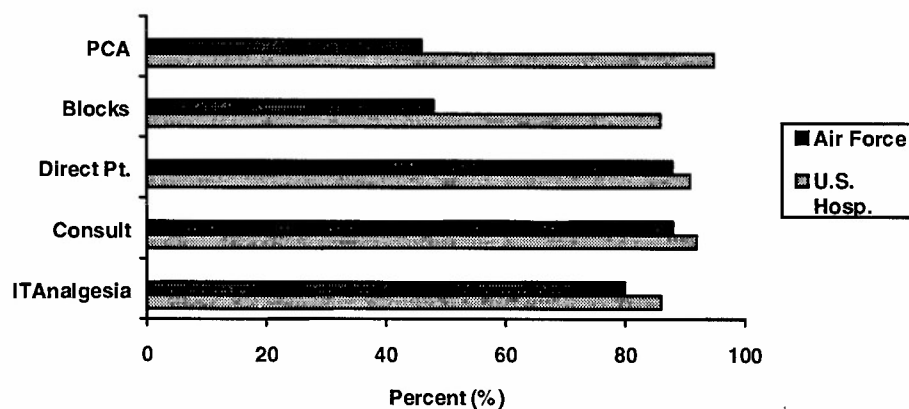
**Figure 4: Primary Goals of Hospital's APMS**



#### Services and Components

The anesthesia services of the acute pain management programs surveyed included: 46% managed patient-controlled analgesia, 88% provided consultation, 82% provided direct patient pain management, 48% provided continuous nerve block techniques, and 80% provided intraspinal opioids. In Warfield and Kahn's survey (1995), the services of the APMS included: 95% PCA, 92% consultation, 91% direct patient management, 86% nerve blocks, and 86% intraspinal opioids.

**Figure 5: Services Provided through the APMS**



There was a statistically significant difference between U.S. hospitals and Air Force hospitals in terms of services provided through the APMS. See table below.

**Table 3: Comparison of Statistical Significance of APMS Services**

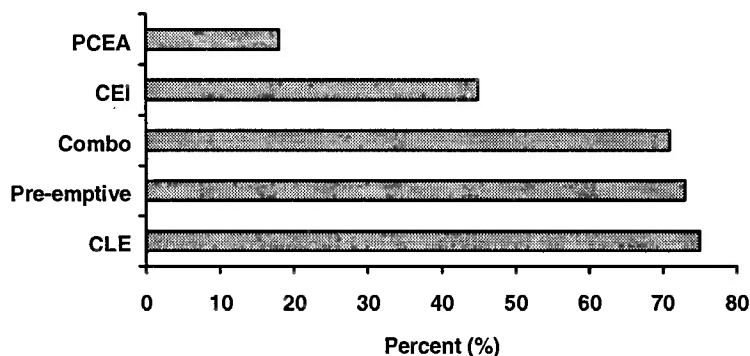
| Variable                                   | Air Force | U.S. Hosp. | p value |
|--------------------------------------------|-----------|------------|---------|
|                                            | Percent   | Percent    |         |
| <b>Services Provided through APMS: PCA</b> | 46        | 95         | 0.00000 |
| <b>Blocks</b>                              | 48        | 86         | 0.00000 |
| <b>Direct Patient Care</b>                 | 82        | 91         | 0.07726 |
| <b>Consultation</b>                        | 88        | 92         | 0.38877 |
| <b>Intrathecal Analgesia</b>               | 80        | 86         | 0.33888 |

One question surveyed hospital-wide services for acute pain management that involved other disciplines. For this question, 84% offered PCA's or were in the process of procuring PCA's for surgical patient's use. Most of the respondents (90%) offered epidural opiates for acute postoperative pain. Twenty-five facilities (51%) used continuous local anesthetic infusions, primarily for labor patients. Twenty-eight hospitals (57%) commonly used TENS (transcutaneous electrical nerve stimulator) units for acute pain.

In reference to epidural opiates, 18% used patient-controlled epidural analgesics, in rare instances. Forty-five percent used continuous epidural infusions, and 75% used continuous epidural infusions for labor patients. Seventy-one percent of the respondents use combined spinal-epidural techniques in their anesthesia practice, and 73% use pre-

emptive epidural analgesia for acute pain management in Air Force facilities.

**Figure 6: APMS Usage in the AF in Reference to Epidural Opiates**



Of the 46% of hospitals that currently have or are planning an acute pain management program, components of the program included the following: 78% had written guidelines, 80% had quality assurance measures, 78% had on-call personnel, 63% had standards for prescribing postoperative pain management, 71% had continuing medical education for professionals, 61% had written goals and objectives for postoperative pain management, 67% had a pain assessment sheet or tool, 52% had a list of available pain management medications and non-drug treatments with guidelines for their use, and 35% had a list of procedures requiring postoperative pain management. The Air Force results showed lower percentages as compared with Warfield's survey. Fewer Air Force facilities' programs had written guidelines, goals, standards, continuing medical education for professionals and quality assurance measures than those hospitals surveyed in the U.S.

Differences between all Air Force and U.S. hospitals APMS components were statistically significant (at p value of 0.05 level) The table below best sums these numbers.

Figure 7: Components of APMS

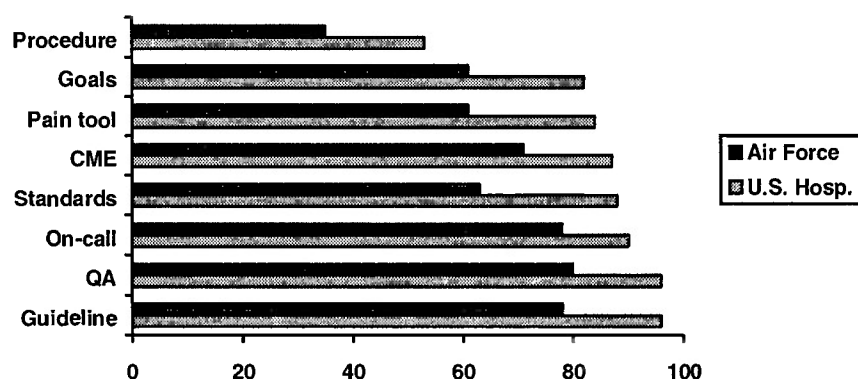


Table 4: Comparison of Statistical Significance of APMS Components

| Variable:                            | Air Force | U.S. Hospital | p value |
|--------------------------------------|-----------|---------------|---------|
|                                      | Percent   | Percent       |         |
| APMS Components: Procedures          | 35        | 53            | 0.02857 |
| Written Guidelines                   | 78        | 96            | 0.00007 |
| QA Measures                          | 80        | 90            | 0.00025 |
| On-call Personnel                    | 78        | 90            | 0.03221 |
| Standards for Prescribing Management | 63        | 88            | 0.00009 |
| CME                                  | 71        | 87            | 0.01343 |
| Pain Tool                            | 61        | 84            | 0.01162 |
| Goals and Objectives                 | 61        | 82            | 0.00223 |

One of the questions, number 14 was the most problematic and had the least amount of reliability during the test-retest pilot study. This question asked providers to breakdown the percentages of acute postoperative pain management services utilized by

specialty service. The results showed that of the 23 facilities with formal programs: a range of 50 % - 80 % usage was in obstetrics, a range of 5 % - 30 % usage was in orthopedics, a range of 5 % - 20 % was in gynecology, a range of 10 % - 20 % usage in thoracic cases, a range of 10% in neurology and ENT cases, and a range of 5 % -10 % in urology patients.

### Staff

According to survey respondents, 61% of the hospital's acute pain management services were headed by anesthesiologists, 32% were headed by CRNA's, and 7% were headed by another physician. Sixty-two percent reported anesthesiologists and 75% reported CRNA's as a member of the APMS team. Other professionals likely to be involved in pain management included: nurses (52%), pharmacists (16%), and surgeons (59%).

### Pain Counseling

Nearly all 50 hospitals (94 %) surveyed provided counseling for patients regarding acute pain management. The following professionals were involved in patient counseling about acute pain management: 70% anesthesiologists, 89% CRNA's, 72% surgeons, 54% RN's, and 2% pharmacists.

For patients who were undergoing an operation, 77% were counseled a few days before hospitalization, 44% were counseled the day before surgery, 56% were counseled on the day of surgery, 30% were counseled immediately following surgery, 4% were counseled on the day following surgery, and 2% were counseled some other time.

**Figure 8: Pain Counseling**

Air Force

U.S. Hospitals



### Pain Measurement Tools

One of the survey questions asked respondents to identify the type of tools used for pain management. 86% reported to use a verbal numerical rating scale for pain assessment, 33% used a visual analog scale, and 12% used adjective rating scale. Eight percent used another tool, such as the Magill Pain Questionnaire (MPQ-SF), in addition to the other scales. In Air Force medical facilities, 47% said that control of patient's pain is part of the hospital's quality assurance program. Warfield's survey compares with the Air Force results as follows:

**Table 5: Percentage of Pain Measurement Tools used in AF and U.S. Hospitals**

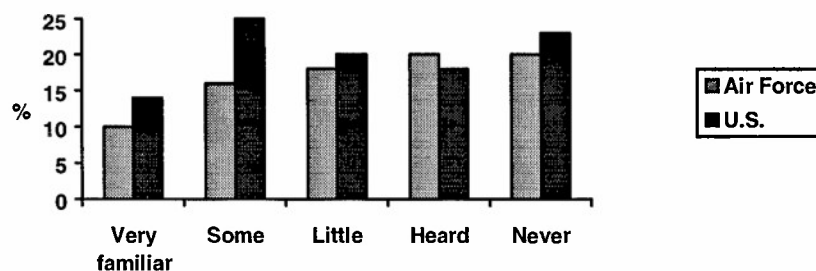
| Pain Measurement Tools        | Air Force (%) | U.S. Hospitals (%) |
|-------------------------------|---------------|--------------------|
| Verbal Numerical Rating Scale | 86            | 78                 |
| Visual Analog Scale           | 33            | 41                 |
| Adjective Rating Scale        | 12            | 31                 |

### AHCPR Guidelines

Ten percent of the survey respondents were very familiar with the AHCPR clinical practice guidelines on acute pain management, and 22% reported that they had a copy of the guidelines. Sixteen percent were somewhat familiar with the guidelines, 18%

were only slightly familiar, and only 20% had only heard of the guidelines. Thirty-six percent had never heard of the guidelines. Sixteen percent of the anesthesia providers who were familiar with the guidelines reported that it had influenced their hospital's pain management program. An additional 12% expected the guidelines to influence their pain management program in the future. Finally, 14% believe the guidelines will not influence their pain management program at all.

**Figure 9: Familiarity with AHCPR Guidelines**



#### Role of CRNA's in the APMS

At all 50 bases surveyed, CRNAs were members of the anesthesia department, and in some bases, in charge of the anesthesia department. Sixty-six percent of the nurse anesthetists were performing consultations in pain management, 86% were involved in direct patient management, 50% were involved in management of postoperative patient-controlled analgesia, 44% were performing continuous nerve block techniques, and 88% were managing intraspinal opiates.

#### Barriers to Implementing an APMS

Of the 50 bases surveyed, 30% felt that cost was a barrier to initiating an APMS in their facility. Others responded that it was the staffing of the anesthesia departments

from 62% of respondents, size of the facility from 62%, amount of surgical cases from 51%, reluctance in other departments from 17%, or staffing in other departments from 30%, that created a barrier to creating and continuing an APMS in their facility.

**Table 6. Barriers to Implementing an APMS**

| <b>Barrier</b>                      | <b>Percent of Air Force Hospitals<br/>Reporting Barrier</b> |
|-------------------------------------|-------------------------------------------------------------|
| <b>Staffing of Anesthesia Dept.</b> | 62                                                          |
| <b>Size of the Facility</b>         | 62                                                          |
| <b>Amount of Surgical Cases</b>     | 51                                                          |
| <b>Cost</b>                         | 30                                                          |
| <b>Staffing in Other Depts.</b>     | 30                                                          |
| <b>Reluctance in Other Depts.</b>   | 17                                                          |

#### Chi-square Results

The following table summarizes the statistical significance of variables comparing USAF with U.S. hospitals. There was not a statistically significant difference between Air Force hospitals and U.S. hospitals who utilized an acute pain service. There was a significant difference in the percentage of pain counseling provided and prioritizing goals for managing acute pain between Air Force facilities and U.S. hospitals.

**Table 7: Statistical Significance of Variables Comparing AF and U.S. Hospitals**

| <b>Variable</b>                                | <b>Air Force</b> | <b>U.S. hospital</b> | <b>p value</b> |
|------------------------------------------------|------------------|----------------------|----------------|
|                                                | <b>Percent</b>   | <b>Percent</b>       |                |
| <b>Percentage of Hospitals with APMS</b>       | 45               | 42                   | 0.98398        |
| <b>Pain Counseling for Patients</b>            | 94               | 57                   | 0.00001        |
| <b>Primary Goals of APMS: Nonsurgical Pain</b> | 50               | 82                   | 0.00001        |
| <b>Reducing Adverse Effects of Pain</b>        | 81               | 85                   | 0.54910        |
| <b>Reducing Length of Hospital Stay</b>        | 71               | 90                   | 0.00064        |
| <b>Controlling Surgical Pain</b>               | 90               | 92                   | 0.57795        |

### Summary

The descriptive research questions posed in chapter one have been answered in this study. It was found that 46% of Air Force hospitals have formal pain management services, which began as early as 1988 to the present. The types and services and components offered by the anesthesia departments are similar to that found in the Warfield study, including regional anesthetic and opioid techniques, along with patient counseling on acute pain. It was found that both CRNA's and anesthesiologists in Air Force facilities manage and lead various forms of acute pain management programs. The major barriers to implementing an APMS included: staffing of the anesthesia department, size of the facility, and amount of surgical cases. The current trend in pain management consultation, both in the Air Force and in the U.S. hospitals, is increasing in numbers. There seemed to be a more significant lack of familiarity with the AHCPR guidelines in the Air Force as

compared to the U.S. hospitals studied by Warfield and Kahn (1995). But, overall, Air Force hospitals compared favorably with U.S. hospitals in terms of services, pain counseling, and the number of established programs today.

## CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

### Content Discussion

The purpose of this study was to examine the prevalence of acute pain management services (APMS) in Air Force medical facilities and survey each institution for its initiation of an APMS, goals, services and components, staffing, and familiarity with the Agency for Health Care Policy and Research (AHCPR, 1992) guidelines in acute pain management, similar to questions that were used in the survey by Warfield and Kahn. In addition, new questions were asked regarding barriers to implementing an APMS, percentage of same day surgeries, and the roles and responsibilities of CRNA's in Air Force facilities.

The survey indicates that formal pain management programs are becoming more prevalent in the Air Force hospitals, with 45 % having active programs to manage acute pain and additional 12% planning to implement such programs. The respondents included hospitals in England, Germany, Turkey, Korea, and Japan, who also established acute pain programs to meet the needs of patients in overseas countries. In Warfield and Kahn's survey (1995), 42% of the hospitals surveyed had acute pain management programs and an additional 13% had plans to establish an APMS. The Air Force has certainly kept up with current trends, worldwide, along with the establishment of formal acute pain services that has occurred in U.S. hospitals over the past five years.

It is interesting to note that the responses from Air Force facilities are remarkably similar to the results found by Warfield and Kahn (1995). Their survey used a sample size of 300 hospitals that included residency programs, teaching hospitals and community

hospitals with various bed sizes. In many of the categorized questions, the results from the smaller Air Force facilities were surprisingly similar to the results found in Warfield and Kahn's survey of the larger U.S. hospitals.

A majority of hospital participants (76%) noted a trend toward more aggressive pain management. This attitude is supported by the fact that most of the acute pain management programs were established during the past 5-9 years.

The goals and services of acute pain management programs mentioned by survey suggest that anesthesia providers are recognizing that adequate pain control can improve patient comfort, speed recovery and contain health-care costs. One of the questions on APMS goals was found to be statistically significant in reference to reducing hospital stay of patients, and controlling patients' nonsurgical pain. Air Force hospitals had lower percentages in both categories (see Table 8 in Chapter 4) which may be related to the fact that patient length of stay is not a cost-benefit issue for Air Force hospitals. Secondly, nonsurgical pain may not be a high priority when it does not present itself in large numbers in Air Force hospitals due to a predominantly healthy, active, fit military population. The question on pain counseling found 94% of all Air Force hospitals surveyed, including those without formal pain management programs, have programs to discuss acute pain management with patients. This was found to be statistically significant with a p value of 0.0001. The actual cost of running an APMS was not asked in this survey, but, should be considered in future studies.

Anesthesiologists and anesthesiologists headed pain management programs in 93% of the hospitals surveyed. An anesthesia provider was a member of the pain management

team in more than 75% of the programs. These results indicate the importance and presence of anesthesia providers in pain management. It is thought that this is due to their interest in the management and understanding of pain, expertise in regional blockade, and knowledge of the pharmacology of analgesics. Other professionals most likely to be involved in pain management included nurses, pharmacists, and surgeons, suggesting the value of the collaborative, interdisciplinary team approach to pain control.

Only a minority (26%) of the hospital respondents said they were familiar with the guidelines (AHCPR, 1992), fewer than a quarter reported having a copy of the guidelines in their hospital, and only 16% said it had influenced their pain management programs. In Warfield and Kahn's survey (1995), 77% of hospital's were familiar with the guidelines and 19% reported it had influenced their programs. The results indicate, that overall awareness of the AHCPR recommendations is low, and the knowledge may be lacking. The guidelines appear to have influenced only a small percentage of hospital pain management programs.

Despite clear trends toward an increased awareness of the need for pain management and the establishment of pain management programs, more than half of the Air Force medical facilities have yet to establish such programs, and fewer respondents have been influenced by the AHCPR guidelines that advocate a formal, institutional approach to the management of acute pain. Future studies could determine who and what influenced the initiation of an APMS. The AHCPR guidelines are not as well known as say, the conceptual model by Bonica (1974).

There is a growing trend in Air Force facilities in the numbers of same day

surgeries being performed. Five hospitals (12%) reported that all of their surgeries are same day. No Air Force hospital reported less than 50% of their monthly cases to be same day surgeries. Anecdotally, many of the anesthesia department chiefs with 90-100% ambulatory outpatients, reported that acute postoperative pain was not an issue and there was no need for formalized programs. They did state that to reduce the incidence and severity of acute postoperative pain, increased awareness of the shortened hospital stay and appropriate short-acting pharmacologic agents including analgesics in outpatients were considered. One respondent mentioned as an aside that a patient's postoperative pain needs were met because "they asked the surgeon to inject 'marcaine' into the incision prior to closure". This is an area where mechanisms need to be in place to evaluate and measure the quality and adequacy of postoperative pain after a patient has been discharged less than 24 hours after a surgical procedure.

This study, as well as the previous survey conducted by Warfield and Kahn (1995) has pointed out that less than half of the medical facilities have established formal acute pain management programs today. It has been suggested in the literature and previous studies have shown that adequate pain control is beneficial to the patient's physiological response to surgery, leads to earlier mobilization, less complications, shorter hospital stay and reduced costs. It is the responsibility of anesthesia personnel to provide amnesia, anesthesia, and analgesia to our patients, since they are best suited to control pain through such formal mechanisms. If 45% of the Air Force anesthesia departments can overcome barriers to activate an acute pain service, then the remaining 55% should be able to work out the wrinkles to establish functional programs as well.

### Recommendations

Future research replicating this study should expand upon the information obtained in this survey, and include more-open ended questions of a qualitative nature. Such a study should include more information on outcomes of implementing an acute pain management service and patient attitudes and satisfaction towards currently prescribed pain control methods.

Specifically, this research should explore programs in all branches of the armed forces. As Warfield and Kahn pointed out, information on the status of acute pain management in U.S. hospitals and attitudes of adults in the U.S. towards postoperative pain management has not been previously available. Future studies can explore this research question: Do hospitals without a formal acute pain management program have less satisfied patients/customers, more postoperative pain complaints, and longer hospital stays and increased costs?

Future studies should consider obtaining the data entirely from a mailed questionnaire instead of a telephone survey. This research was conducted by telephone survey because the Warfield study used the same data collection approach. Limitations of the telephone is possible reduction in the quality of the data obtained. Attempts to contact anesthesia personnel sometimes conflicted with direct patient care. On a few occasions, the interviewee completed the telephone survey, "in between cases", because no other time was feasible for that provider. In more than a few cases, the overseas phone lines were difficult to connect, and inadvertant disconnects occurred. To eliminate this problem, the telephone surveys were mailed to all eligible anesthesia departments prior to

data collection. One facility refused to answer the questions over the telephone, preferring to respond in writing because of the lack of time in his work day. Overall, the anesthesia providers who responded were willing to participate and were interested in the results of this survey.

To conclude, anesthesia providers should be empowered to reduce the incidence and severity of postoperative pain. They should take a leading role in increasing awareness of alleviating postoperative pain by educating their colleagues and customers. Only then can the benefits of creating and utilizing an acute pain service be seen.

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## APPENDICES

## APPENDIX A

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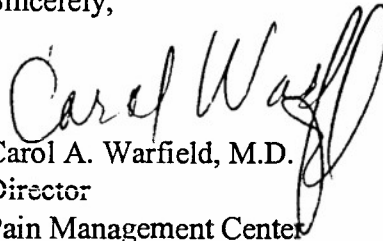
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Rockville, Md. 2085202324

Dear Tobias Wechsler,

I am writing to you to secure copyright permission to use references and results from the article by Dr. Carol Warfield, entitled, "Acute Pain Management: Programs in U.S. hospitals and Experiences and attitudes among U.S. adults. It was published in the Nov. 1995 issue of Anesthesiology, Volume 83, No. 5, Nov. 1995, pages 1090-1094.

I will be publishing a research thesis, using the results from Dr. Warfield's study in the journal, Military Medicine.

As discussed on the telephone, I am faxing you this request letter as well as a letter from Dr. Warfield granting me permission to use her results in my article. I would like you to please send me a fax with copyright permission to Fax # 301-295-2228, as well as sending me a hardcopy to the above listed address. Thank you for your speedy assistance.

Sincerely,

  
Capt. Carol L. Rayos

\* for all original data \*

PERMISSION is granted subject to your research confirming that the material in question is original to our text. Permission is granted on a non-exclusive, one-time only or life of an edition basis, with distribution rights in the English language throughout the world. The permission is subject to author approval and use of a standard credit line on the same page where our text or illustration will appear.



Date:

9/12/97

Tobias A. Wechsler, Assistant, Permissions, Lippincott-Raven Publishers.  
227 E. Washington Square, Philadelphia, PA 19106-3780

## APPENDIX C

### Content Validity Expert Letter

08 December 1996

Carol L. Rayos  
11814 Timber Lane  
Rockville, Maryland 20852  
(301) 816 -3270

Dear Dr. Tarentino,

Thank you for agreeing to give me your input on a research questionnaire on acute pain programs. I am currently a Student Registered Nurse Anesthetist at the Uniformed Services University of the Health Sciences. In my graduate studies, I must complete a research thesis and am in the process of finishing a research proposal on acute pain services in the Air Force. I am using a survey from Dr. Carol A. Warfield, who published an article on acute pain programs in the November 1995 issue of Anesthesiology. She has provided me with the survey questions, which I have modified to use in my research on Air Force facilities.

Before I can use this revised questionnaire, I must have two experts in the field of anesthesiology and pain management to critique the questions on its content validity and item construction. I would be most grateful for your input on ranking the 25 survey questions. On a scale of one to four, is the question, 1) not valid, 2) less valid, 3) somewhat valid, or 4) most valid for a study on acute pain services.

I have enclosed a self-addressed, stamped envelope and would appreciate any other comments related to the survey tool. Thank you again for your assistance in my graduate studies!

Sincerely,

Carol L. Rayos, Capt, USAF, NC

Please read the attached questions and rate the following questions for content validity on acute pain management services.

Question

Please circle one of the following:

- |     |               |                |                    |                |
|-----|---------------|----------------|--------------------|----------------|
| 1.  | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 2.  | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 3.  | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 4.  | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 5.  | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 6.  | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 7.  | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 8.  | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 9.  | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 10. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 11. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 12. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 13. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 14. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 15. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 16. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 17. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 18. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 19. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 20. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 21. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 22. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 23. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 24. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |
| 25. | (1) not valid | (2) less valid | (3) somewhat valid | (4) most valid |

I have reviewed your Acute Pain Management Services (APMS) Questionnaire and enclosed is my assessment of the content validity and item construction for each question.

Date \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

## APPENDIX D

### USAF Survey Control Number Letter



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR FORCE PERSONNEL CENTER  
RANDOLPH AIR FORCE BASE TEXAS

14 March 1997

MEMORANDUM FOR CAPTAIN CAROL L. RAYOS

FROM: HQ AFPC/DPSAS  
550 C Street West, Suite 35  
Randolph AFB TX 78150-4737

SUBJECT: Survey Approval and Assignment of USAF Survey Control Number

Your proposed survey has been reviewed to ensure it is in accordance with AFI 36-2601. I am approving your survey for use with Air Force members. Your approval number is: USAF SCN 96-100.

Please ensure that the USAF SCN appears on the consent form. The USAF SCN number will expire on 30 June 1997. Additionally, it is important that you understand that your survey results may be requested by the public under the provisions of the Freedom of Information Act (FOIA).

Best of luck with your data collection and if this office can be of any further assistance please do not hesitate to contact me via phone (COM (210) 652-5680 or DSN 487-5680) or via e-mail (bensonm@hq.afpc.af.mil).

A handwritten signature in black ink, appearing to read "Michael J. Benson", is located below the text.

MICHAEL J. BENSON, Lieutenant, USAF  
Personnel Survey Analyst

## APPENDIX E

USUHS IRB Approval Letter



UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

4301 JONES BRIDGE ROAD  
BETHESDA, MARYLAND 20814-4799



February 4, 1997

MEMORANDUM FOR CAROL L. RAYOS, CAPTAIN, USAF, NC, GRADUATE  
SCHOOL OF NURSING

SUBJECT: Human Subject Use Exemption for Protocol N06121-01

The nursing student protocol entitled "*Acute Pain Management Services: What does the Air Force Have to Offer?*" is exempt from human subject use review under the provisions of 32 CFR 219.101 (b)(2). The USUHS Institutional Review Board accepts the 3 January 1997 approval from Michael J. Benson, Lt, Personnel Survey Analyst, HQ AFPC/DPSAS for permission to conduct this telephone survey (approval number USAF SCN 96-100) to assess the status of acute pain management programs in the Air Force. The IRB understands that the nonsensitive data that is collected will not be recorded with identifiers of any type. This is a retrospective study involving a medical records review in which identifiers will not be recorded with data, and that once the data is removed, there will be no way to trace it back to individual records.

Please notify this office of any amendments you wish to propose and of any untoward incidents which may occur in the conduct of this project. If you have any questions regarding human volunteers, please call me at 301-295-3303.

Michael J. McCreery, Ph.D.  
LTC, MS, USA  
Director, Research Programs and  
Executive Secretary, IRB

Cc:  
USUHS Graduate School of Nursing  
File



## APPENDIX F

### Cover Letter and Consent Form

Capt. Carol L. Rayos, USAF, NC  
11814 Timber Lane  
Rockville, Maryland 20852  
01 Mar 1997

MEMORANDUM FOR CHIEF, DEPT. OF ANESTHESIA SERVICES

SUBJECT: Survey on Acute Pain Management Services in the Air Force

I am writing to you about a research study that I am conducting on Acute Pain Management Services in Air Force medical facilities. I am a Student Registered Nurse Anesthetist at the Uniformed Services University of the Health Sciences in Bethesda, Md. I must complete a research thesis as part of the requirements to graduate and receive a Master's Degree.

My research is titled, "*Acute Pain Management Services(APMS): What does the Air Force have to offer?*" It consists of a survey to your facility and will be asking you, the Chief of Anesthesia, or the person in charge of the pain services, 30 questions on acute pain management. Please fill out the consent and send it back, in the stamped, self-addressed envelope. If you would like a written copy of the final study results, include that in the consent. Your participation is essential in answering questions on APMS throughout the Air Force today.

Your participation is voluntary and neither you nor your hospital will be associated with your answers in any way. This 20 minute survey is approved under survey control number USAF SCN 96-100. You can verify this control number by calling the Survey Branch at AFPC if you'd like. The number is DSN 487-5680. Thank you for your cooperation.

Carol L. Rayos, SRNA, Capt, USAF, NC  
Uniformed Services University of the Health Sciences

## Acute Pain Management Services (APMS) Questionnaire

### Consent Form

With your permission, I would like you to participate in a brief telephone survey to assess the status of acute pain management programs in the Air Force and assess the role of anesthesia providers in acute pain management programs. I am currently a senior Student Registered Nurse Anesthetist completing a research thesis at the Uniformed Services University of the Health Sciences in Bethesda, Md. Your comments are confidential and you may withdraw from the survey/study at any time without jeopardy. Neither you nor your hospital will be associated with your answers in any way. The privacy of all subjects will be protected. The telephone survey will take approximately 20 minutes of your time. It is approved under survey control number USAF SCN 96-100 by the Survey Branch at AFPC. The USUHS IRB approval number is Protocol N06121-01.

I consent to participate in your telephone survey . Yes \_\_\_\_\_ No \_\_\_\_\_

Date/time \_\_\_\_\_

Name/Base \_\_\_\_\_

Yes, I would like a copy of your results mailed to my facility at (address):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Carol L. Rayos, SRNA  
Capt, USAF, NC  
USUHS Graduate School of Nursing

APPENDIX G

Demographic Data Sheet

## Demographic Data Sheet

**1. Does your hospital currently have a residency program or is it affiliated with a university?**

a. Yes

b. No

**2. How many beds does your hospital/clinic have?**

a. less than 200 beds

1.a. 0-10

4.a. 76-100

2.a. 11-39

5.a. 101-150

3.a. 40-75

6.a. 151-199

b. 200 beds or more

1.b. 200-250

4.a. 501-750

2.b. 251-390

5.a. 751-1000

3.b. 391-500

6.a. 1001+

c. DK/NA

**3. Census regions.**

a. United States (CONUS)

b. Europe (USAFE)

c. Pacific (PACAFE)

d. Other \_\_\_\_\_

**4. The participant involved in this survey is a(n):**

a. anesthesiologist

b. certified registered nurse anesthetist

c. chief of the department

d. chief of the pain management services

e. other (write-in)

**5. How many of the following are in your department?**

a. anesthesiologists \_\_\_\_\_

b. certified registered nurse anesthetists \_\_\_\_\_

**6. What percentage of the surgeries done at your facility are same day surgeries? \_\_\_\_\_**

## APPENDIX H

### Acute Pain Management Services Questionnaire

## **Acute Pain Management Services (APMS) Questionnaire**

**1. Does your hospital have a formal pain management program or service - that is, a program with written guidelines, policies and procedures?**

- a. yes
- b. no
- c. DK (Don't know) /NA (Not applicable)

**2. I am going to read you a list of components that might be part of a pain management program. For each, please tell me whether your hospital has this component.**

- a. management of acute pain not related to surgery
- b. management of chronic pain
- c. management of cancer pain
- d. acute postoperative pain management

**3. What services are provided through the program?**

- a. consultation
- b. direct patient management
- c. patient controlled analgesia (PCA) management
- d. continuous nerve block techniques
- e. intraspinal opiates
- f. none of these

**4. In what year did your hospital start its formal acute pain management program? \_\_\_\_\_.**

**5. Does your hospital plan to establish a formal acute pain management program that will include the management of postsurgical pain?**

- a. yes
- b. no
- c. DK/NA
- d. program already exists (Skip question #6)

**6. In what year does/did your hospital plan to establish a formal acute pain management program that will include the management of postsurgical pain**

- a. 1996
- b. 1997
- c. 1998
- d. DK/NA
- e. 19\_\_\_\_
- f. program already exists

**7. For the following possible goals, please tell me whether each is, or will be, a primary goal of your hospital's pain management program.**

- a. minimizing or controlling post-surgical pain
- b. minimizing or controlling acute pain not related to surgery
- c. reducing patient adverse effects from surgery
- d. reducing patient hospital stay

**8. For each of the following items, please tell me whether it is, or will be, a component of your acute pain management program?**

- a. written guidelines
- b. written goals and objectives for post-surgical pain management
- c. a list of procedures requiring post-surgical pain management
- d. standards to follow when prescribing post-surgical pain management
- e. a list of available pain management medications and non-drug treatments with guidelines for use
- f. a pain assessment sheet or other pain measurement tool to assess a patient's level of pain
- g. continuing medical education for professionals
- h. quality assurance measures
- i. on-call personnel

**9. Which of the following positions best describes the individual who (is in charge/will be in charge) of the acute pain management team?**

- a. an anesthesiologist
- a.2. certified registered nurse anesthetist
- b. a physician with pain management as his or her primary task
- c. some other physician
- d. a pharmacist
- e. a nurse
- f. an administrator with pain management as his or her primary task
- g. some other administrator
- h. someone else
- i. DK/NA

**10. Which of the following professionals (are/will be) members of the acute pain management team?**

- a. surgeons
- b. anesthesiologists
- b.2. certified registered nurse anesthetist
- c. pharmacists
- d. nurses
- e. social workers
- f. patient representatives

**11. How many full-time equivalents (or fraction) of the following: \_\_\_\_\_ would you estimate (are/will be) devoted to pain management? Total = 100%. For example, anesthesiologists =80%, surgeons = 20%.**

- a. surgeons \_\_\_\_\_
- b. anesthesiologists \_\_\_\_\_
- c. anesthetists \_\_\_\_\_
- d. pharmacists \_\_\_\_\_
- e. nurses \_\_\_\_\_
- f. social workers \_\_\_\_\_
- g. patient representatives \_\_\_\_\_

**12. For acute pain does your hospital offer...**

- a. patient controlled analgesia
- b. epidural opiates
- c. continuous local anesthetic infusions
- d. other nerve blocks
- e. transcutaneous electrical nerve stimulation (TENS)

**13. In reference to epidural opiates, does your APMS utilize the following?**

- a. patient-controlled epidural analgesia (PCEA)
- b. continuous epidural infusions postoperatively (CEI)
- c. continuous epidural infusions for laboring patients
- d. combined spinal-epidural techniques
- e. pre-emptive epidural analgesia

**14. In your acute pain service, what is the percentage of APMS usage in these areas? Total = 100%.**

**For example, obstetrics = 50%, general surgery = 25%, and orthopedics = 25%.**

- a. gynecology
- b. general surgery
- c. thoracic
- d. urology
- e. orthopaedics
- f. obstetrics
- g. other (write-in)

**15. Do patients receive counseling on acute pain management?**

- a. yes
- b. no
- c. DK/NA

**16. Which of the following professionals are involved in patient counseling about acute pain management...**

- a. surgeons
- b. anesthesiologists
- c. pharmacists
- d. nurses
- e. social workers
- f. patient representatives
- b.2. certified registered nurse anesthetists

**17. When is a patient counseled? Is it...**

- a. a few days before hospitalization
- b. on the day of surgery
- c. on the day before surgery
- d. immediately following surgery
- e. in the days following surgery
- f. some other time
- g. DK/NA

**18. Which of the following tools do you use for pain management?**

- a. a verbal numerical rating scale
- b. a visual analog scale (VAS)
- c. an adjective rating scale
- d. other\_\_\_\_\_

**19. How familiar are you with the clinical practice guidelines, "Acute pain management: Operative or Medical Procedures and Trauma" that was issued by the United States (US) Department of Health and Human Services in 1992. Would you say you are.....**

- a. very familiar
- b. somewhat familiar
- c. only a little familiar
- d. have only heard of
- e. have never heard of the guidelines

**20. Does your hospital have a copy of the guidelines?**

- a. yes
- b. no
- c. DK/NA

**21. Have these guidelines influenced your pain management program, or do you expect them to influence your program in the future, or do you believe these guidelines will not influence your pain management program at all?**

- a. have influenced
- b. expect them to influence
- c. will not influence at all
- d. DK/NA

**22. Is control of patient pain part of your hospital's quality assurance program?**

- a. yes, part of program
- b. no, not part of program
- c. DK/NA

**23. Do you believe the trend in pain management consultation is.....**

- a. increasing
- b. staying about the same
- c. decreasing
- d. DK/NA

**24. Are the CRNA's allowed to perform....**

- a. consults
- b. direct patient management
- c. patient controlled analgesia management (PCA)
- d. continuous nerve blocks
- e. intraspinal opiates
- f. none of these

**25. What do you feel are some of the barriers to implementing an APMS in your facility?**

- a. cost
- b. reluctance in other departments
- c. size of the facility
- d. amount of surgical cases
- e. staffing of anesthesia department
- f. staffing in other departments
- g. other \_\_\_\_\_