A DESCRIPTION OF ANESTHESIA PERSONNEL CHARACTERISTICS IN UNITED STATES ARMY MEDICAL TREATMENT FACILITIES.

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ABSTRACT

In the United States Army nurse anesthetists have been the primary providers of anesthesia cases in all the wars, conflicts, and peace keeping missions. Yet little has been written about these nurses. The focus of this research study is to describe the role of the Certified Registered Nurse Anesthetist (CRNA) in surgical centers, small, medium, and large medical treatment facilities (MTF) in the United States Army. A descriptive survey tool was designed and mailed to anesthesia departments, at each United States Army MTF. Twenty eight of 33 MTFs returned the surveys; achieving an 85% return rate. The data showed three large MTFs have more anesthesiologists than CRNAs. One of the large MTFs has 18 anesthesiologists and only eight CRNAs. The ratio of anesthesiologists to CRNA for the surgical centers was 0:2 and the small and medium MTFs ratio was 1:2. The large MTFs were found to operate with a very high anesthesiologist to CRNA ratio from 1:1 to 2:1. The data did not show any increase in productivity, as measured by case per provider per year, at the facilities with the higher ratio of anesthesiologists to CRNA. The data showed cases per provider per year was less in the large MTFs compared to those with lower staffing ratios. There is much overlap between the roles of the two providers; In some places they are used interchangeably. Currently the smaller facilities have the most experienced CRNA providers and the least experienced anesthesiologists. The data also shows that the CRNAs remain on active duty in the Army longer than the anesthesiologists. This research provided base line data on the role of anesthesia providers in surgical centers, small, medium and large MTF in the US Army. The data implies that CRNAs function more independently at smaller MTFs in the Army. However, the best mix of providers warrants further investigation.

Key Words: Anesthesia, Anesthesiologists, Certified Registered Nurse Anesthetist, CRNA, Personnel Characteristic, Role, United States Army.

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THESIS

Presented to the Graduate School of Nursing Faculty of

the Uniformed Services University of the Health Sciences

In Partial Fulfillment

of the Requirements

for the Degree of

MASTER OF SCIENCE DEGREE

UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

September 1998

DEDICATION

I would like to dedicate this research project to the most important people in my life; my husband David and my sister Patricia Ann for without them I never would have begun the journey.

To my mother and Aunt Jo, I dedicate this paper and thank you for instilling within me a strong desire for knowledge and the desire to search for the truth.

ACKNOWLEDGMENTS

Sincere thanks and appreciation are extended to my committee members: Dr. Maura S. McAuliffe, Dr. Eugene Levine, and Dr. E. Jane McCarthy for their assistance, guidance, support, and patience.

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CHAPTER ONE: INTRODUCTION & FRAMEWORK OF THE STUDY

Statement of the Problem

Modern day practice of anesthesia began in 1846 when ether was used at Massachusetts General Hospital by William T. G. Morton. At the time anesthesia was not considered a prestigious practice for physicians. In fact there was a high mortality rate because no one was willing to specialize in anesthesia. Surgeons were forced to search out individuals willing to specialize in the administration of anesthesia. They found the answer to their dilemma in nursing (Gunn, 1991; Bankert, 1993). Consequently, nurses have been the primary providers of anesthesia for over 100 years. One of the first instances of nurses utilized strictly to deliver anesthesia was at the Mayo Clinic. These nurses' practices and techniques were disseminated and their training of nurses for the work of anesthesia also spread (Gunn, 1991). The role of the Certified Registered Nurse Anesthetist (CRNA) today has been well established in all 50 states and in more than 100 other countries, yet, the nurse anesthesia specialty is relatively unknown, by the general public. "Anesthesia is not something the general public thinks about very often until they have to have one" (Mannino, 1994, p.131). CRNAs have been the primary providers of anesthesia in all the wars, conflicts, and peace keeping missions in which the United States has participated. In the first world war nurse anesthetists were trained by civilian schools for military service. These Army Nurse Corps nurses were then in the Red Cross without full rank or the

pay equal to male military personnel. It was not until years later were nurses allowed to join the United States Army as second lieutenants (Bankert, 1993).

Staffing patterns in United States Army medical treatment facilities (MTFs) relative to anesthesia work load is not known (J. Sherner, Col, AN, Anesthesia Nursing Consultant Office of the Surgeon General, personal communication, April 10, 1997). For example, it is not known whether staffing patterns are similar in surgical centers or small, medium, or large MTFs or if the role of anesthesia providers is related to their military rank. In the past decade our nation's health care costs have increased to almost 15% of the gross national product. Our Medicare program has attempted to compensate for this increase by introducing specific payment rates for diagnostic related groups (DRGs) (Barbin, 1984; Healey, 1994). It is imperative that nurse anesthetists be proactive in this new cost containment marketplace.

Currently the need for CRNAs in the public sector and U.S. Army is rising. According to Levine (1994), in 1993 a shortage of 84 CRNAs existed in the Army alone. Also, according to Maree (1991) in North Carolina, a projected shortage of nurse anesthetists would be at a minimum of 3% by 1996. This 3% deficit would be accurate only if all of the graduating CRNAs trained in that state remained there to work. Another study conducted by Rosenbach, Cromwell, Pope, Butrica, and Pitcher (1991) projected the number of surgeries to increase from 2 million in 1990, to almost 8 million in 2010, and projected the need for CRNAs to increase 23% by the year 2000. Therefore, the shortage that was predicted has continued due to high attrition rates and the increasing number of surgeries being performed.

Nurse anesthetists are necessary to the United States Army to continue providing both health care and leadership for its soldiers. Thus, the role of anesthesia personnel in the United States Army must be researched and

described. There is currently a scarcity of information regarding CRNAs in the Army.

According to Abdellah and Levine (1994) “results of quantitative studies on similar topics can be conveniently synthesized, thus facilitating the accumulation of knowledge” (p. 43). This research was conducted to describe the role of personnel in Army anesthesia departments. The results of this descriptive study may assist the Army in the future planning and delivery of anesthesia care, as the data collected provide information regarding current staffing patterns of anesthesia departments in surgical centers, small, medium, and large hospitals in the Army.

Rationale and Significance of the Problem

History has taught us the momentous attributes of research and documentation. Bankert (1993) believes that one reason nurse anesthesia has thrived in the United States is because Alice Magaw, the “mother of anesthesia”, documented and published her work as early as 1899. Without Alice Magaw‘s documentation of over 14,000 cases without a death caused by the anesthesia care, nurse anesthesia may have fallen by the wayside (Bankert, 1993; Gunn 1991). In the United States nurse anesthetists have a history that is over 100 years long, much of which has been documented and published. According to Bankert (1993), The American Association of Nurse Anesthetists (AANA) sponsored two books written on the history of nurse anesthesia, Thatcher’s *History of Anesthesia, with Emphasis on the Nurse Specialist* that was published in 1953 and concentrated on events prior to that date. Another book on the history of CRNAs, Bankert’s *Watchful Care: A History of America’s Nurse Anesthetists,* published in 1993 is primarily about events after 1953. Without these two books on the history of nurse anesthesia much of the profession’s early history would easily have been lost.

Because there is little descriptive information on the personnel characteristics of the anesthesia department in the United States Army, this research will add to a slowly growing knowledge base. Torgersen and Chamings (1994) conclude that “clarification of expectations regarding CRNAs and anesthesiologists responsibilities is a fundamental step toward recognizing areas of controversy as well as areas of mutual agreement” (p. 146). Consequently, any information documenting the characteristics of the anesthesia department will be beneficial. Considering the unique role of the anesthesia department in the Army it is interesting that there is no previous research published concerning that role.

Staffing patterns and workload characteristics of anesthesia departments in surgical centers, small, medium, and large hospitals, will be presented. This information may prove useful to the Army as well as other services for future human resource development and educational planning.

Background of the Problem

Anesthesia practiced by nurses constitutes the practice of nursing (Gunn, Nicosia & Tobin, 1987). In 1970, a statement published by The American Medical Association’s Committee on nursing recognized that medicine and nursing share many overlapping functions. This fact is also well documented throughout the history of anesthesia in our court systems. One example is the case of Frank v. South. In this case the appellate court of Kentucky in 1917, decided that nurse anesthetists were practicing nursing, not medicine (Eskreis, 1985). With this in mind it becomes apparent that the roles of the nurse anesthetist and anesthesiologist are continuing to evolve. These roles must be studied in order to fully understand them. Torgersen and Chamings (1994) believe that “Clarification of expectations regarding CRNAs and anesthesiologists’ responsibilities is a fundamental step forward recognizing areas of controversy as well as areas of mutual agreement” (p. 146)

With the vast amount of anesthesia related documentation it is surprising that little information is available on the roles of nurse anesthetists and anesthesiologists. There has been no published information about these specialties in the military. With the vast amounts of base closures, personnel “right sizing”, and major health care transitions it is vital that the relative roles of various anesthesia department personnel be examined. To help military leadership make informed decisions regarding staffing in anesthesia departments.

The United States Army has a special role providing health care to soldiers. Anesthesia providers in the Army must be prepared to perform their jobs in a variety of situations, both in peace time and in war. In 1997, United States Army anesthesia departments provided anesthesia to patients in eight medical centers and over 25 community hospitals world wide (Department of U.S. Medicine, 1996). Army hospitals are predominately small except for the eight large medical centers. These hospitals provide a wide range of anesthesia care. This makes it imperative that the roles, education and staffing patterns of these departments be understood so that data based decisions about anesthesia issues can be made.

Major Research Questions

1. What are the anesthesia staffing patterns in surgical centers, small, medium and large, hospitals in the United States Army?

1a. What are the average number of CRNAs and anesthesiologists in the United States Army medical treatment facilities?

1b. How many years have these CRNAs and anesthesiologists been practicing anesthesia?

1c. What are the military ranks of these anesthesia providers?

2. On average how many cases are performed in these surgical centers, small, medium and large hospitals?

2a. What level of acuity are the patients who receive anesthesia at these hospitals?

Definitions

Anesthesiologist

Is a physician who specializes in the delivery of anesthesia. May or may not be board certified by the American Society of Anesthesiologists.

Certified Registered Nurse Anesthetists (CRNA)

Is a Registered Nurse (RN) who has advanced training in anesthesia care delivery. To become a CRNA an RN must graduate from an accredited program of Nurse Anesthesia and pass the national certification exam.

Level of Acuity (American Society of Anesthesiologists (ASA) Classifications of Physical Status)

ASA I. Healthy patient.

ASA II. Mild systemic disease, no functional limitations.

ASA III. Severe systemic disease, definite functional limitation.

ASA IV. Severe systemic disease, that is constant threat to life.

ASA V. Moribund patient not expected to survive 24 hours with or without operation.

ASA VI. A declared brain-dead patient whose organs are being harvested.

Military Rank

Lieutenant. Begins upon entry to active duty as an officer. New officers are provided with opportunities in which to acquire leadership experience and professional military knowledge.

Captain. These officers continue developing their leadership experience and professional military knowledge.

Major. Officers at this rank are assigned to positions of increasing responsibility that require the application of previously developed skills as well as expanding their overall professional development.

Lieutenant Colonel. Assignments for these officers require progressively more responsibility commensurate with demonstrated performance, ability, and potential. This requires the application of the officer's managerial expertise, leadership abilities, and overall understanding of military operations.

Colonel. At this rank an officer is expected to be utilizing their maximum technical abilities, managerial skills, and executive talents in positions of high responsibility and leadership. (Department of the Army, Pamphlet 600-3)

Teaching Hospital

Denotes hospitals where anesthesia teaching to nurse or physician anesthesia residents are conducted.

Assumptions and Limitations

Assumptions

1. Practice patterns of anesthesia delivery vary among surgical centers, small, medium, and large medical treatment facilities (MTF) in the United States Army.

Limitations

1. This study was potentially limited by the willingness of respondents to accurately complete the data collection tool in a timely manner.
2. Data were obtained from chief/senior nurse anesthetists and presents their perspective.

Framework of the Study

Introduction

Few if any can describe the roles of the personnel that make up the anesthesia department. Therefore, role theory was chosen to help describe those roles. Role theory has been applied to many research topics in education as well as clinical and medical professions.

Biddle (1979) explains role theory as a theory that preserves the humanity of human beings and yet allows examination of the problem. For example, there is a problem of most individuals not understanding the role of the personnel in the anesthesia department. Role is defined as “those behaviors characteristic of one or more persons in a context (p. 58). The concept of role will be explored in four categories: roles are behavioral, roles are performed by persons, roles are normally limited in some way by contextual specification and roles consist of behaviors that are characteristic of a set of persons and a context.

Roles are Behavioral

Behavioral roles are actions that can be observed. Such as tasks nurse anesthetists and anesthesiologists perform which can be observed. Some of these include, talking to patients, managing patients for pain control, delivering anesthesia to patients in the operating room, and the additional role anesthesia providers have as army officers. All actions that can be observed are behavioral roles (Biddle, 1979).

Roles are Performed by Persons

According to role theory, roles are performed by persons. Role theory confines its descriptions to those actions performed by people. Therefore, by studying the roles of the anesthesia personnel, this category is fulfilled. This concept of role theory is rather broad. The role can be performed by only one person or many people. There is no set limit on who can be described in any one role (Biddle, 1979). Also, there is a limitless number of roles that can be performed and described. For the purpose of this study the roles described will be limited to the personnel characteristics of anesthesia personnel in the Army.

Roles are Normally Limited by Contextual Specifications

In role theory Biddle (1979), explains roles as also limited by some contextual specification and may not represent the entire set of behaviors performed. Further, not all roles are performed 24 hours a day or even every day. Role theory explores and describes roles being exhibited by the persons studied in a specific context. By examining the roles of nurse anesthetists and anesthesiologists in Army anesthesia departments, their roles are within a specific context: within the operating rooms of surgical centers, small, medium, and large MTFs in the Army.

Roles Consist of Those Behaviors That are Characteristic

The last concept of role described by Biddle (1979) are behaviors characteristic of a set of people and a context. Accordingly, to describe the roles performed by people, they must be a characteristic of that set of people in the context studied. For example, this study focuses on the roles of the personnel in the anesthesia department. The survey instrument asked questions about their roles in the context of the anesthesia department and the Army.

Summary and Overview

In this chapter the importance and history of nurse anesthetists to anesthesia care delivery was explained. A description of role theory and how that theory is applied to this research study followed.

Despite the fact that nursing has been providing anesthesia for over 100 years, it is a profession that is relatively unknown to the citizens of the United States of America. With the “right sizing” of the United States military and current emphasis on cost containment, staffing patterns will become increasingly more important. The United States Army provides a unique environment in which to practice anesthesia. Personnel must be prepared for peace-keeping missions as well as military conflicts. The number of anesthesia providers in the military is easily obtainable, but there is no information about their roles, education, or staffing patterns (J. Sherner, Anesthesia Nursing Consultant Office of the Surgeon General, personal communication, April 10, 1997). No previous study or documentation of the Army’s anesthesia department personnel was available. To fill the gap this research study focused on the roles, education, and utilization of anesthesia providers in the Army.

To study roles using role theory one must study the facets of that role. Biddle (1979) defines facets as a set of categories that provide a tool for evaluating examples of the behavior performed. To accomplish this in this descriptive research study, a description of personnel characteristics of the

anesthesia department is given in terms of numbers and classification of providers. Also being described are the educational backgrounds of the anesthesia providers, and the number of years of experience they have both as anesthesia providers and officers. A comparison of these staffing patterns for anesthesia personnel in surgical centers, small, medium, and large MTFs in the U.S. Army was conducted.

Data obtained from this study may be of interest to the Army, CRNAs and anesthesiologists in the Army as well as other services. This information could also be of interest to the civilian sector. Further, this study may provide valuable information for future planning regarding utilization of anesthesia personnel in the military.

In the next chapter, literature relevant to the roles of anesthesia personnel their education and costs will be reviewed.

CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

This chapter will first review literature that focuses on the need for nurse anesthetists. Particular attention is made on the need for CRNAs in the

military. A review of the literature regarding the roles of the CRNA and Army officer follows.

The Need for Nurse Anesthesia

The growing shortage of CRNAs in the military has become a concern. The American Association of Nurse Anesthetists (AANA) in 1994 prepared a statement for the Senate Appropriations Committee, Department of Defense Subcommittee on this matter. Statistics compiled by the military for the year 1994 indicate a shortage of CRNAs through out all the uniformed services. Of particular interest is the fact that the Army had only 78% of required nurse anesthetists. It was also projected that by the year 1998, the Army would have 76% of the nurse anesthetists it would need. That projection has come to fruition.

Levine (1994) and Jordan (1991) also predicted a continuing shortage of nurse anesthetists. Levine (1994) found there is an annual attrition rate of about 100 CRNAs throughout the three military services. With this attrition rate, the continued shortage of CRNAs and the number of new nurse anesthetists training in the military, Levine predicted the shortage would continue in the future. Jordan (1991) attributes this shortage to the decreased number of CRNA educational programs and the decreased number of training spaces in the last two decades.

According to Rosenbach, (et al. 1991) the number of surgeries both in hospitals and in surgery centers will increase 39% by the year 2010. With this increase in the number of surgeries is a projected increase in the number of nurse anesthetists required to provide anesthesia. Therefore, the need for CRNAs will continue to grow dramatically both for the military and the civilian sectors.

Role of the Nurse Anesthetist

In the 1989 studies conducted by Lester and Thomson describe practice profiles and role perceptions of nurse anesthetists. They found that “the roles filled by this health care provider have not been identified and reported” (p. 418). Their study focuses on the perceptions of the role of the CRNA by CRNAs and anesthesiologists. Nevertheless, their statement, that the role of the CRNA has not been reported appears to be rather accurate.

Arcari (1992) describes the nurse anesthetists role during pediatric surgical cases. He states the surgeon relies on the experience of the anesthetist and that the CRNA has the knowledge and responsibility required to care for the patient. He defined the role of the nurse anesthetist as embracing the: “maximum possible knowledge of respiratory and circulatory physiology, the medications used in the acquisition of and maintenance of anesthesia, and continuous rigorous self discipline and attention to detail in the application of this knowledge and skill” (p. 53).

Another description of the nurse anesthetists role comes from Dlugose, (1996): “CRNA practice consists of constant, continual assessment, planning, action, and reevaluation of each patient’s condition in both short-term and long-term foci” (p. 566). Dlugose (1996) and Bachus (1995) assert the nurse anesthetist’s practice is independent with a large role in the health care team.

Waugaman (1994) and Foster (1994) believe that the nurse anesthetists role goes beyond the operating room. To be a professional a CRNA must reach out beyond clinical practice into the areas of leadership, research, education and training, administration and publishing.

Role of the Army Officer

According to the Department of Defense (DoD), in the 1988 publication of *The Armed Forces Officer,* the role of the officer is to organize. The publication emphasizes the officer's role can most surely be directed toward

the end purposes of organization. Other roles examined in the publication include the need for the officer to be a risk taker, to take the responsibility for decisions, and to be willing to share rewards with subordinates. These are the roles an officer must assume in order to be a skillful leader. To do this requires knowledge and an increased responsibility to duty. The publication states: “Last is the notion of acceptability; Officers are accountable for what happens to the Armed Forces, their service and the people” (p. 11). Therefore, good military officer is responsible, accountable, and has a sense of duty.

Crocker (1993) describes the role of the Army officer in the context of duty, honor, and country. The duty of the officer is to perform to the best of one’s ability. This requires an officer to complete the mission given and possibly to enter areas of personal danger and to accept the hazards of battle. An Army officer’s honor is described as integrity with the ability to determine right from wrong and to act accordingly. The role of putting one’s country before one’s self is the last role described by Crocker. He describes it as a willingness to take action or be ready to do so for the country’s freedom or rights.

The Army officer has many phases to traverse throughout their career. The officer’s development begins upon entry into service, the lieutenant phase. This phase lasts about three to four years and includes attendance to their branch officer basic course (OBC). This course provides the education necessary to begin a career as an officer. OBC training provides instruction on the overall mission and function of the officer’s branch of service. During the lieutenant phase an officer is expected to acquire an understanding of Army operations and military life, this provides their foundation for future service (Crocker, 1993; Department of the Army (DoD) Pamphlet 600-3, 1990).

The captain phase follows and lasts about three and a half to eleven years of service. During this time the officer is expected to develop practical leadership and professional knowledge. Knowledge is acquired from multiple sources including various duty and extra duty assignments as well as completion of the officer's advanced course and the Combined Arms and Services Staff School (CAS^3). With these experiences a captain develops practical leadership experience that enhances professional knowledge (Crocker, 1993; DoD Pamphlet 600-3, 1990).

Next is the major phase that runs from about the eleventh to the seventeenth year of service. These officers continue their development with assignments to positions of increasing responsibility. Some of these officers will attend the Command and General Staff College (CGSC). This course prepares these officers' to serve as commanders' and staff officers' and for their next promotion to lieutenant colonel (Crocker, 1993; DoD Pamphlet 600-3, 1990).

The lieutenant colonel is expected to continue to demonstrate potential for assuming positions of greater responsibility. Assignments can be expected to require progressively more responsibility and challenge. About 15 to 20% of these officers will attend the Army War College (AWC). This phase starts about the seventeenth year and runs until about the twenty-second year of service (Crocker, 1993; DoD Pamphlet 600-3, 1990).

The colonel phase usually begins about the twenty-second year of service. This phase lasts for the balance of the officer's career unless general officer rank is attained. A colonel in the army is expected to utilize technical, managerial, and executive skills in positions of high responsibility and leadership (Crocker, 1993; DoD Pamphlet 600-3, 1990).

As the army officer continues to advance in rank and years of service, military knowledge is also expected to grow and mature; for with increasing military knowledge comes increasing amounts of leadership responsibility.

Summary and Overview

This chapter has reviewed the current literature on the need for nurse anesthetists, their role and the role of the U.S. Army officer. The following chapter will focus on the methodology of this research study.

CHAPTER THREE: METHODOLOGY

Setting of the Study

This study was conducted as part of the requirements for a master of science degree for the Graduate School of Nursing at the Uniformed Services University of the Health Sciences (USUHS) at Bethesda, Maryland. The study population was the anesthesia departments in the United States Army. These departments are in surgical centers, small, medium, and large medical treatment facilities in the United States Army. The collection of data from the population began in September 1997. Respondents for this study were the Chief CRNA in surgical centers, small, medium, and large MTFs in the United States Army.

Data Collection Procedures

Surveys (Appendix B) accompanied by an introductory letter (Appendix A) were mailed to the Chief CRNA at each MTF in the Army. Consent from the participants was implied by return of a completed survey. The introductory letter explained the study purpose and confidentiality of the responses. Confidentiality was achieved by removing any individually identifying information from returned questionnaires. In addition, all questionnaires were separated from the envelopes, precluding matching responses to specific sites.

Instrumentation

The data collection instrument, a survey questionnaire, was developed by the author in collaboration with other researchers at the USUHS Graduate School of Nursing. It was designed to provide data about the research questions of interest. It consist of 44 questions divided in to four sections: demographics, personnel, work load, and management questions.

Research Design

The research design for this study was a descriptive survey. A questionnaire was used to collect data on the role of anesthesia care providers as providers and army officers and staffing patterns in anesthesia departments throughout the U.S. Army. Approval to use the survey was obtained from the USUHS Institutional Review Board as well as from Regional Institutional Review Boards of the Army.

Data Analysis

Analysis of the data responses for the 16 items consists of compiling the data to answer the research questions through frequency distributions and summary measures, such as means and standard deviations. Data was collected from surgical centers, small, medium, and large MTFs in the Army. Data were processed using the Statistical Package for the Social Sciences (SPSS).

Summary and Overview

This study used a questionnaire to collect data on demographic characteristics of CRNAs and anesthesiologists and their roles and practice in the Army. The questionnaire was mailed directly to each Chief CRNA in the Army with an invitational letter. A second mailing was conducted three weeks after the first. Descriptive analysis was conducted on the data obtained from question's 1-7 and 21-29. (See Appendix B)

CHAPTER FOUR: RESULTS

Introduction

In this chapter a descriptive analysis of the data collected from 28 facilities is presented. First, a general description of the data is provided. Next, the major research questions are answered. Finally, a summary of major findings is presented.

Description of Facilities

Of the 33 surveys mailed to Chief CRNAs at each United States Army medical treatment facility, 28 were returned. This represents an 84.8% return rate. These responses came from all regions in the Army including the Continental United States (CONUS) and outside the Continental United States (OCONUS).

Size of Facilities

The number of inpatient beds in the responding facilities ranged from 0 to 500 beds. Among the respondents were three free-standing surgery centers with no inpatient beds. These surgery centers were at one time Army community hospitals. However, with the “right-sizing” of the military they have been converted into outpatient clinics providing outpatient services only. Small, medium, and large MTFs were grouped according to the number of inpatient beds at the facility using natural cuts in the data, small 1 to 20 in-patient beds, medium 21 to 79, and large 80 to 500 beds. The mean number of inpatient beds for small MTFs was eight, medium 46 and large MTFs was 214 (Table 1).

Table 1

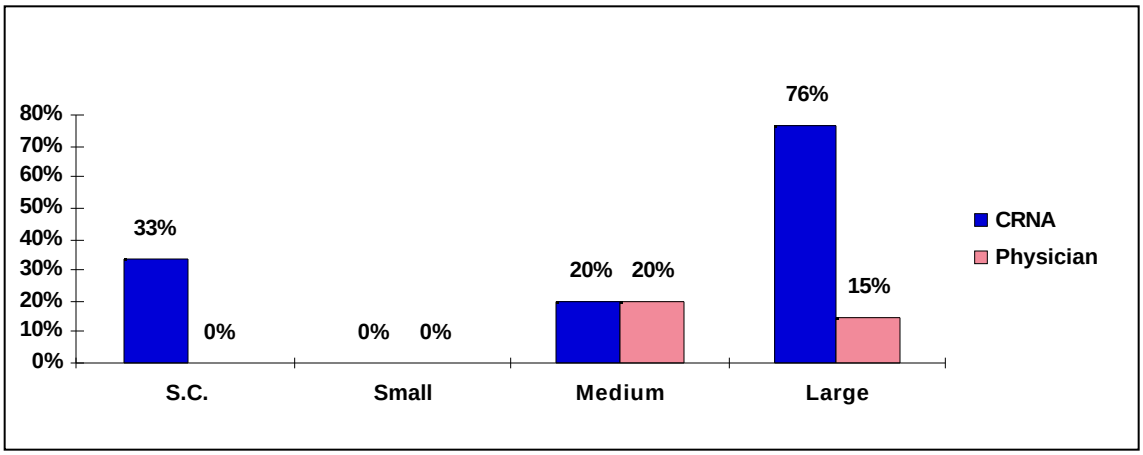
Distribution of 28 MTFs by Size.

Number of In-Patient Beds	Number of MTFs	Mean Number of Beds
0*	3	0
1 to 20 (small)	2	8
21 to 79 (medium)	10	46
80 to 500 (large)	13	214

*Surgery centers with no inpatient beds.
MTF - Medical Treatment Facility
Data acquired from 28/33 responses

Teaching Facilities

The MTFs were divided into teaching and nonteaching facilities. If the facility provided teaching to student registered nurse anesthetists (SRNAs) or resident physician anesthesiologists, it was categorized as a teaching facility. Of the 28 facilities responding to the survey, 15 were teaching and 13 were nonteaching. More SRNAs are taught at these facilities than physician residents. One of the three surgery centers taught SRNAs whereas none taught residents. Neither of the small MTFs provided teaching to either SRNAs or residents. Among the 10 medium sized MTFs two provided teaching to SRNAs only and two others to physician residents only. Among the 13 large MTFs, eight provided teaching to SRNAs only and two taught both SRNAs and physician residents. Thus, among the 28 MTFs in the survey, 13 provided teaching to SRNAs and four to physician residents. Only two of these facilities offered teaching to both groups (Figure 1). This separation of education may contribute to a lack of interdisciplinary teaching of anesthesia in the Army in addition to a reduced level of teaching of anesthesiology residents.



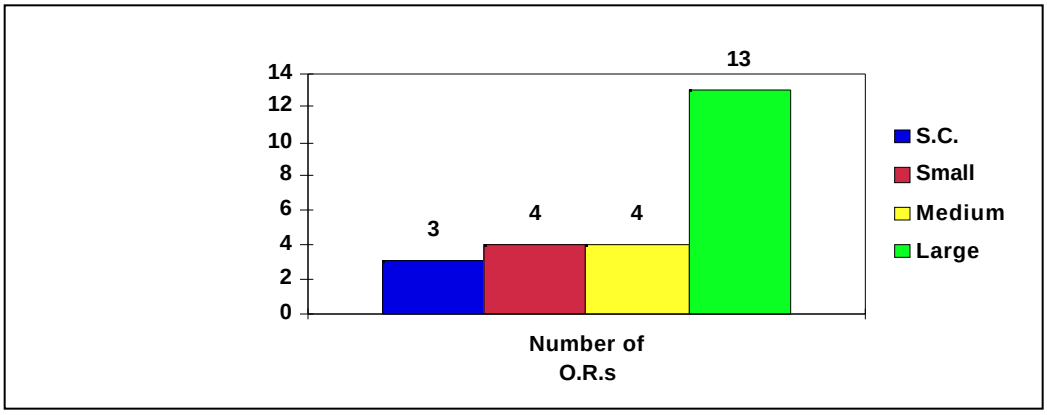
S.C. - Surgical Center, Small - Small MTF, Medium - Medium MTF, Large - Large MTF
Data acquired from 28/33 responses

Figure 1.

Percent of Army MTFs Providing Anesthesia Education.

Operating Rooms

The number of operating rooms in the MTFs varied from 2 to 21. The small and medium MTFs have about the same number of operating rooms. As expected, the facilities with the most operating rooms were the larger MTFs. (Figure 2.)



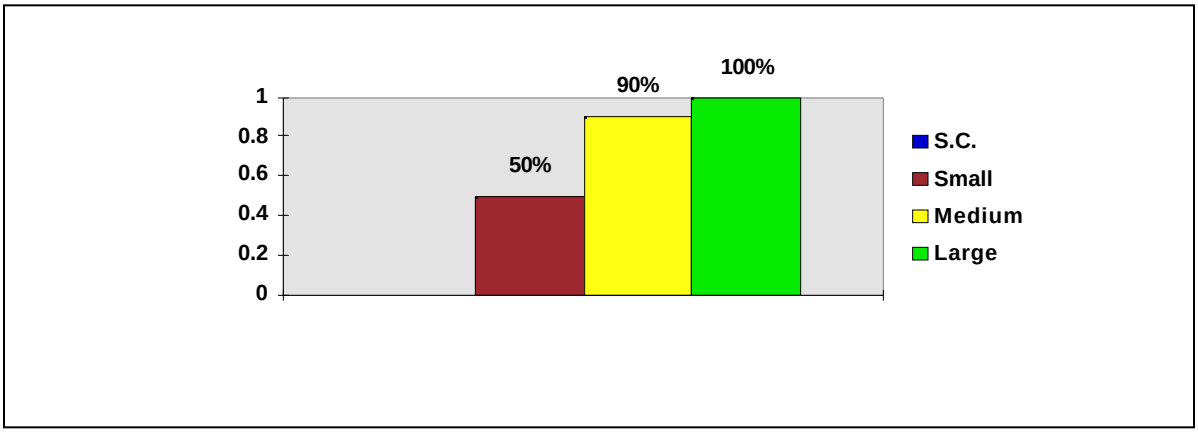
S.C. - Surgical Center, Small - Small MTF, Medium - Medium MTF, Large - Large MTF
O.R. - Operating Room
Data acquired from 28/33 responses

Figure 2.

Mean Number of Operating Rooms, by Size of Facility.

Emergency Services

The proportion of MTFs providing emergency services varies by size of the facility. Of the 28 facilities studied 70% provided emergency services. None of the surgery centers provided emergency room services and only 50% of the small MTFs provided such services. In the larger facilities nearly all provided these services (Figure 3). Of interest is the data showed one medium MTF provided emergency services without an anesthesiologist using only nurse anesthetists.



S.C. - Surgical Center, Small - Small MTF, Medium - Medium MTF, Large - Large MTF
E.R. - Emergency Room
Data acquired from 28/33 responses

Figure 3.

Percentage of Facilities Providing Emergency Services, by size of facility.

While 70% of MTFs provided emergency services 30% of the MTFs did not, and beneficiaries living in these areas have to obtain services elsewhere. It is not known from the survey data if they obtain emergency services from other military or civilian institutions in their area. The data shows that emergency services are provided whether or not there are physician anesthesiologists in the MTF. One medium MTF with emergency services does not have an anesthesiologist on staff whereas one medium MTF without emergency services does has an anesthesiologist on staff.

Surgical Centers

Most of the MTFs operate some type of surgical center or day surgery. The surgery centers offer only same day surgery. The surgery centers do not have inpatient beds, and can not provide overnight care for patients. Other MTFs provide some type of same day surgery within their facility (Appendix E). This provides a service for patients who do not need to be admitted to the hospital and are discharged some time shortly after their surgery. However, the small, medium, and large MTFs also have the means to admit patients into the hospital if they need to do so. They also use the hospital's operating rooms as they do not have a separate facility for their same day surgery patients. The surgical centers operate as free standing centers without the means to admit patients for long term or over night care.

Technicians

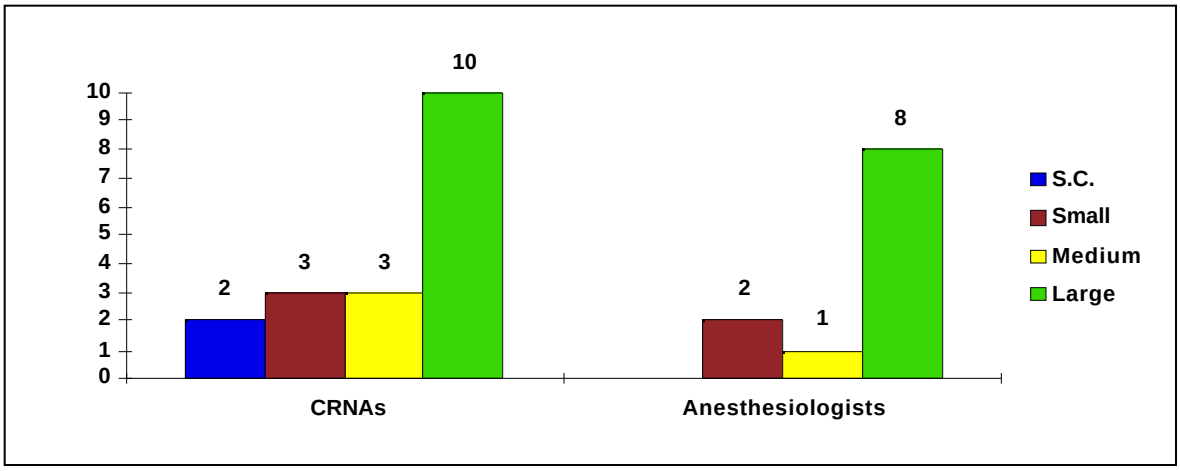
Anesthesia technicians provide a wide variety of services for the anesthesia department. Their tasks may include; stocking anesthesia carts, changing tubing, suction, equipment and cleaning equipment between cases. These are just a small example of the tasks anesthesia technicians may accomplish in an anesthesia department. Very few of the Army MTFs use or have anesthesia technicians. None of the surgical centers had anesthesia technicians. Only one small MTF, two medium MTFs and seven large MTFs have anesthesia technicians (Appendix F). This means only 35% of Army MTFs operate using anesthesia technicians with the majority being in the larger facilities. However, the data shows that the facilities with anesthesia technicians do not do any more cases per year than those without them.

Responses to the Research Questions

Research Question One

What are the anesthesia staffing patterns in surgical centers, small, medium, and large hospitals in the United States Army? To answer this

question the three subquestions must be addressed. First, what is the average number of CRNAs and anesthesiologists in the United States Army medical treatment facilities? There is a mixture of both military and civilian CRNAs in the United States Army, with both full and part-time civilian CRNAs, depending upon the site. Although according to the data provided there are few civilian CRNAs. The number of military CRNAs per MTF ranged from two to 18 with the majority in the large MTFs. There were three times as many CRNAs in the large MTFs compared to the others (Figure 4). Civilian CRNAs ranged from 0 to 9 with the majority in the large MTFs (Appendix G). There are no one anesthesia provider MTFs in the United States Army. There is a slightly different mixture of military and full-time civilian anesthesiologists (Appendix H). The only facilities with civilian anesthesiologists were large MTFs and there were eight times as many anesthesiologists in large MTFs compared to the other facilities (Figure 4). There are two surgery centers and one medium MTF operating without any anesthesiologists.



S.C. - Surgical Center, Small - Small MTF, Medium - Medium MTF, Large - Large MTF
Data acquired from 28/33 responses

Figure 4.

Mean Number of CRNAs and Anesthesiologists in MTFs, by Size of Facility.

Three large MTFs operate with more anesthesiologists than CRNAs. One of the large MTFs has 19 anesthesiologists and 14 CRNAs whereas, another large facility has 18 anesthesiologists and eight CRNAs (Appendix I). The ratio of anesthesiologist to CRNA for the surgical centers and small and medium MTFs were lower than for the large MTFs. The anesthesiologist to CRNA ratio in the surgical centers was 0:2 and the small and medium MTF ratio was 1:2. The large MTFs anesthesiologist to CRNA ratio was 1:1 (Appendix J). As will be shown later the surgical centers, small and medium MTFs do more cases per provider with the lower anesthesiologist to CRNA ratio than those with the higher ratio. However, what the survey instrument did not address was why the ratios are higher in the large MTF because the personnel at the large MTFs may be conducting research, teaching, or managing large pain clinics. Therefore, providers in large MTFs may have responsibilities other than administering anesthesia. This information is beyond the scope of this research project and warrants further investigation.

Research Question 1b

How many years have CRNAs and anesthesiologists been practicing anesthesia?

There was a wide range of experience among the military nurse anesthetists and anesthesiologists. The CRNAs experience ranged from less than one year to 21 years, and the anesthesiologists experience ranged from less than one year to 30 years. The most experienced CRNA providers currently are at the surgical centers, with a mean of six years of anesthesia experience. The least experienced anesthesiologist providers are at the surgical centers, with their mean years of anesthesia experience being two. Also of interest is the most common years of experience (mode) in the large MTFs, which is the same for both CRNAs and anesthesiologists, under one year.

However, providers have much experience in those same facilities as the mean number of years of experience is also quite high. The mean years of experience at the large MTFs for CRNAs is five years and anesthesiologists four years of experience (Table 2).

Table 2.

Mean and Mode Years of Experience For CRNAs and Anesthesiologists in United States Army MTFs.

MTFs	CRNA Mean	Anesthesiologist Mean	CRNA Mode	Anesthesiologist Mode
S.C.	6	2	7	2
Small	4	2	3	2
Medium	6	4	7	1
Large	5	4	1	1

S.C. - Surgical Center, Small - Small MTF, Medium - Medium MTF, Large - Large MTF
Data acquired from 28/33 responses

More CRNAs tend to stay in the Army and practice anesthesia longer than most anesthesiologists. This is supported by the fact that the mode of years of experience for the CRNAs is higher than for the anesthesiologists.

The majority of military nurse anesthesia providers have an American Association of Nurse Anesthesia (AANA) certificate and a master degree in anesthesia, and the majority of physicians providers are American Society of Anesthesiology (ASA) board certified. Only 10% of the CRNAs in large MTFs do not have a master degree in anesthesia (Appendix K). Whether these providers have a master degree in another field, was not determined by the survey. Anesthesiologists are in varying stages of passing the written and oral ASA boards with the majority having ASA board certification (Appendix L).

Research Question 1c

What are the military ranks of anesthesia providers in the United States Army? The majority of all anesthesia providers hold the United States Army

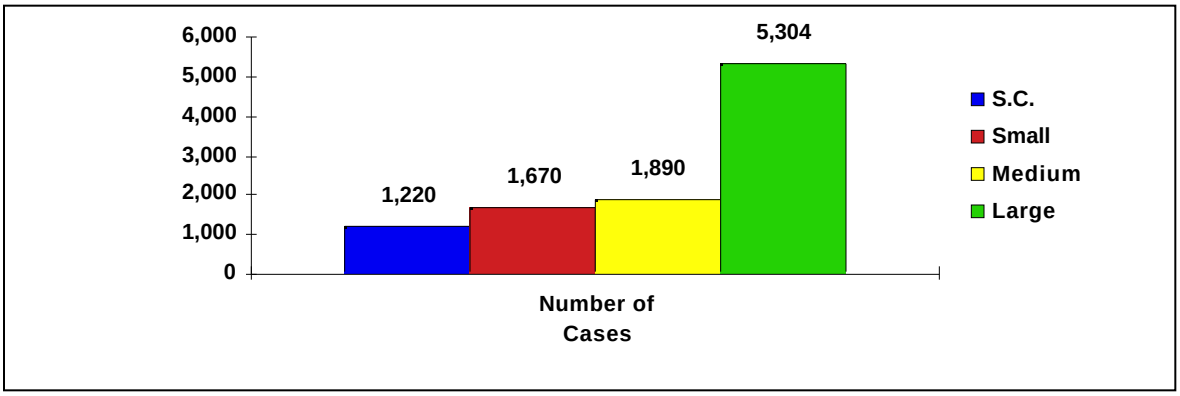
officer rank of Major (Appendix M). For the nurse anesthetists in all categories the mode for rank is Major. The anesthesiologists mode for rank in the surgical centers and small MTFs is captain. However, in the medium and large MTFs the anesthesiologists mode for rank is Major (Appendix M). For CRNAs and anesthesiologists in the medical field rank does not always equal years of anesthesia experience.

Research Question One

What are the anesthesia staffing patterns in surgical centers, small, medium, and large, hospitals in the United States Army? Usually more nurse anesthetists than anesthesiologists staff MTFs of the Army. While both the least and the most experienced CRNAs are staffing the large MTFs, only the most experienced are staffing the surgical centers. For example, there were no CRNAs with less than one year of experience in surgical centers or small MTFs. The mode for experience in large MTFs was less than one year with a range of experience from less than one year to 21 years. The least experienced anesthesiologists are staffing the surgical centers and small MTFs whereas the most experienced are staffing the medium and large MTFs. There is also a higher ratio of anesthesiologist to CRNA in the larger facilities. Why there are more physicians in the large MTFs compared to the rest of the MTFs, and why the ratios of physician to CRNA are higher remain unanswered by this research instrument and warrant further investigation.

Research Question Two

On average how many cases are performed in the surgical centers, small, medium, and large hospitals? The mean number of cases per year increased as the size of the hospital increased (Figure 5).

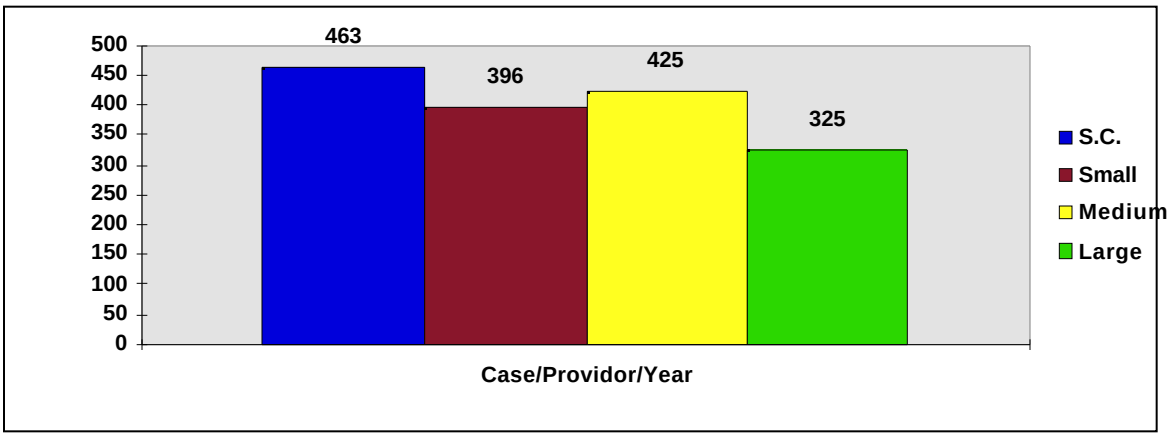


S.C. - Surgical Center, Small - Small MTF, Medium - Medium MTF, Large - Large MTF
Data acquired from 28/33 responses

Figure 5.

Mean Number of Cases Per Year Per MTF.

However, when the case per provider per year was calculated, the large MTFs fall behind the smaller facilities. Data show that surgical centers, small, and medium MTFs all do more cases per provider per year than the large MTFs (Figure 6 and Appendix N & O).



S.C. - Surgical Center, Small - Small MTF, Medium - Medium MTF, Large - Large MTF
Data acquired from 28/33 responses

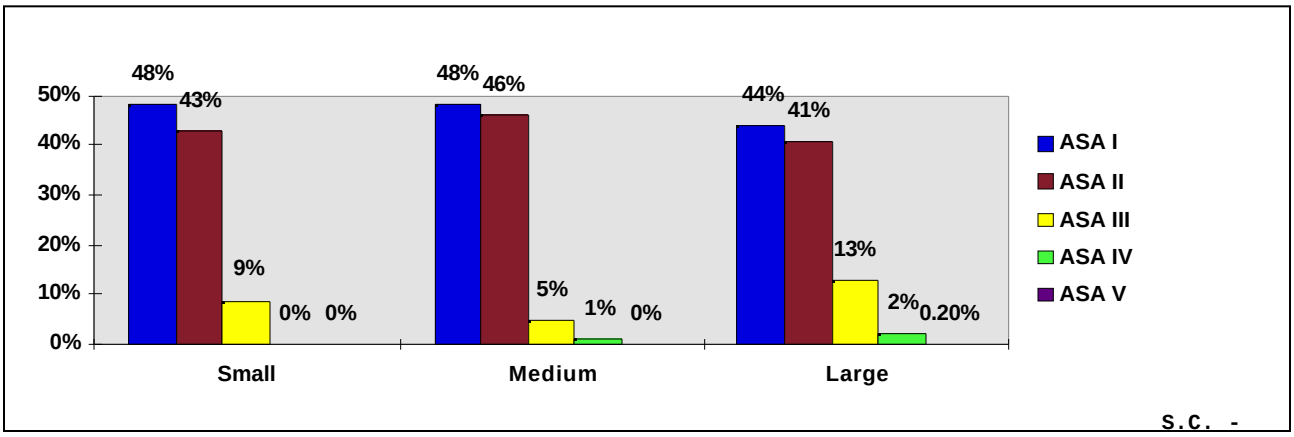
Figure 6.

Mean Number of Cases Per Anesthesia Provider Per Year Surgical Centers, Small, Medium and Large MTFs.

Therefore, the data shows less cases per provider being accomplished at the larger facilities where the anesthesiologist to CRNA ratio is 1:1. This decrease in productivity could be due to more difficult cases, administrative duties, or teaching. However, these questions are as of yet unanswered, beyond the scope of this research project and warrant further investigation.

Question 2a

What level of acuity are the patients who receive anesthesia at these hospitals? This information was not provided by all of the respondents. No acuity information was provided by any of the surgical centers. The small and medium MTFs reported more than 90% of their patients are in the American Society of Anesthesiologists classifications (ASA) of I and II, with the remainder of patients categorized as ASA IIIs. The large MTFs cases reported about 85% ASA I and IIs, the remainder being ASA IIIs and IVs (Figure 7 & Appendix Q). There are very few ASA Vs patients receiving anesthesia at Army MTFs. The data show that the "sicker" or more medically complex patients are having surgical procedures in the larger facilities. However, what is not clear is if the cases are more complex at the larger facilities and warrant extra staff and increased number of anesthesiologists and anesthesia technicians.



S.C. - Surgical Center, Small - Small MTF, Medium - Medium MTF, Large - Large MTF
Data acquired from 28/33 responses

Figure 7.

Percent of Patient Acuity's Per MTF.

First Assignment Question

The last question in the personnel section of the survey instrument asked; In your opinion, what size and type of facility should a new graduate CRNA be assigned? The responses were remarkable. Of the 28 respondents 22 chose medium nonteaching facilities, to first assign new graduates CRNAs. This was an extraordinary 78% agreement among the chief nurse anesthetists. Their reasoning was also similar including: The exposure to large case mix and large volume of cases (Appendix P). Also mentioned as a reason was they provide an opportunity for new graduates to develop their skills, confidence, and independence. As one respondent stated; "They provide the graduate with the opportunity to maximize experience and self reliance without too much interference."

Survey Question 19

At your facility, do the CRNAs in your department serve as a member on any hospital-wide committees? The data provided demonstrated that most of the CRNAs in United States Army MTFs do participate in a wide variety of hospital committees. This adds yet another aspect to the CRNAs role in United States Army MTFs. This also correlates with Martineau's (1996) study. His study found that CRNAs in the Indian Health Service also contribute to hospital committees.

Summary

In summary, the survey instrument provided information about personnel characteristics of anesthesia departments in United States Army, surgical centers, small, medium, and large MTFs. The population was the anesthesia departments at each facility. Survey instruments returned by Chief CRNAs numbered 28 out of 33, an 85% return rate. Two more surveys have recently

been returned bring the total response to 91%. Their information is not included in the statistics as they arrived to late.

Inpatient beds ranged from 0 to 500 with the number of operating rooms ranging from 2 to 21. Facilities with large number of operating rooms also have more inpatient beds. The Army's anesthesia departments operate mainly without anesthesia technicians. Only 35% of the Army MTFs operate with anesthesia technicians. The Army now has fewer hospitals, and have changed at least three sites from Army Community Hospitals, running 24 hours a day, to Clinics with day time surgical services only.

About half of MTFs are still teaching either nurse anesthesia students or anesthesiology residents, with the majority teaching SRNAs. There is little overlap of the two programs .

Emergency services are provided at 70% but not by all of the Army MTFs. However, they are offering day surgical services at surgical centers and at MTFs.

Staffing patterns are difficult to identify. There is a mixture of both military and civilian personnel. The majority of personnel are at the large MTFs, but at the same time, the staffing ratio of anesthesiologist to CRNA increases with a 1:1 or more ratio. There are three times as many CRNAs in the large MTFs as the other facilities, whereas the anesthesiologists show eight times as many at large MTFs compared to the other facilities. The majority of CRNAs remain in the Army longer and have more years of anesthesia experience than anesthesiologists. The CRNAs on the whole also tend to have higher military rank than the Army anesthesiologists.

The large MTFs perform more cases per year than the other MTFs. However, they also do fewer cases per provider per year. Higher acuity patients have surgery at the large MTFs, but the majority of cases for all facilities are still ASA I and II patients.

Chief nurse anesthetists believe that new graduate CRNAs should be assigned to medium nonteaching type of MTFs. Their rational is that this type of facility provides larger case mix as well as a place to gain independence.

Nurse anesthetists role does not end in the operating room. The data provided demonstrates they are also participating in a wide range of hospital committees.

The next chapter will focus on conclusions from the data received and recommendations for future research.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

Overview of the Study

The purpose of this study was to document the staffing patterns, education, and utilization of anesthesia providers in the United States Army. Also, to contribute to the literature regarding the roles of the personnel in those anesthesia departments.

The literature review demonstrated there is indeed a growing shortage of CRNAs in the Army. Literature review also suggested that the role of nurse anesthetists and anesthesiologists have not been clearly differentiated. The United States Army officer's role however, has been clearly defined. Anesthesia providers in the Army must perform both as officers and anesthesia providers. The roles are performed by individuals and are limited by the contextual specification of the Army and anesthesia departments in which these providers work. Therefore, their role as Army officers, and anesthesia providers is influenced by multiple factors.

Through the use of the Department of U.S. Medicine, U.S. Medicine Directory, (1996) and contact with the United States Total Army Personnel Command (PERSCOM) a directory of 33 United States Army Medical Treatment facilities was compiled. Both the continental United States (CONUS) and

outside the continental United States (OCONUS) were included. The developed survey instrument was mailed to the population of 33 anesthesia departments, using the Chief CRNA as the respondent. After the second mailing three weeks after the first, 28 of the 33 (85%) responded.

Conclusions

The Army has begun adjusting to the “right-sizing” motto of the current administration. The number of hospitals has decreased. At least three Army Community Hospitals have been changed into clinics providing only same day surgery.

About half of the MTFs are still teaching either nurse anesthesia students or anesthesiology residents. The majority are teaching only SRNAs. There is little overlap of the two programs.

Emergency services are provided by 70% of the Army MTFs. This agrees with the above “right-sizing”, however, it requires that military and civilians in the area to go elsewhere for their emergency care needs. The Army is changing with the current trends by offering day surgical services at all MTFs.

Unlike the civilian world the Army’s anesthesia departments operate mainly without anesthesia care technicians which warrants further investigation. The large MTFs also operate with a very high anesthesiologist to CRNA ratio of 1:1. The data did not show any increase in productivity, as measured by case per provider per year, at the facilities with technicians and higher ratio of anesthesiologist to CRNA. In fact, the data showed just the opposite, case per provider per year was much smaller in large MTFs, than those with lower staffing ratios and usually no anesthesia technicians. The surgical centers, small, and medium MTFs performed about 100 more cases per provider per year than the large.

Are the Army’s anesthesia care technicians being utilized to the best of their ability? Why are the staffing ratios so much higher in the large MTFs compared to the rest of the MTFs? Why is productivity so much lower in the large MTFs? These are questions are beyond this research study and warrant further investigation.

In the past decade our nation's health care costs have increased to almost 15% of the gross national product (GNP). Health care providers must take an active role in reducing these costs in a safe and productive manor. The data received from the surgical centers and small MTFs suggest that anesthesiologists and nurse anesthetists are used interchangeably. In medium and large facilities anesthesiologists are used mainly in a supervisory capacity while the CRNAs administer anesthesia in the operating rooms. The fact that nurse anesthetists are unsupervised in some facilities and not others raises the question: What is the best mix of providers at surgical centers, small, medium, and large MTFs in the United States Army?

Gunn (1996) has shown that “it costs approximately $635,700 to prepare one anesthesiologist from undergraduate studies through medical school and post graduate medical education”. The cost of educating a CRNA through both undergraduate and graduate education is approximately $59,000 - $75,000. Therefore, the United States Army could train 8 to 10 nurse anesthetists for what it costs to train one anesthesiologist. Also when comparing the salaries of the two providers it is quiet obvious that same rank providers, anesthesiologists and nurse anesthetists do not make the same salary (Appendix R). In the Army anesthesiologists can earn $50,000 - $59,500 above their base pay depending upon their rank, years of experience as an anesthesiologist, and board certified status. Nurse anesthetists on the other hand must be certified to practice and can earn only $8,000 - $20,000 a year above base pay. Because of these extreme differences in base pay and cost of education, the roles and best mix of these providers must be established. Each provider

should be utilized to the best of his or her abilities in order for the Army to begin to be cost effective in this era of “right sizing” and cost containment.

With the rising costs of health care and a continued shortage of CRNAs in the Army it remains imperative that CRNAs be proactive in defining their role as anesthesia providers. A role is defined as “those behaviors characteristic of one or more persons in a context” (Biddle, 1979, p. 58). In this research the context is that CRNAs are Army officers, the majority of whom are majors and well educated with a master’s degree in anesthesia. Army anesthesiologists are also well educated, with the majority being board certified. They are also Army officers, but about half are captains and half majors. Years of experience also helps to define roles. On the whole Army nurse anesthetists have more years of anesthesia experience and stay in the Army longer than the anesthesiologists.

Education is a important factor in defining of roles. Education is the foundation of ones profession. Over the years nurse anesthesia has evolved and advanced in anesthesia care. Currently (1998) all nurse anesthesia training programs must be in a master’s degree framework. The Army implemented a master’s degree program starting in 1982 and has continued to be a forerunner in advanced education. At least ninety percent of the CRNAs in the Army have a master’s degree in anesthesia. It is unclear if the remainder hold a master’s degree in other fields.

In conclusion, CRNAs in the United States Army are well-educated military officers. By completing their master’s degree they are prepared for roles not included in other, older training programs. The CRNAs in the United States Army today are better prepared for broader professional roles. In the extremely technical and diverse roles of the Army, CRNA education is unquestionably the key to influencing the behaviors that will be comparable with the CRNAs of the future.

Recommendations

In light of the remarkable contributions of CRNAs in the United States Army, it makes sense that they would be used to their fullest capability. However, data in this research demonstrated inconsistent use of CRNAs. The ratio of anesthesiologist to CRNA vary greatly from one MTF to another. Some MTFs require medical direction or supervision of CRNAs by anesthesiologists, whereas other facilities enjoy a more collaborative work environment. In some MTFs CRNAs work side by side with anesthesiologists each independently administering anesthesia, but at the same time available and willing to help others when needed. Other MTFs assign both a CRNA and an anesthesiologist to each operating room . With the rise in cost of health care and the continuing “right-sizing” of the Army we can no longer continue with the inconsistencies. This research provided base line data describing roles and mix of anesthesia providers in United States Army MTFs. However, what the best mix of anesthesia providers for MTFs should be determined.

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Appendix A
Letter to Chief CRNA
Requesting Participation
in Study

To: Chief CRNA,

I am currently a graduate nurse anesthesia student, at the Uniformed Services University of the Health Sciences. To complete my masters degree I am conducting thesis research on anesthesia department work load characteristics in small, medium, large, teaching and non-teaching hospitals in the Army. This survey will be distributed to every Army facility providing anesthesia

services. The information from this survey should assist in documenting the importance of the CRNA role and their value to the military. The questions are designed to gather basic demographic information, practice patterns and provider responsibilities.

All information and responses provided will be held under lock and key and in strict confidentiality. Return surveys will be coded for tracking purposes only. Once all the data is collected and analyzed, individual surveys will be destroyed. All information provided will be analyzed as group data only, individuals or facilities will not be identified.

As the senior nurse anesthetist in your facility, I realize your time is extremely valuable however, I hope you will take the time to complete the survey, which should take approximately 40 minutes. If data is not readily available for any particular item, please provide your best estimation. Please return the survey and any supporting documents in the self addressed stamped envelope provided, by November 24, 1997.

If you have any questions about this survey you may contact me, (410) 674-6210 or my advisor, Dr. Maura McAuliffe, CRNA, Lt. Col., USAF, NC at (301) 295-6565, DSN 295-6565. Thank you for your assistance in this educational endeavor.

Sincerely,

Jessetta K. Joswick, SRNA
1LT, AN, USA

Uniformed Services University of the Health Sciences/Graduate School of Nursing
4301 Jones Bridge Road, Box 809
Bethesda, MD 20814-4799

If you would like to be provided with the results of this study, please provide your name and address on the bottom portion of this letter and return it with the survey.

Appendix B
Data Collection Tool

Appendix C
Cover Letter from Nurse Anesthesia Consultant
to the United States Army Surgeon General
Requesting Participation in Study

Appendix D
Percent of Army MTFs Providing
Anesthesia Teaching

Appendix D

Percent of Army MTFs Providing Anesthesia Teaching.

	Nurse Anesthetist's	PERCENT	Resident Anesthesiologist's	PERCENT
Surgery Center n = 3	1	33%	0	0
Small n = 2	0	0	0	0
Medium n = 10	2*	20%	2*	20%
Large n = 13	10°	76%	2°	15%

* These MTFs that teach nurse anesthetist's are different than those that teach resident anesthesiologists.
° These two MTFs teach anesthesiologist residents also teach SRNAs.
Data received from 28/33 MTFs.

Appendix E
Percentage and Type of Same Day Surgery
Provided at United States Army MTFs.

Appendix E.

Percentage And Type of Same Day Surgery Provided at United States Army MTFs.

		SURGICAL CENTER (with separate operating rooms)	PERCENT	SAME-DAY SURGICAL CENTER (using the hospital's operating rooms)	PERCENT
Surgery Center	n = 3	3	100%	0	0
Small	n = 2	0	0	2	100%
Medium	n = 10	0	0	8	80%
Large	n = 13	0	0	11	85%

Data received from 28/33 MTFs.

Appendix F
Mean and Mode of Anesthesia Care Technicians
in United States Army MTFs

Appendix F.

Mean and Mode of Anesthesia Care Technicians in United States Army MTFs.

MTFs		n - Technicians	MEAN	MODE
Surgery Center	n = 3	0	0	0
Small	n = 2	1	1	0
Medium	n = 10	2	0.2	0
Large	n = 13	24	1.8	2

Data received from 28/33 MTFs.

Appendix G
Number of CRNAs in
United States Army
MTFs, n, Range and Mean

Appendix G.

Number of CRNAs in United States Army MTFs, n, Range and Mean.

	Military			Full-Time Civilian			Part-Time Civilian		
	n	Range	Mean	n	Range	Mean	n	Range	Mean
Surgery Center n = 3	6	2	2	2	0-2	0.66	0		
Small n = 2	5	2-3	2.5	1	0-1	0.5	0		
Medium n = 10	33	2-8	3.3	8	0-4	0.8	1	0-1	0.1
Large n = 13	125	4-18	9.6	25	0-9	1.9	10	0-6	0.76

Data received from 28/33 MTFs.

Appendix H
Number of Anesthesiologists in
United States Army MTFs, n, Range and Mean.

Appendix H.

Number of Anesthesiologist's in United States Army MTFs n, Range and Mean.

	Military			Civilian		
	n	Range	Mean	n	Range	Mean
Surgery Center n = 3	1*	0-1	.33	0		
Small n = 2	3	1-2	1.5	0		
Medium n = 10	15°	0-3	1.4	0		
Large n = 13	104**	2-23	8	9	0-4	.7

* There are two surgery centers operating without an anesthesiologist.
° There is one medium MTF operating without an anesthesiologist.
** There are two large MTF operating with more anesthesiologist's than CRNAs.
Data received from 28/33 MTFs.

Appendix I
Number of CRNAs and Anesthesiologists
at the Large MTFs in the United States Army.

Appendix I.

Number of Military CRNAs and Anesthesiologists at the Large MTFs in the United States Army.

	Anesthesiologists	CRNAs
Large n = 13		
Hospital 1	2	4
Hospital 2	10	12
Hospital 3	2	6
Hospital 4	8	16
Hospital 5	7	12
Hospital 6	3	3
Hospital 7	**19**	**14**
Hospital 8	1	4
Hospital 9	3	4
Hospital 10	12	18
Hospital 11	11	18
Hospital 12	**8**	**6**
Hospital 13	**18**	**8**

Data received from 28/33 MTFs.

Appendix J
Ratio of Anesthesiologists to CRNAs
at United States Army MTFs.

Appendix J.

Ratio of Anesthesiologists to CRNAs at United States Army MTFs.

Hospital	Anesthesiologists	CRNAs	Ratio
Surgery Center #1	1	2	**1 : 2**
Surgery Center #2	0	2	**0 : 2**
Surgery Center #3	0	2	**0 : 2**
Small MTF #1	1	2	**1 : 2**
Small MTF #2	2	3	**1 : 1.5**
Medium MTF #1	1	2	**1 : 2**
Medium MTF #2	2	5	**1 : 2.5**
Medium MTF #3	1	2	**1 : 2**
Medium MTF #4	1	2	**1 : 2**
Medium MTF #5	2	4	**1 : 2**
Medium MTF #6	1	3	**1 : 3**
Medium MTF #7	3	3	**1 : 1**
Medium MTF #8	1	2	**1 : 2**
Medium MTF #9	0	3	**0 : 3**
Medium MTF #10	3	8	**1 : 2.6**
Large MTF #1	10	12	**1 : 1.2**
Large MTF #2	2	4	**1 : 2**
Large MTF #3	2	6	**1 : 3**
Large MTF #4	7	12	**1 : 1.7**
Large MTF #5	8	16	**1 : 2**
Large MTF #6	11	13	**1 : 1.2**
Large MTF #7	3	4	**1 : 1.3**
Large MTF #8	1	4	**1 : 4**
Large MTF #9	19	14	**1.3 : 1**
Large MTF #10	3	3	**1 : 1**
Large MTF #11	18	8	**2.3 : 1**
Large MTF #12	8	6	**1.3 : 1**
Large MTF #13	11	18	**1 : 1.6**

Data received from 28/33 MTFs.

Appendix K
Nurse Anesthetists With a
Master’s Degree in Anesthesia

Appendix K.

Nurse Anesthetists With a Master’s Degree in Anesthesia.

	MASTERS	n	PERCENTAGE

Surgery Center	n = 3	6	6	100%
Small	n = 2	5	5	100%
Medium	n = 10	33	33	100%
Large	n = 13	112	125	90%

Data received from 28/33 MTFs.

Appendix L
Anesthesiologists in United States
Army MTFs Passed Written and Oral Boards

Appendix L.

Anesthesiologists in United States Army MTFs Passed Written and Oral Boards by Size of Facility.

	n	WRITTEN BOARD	PERCENT	ORAL BOARD	PERCENT
Surgery Center n = 3	1	1	100%	1	100%
Small n = 2	3	3	100%	2	66%
Medium n = 10	15	13	86%	12	80%
Large n = 13	86*	79	92%	65	75%

Data received from 28/33 MTFs.
* Not all of the large MTFs provided this information.

Appendix M
CRNA and Anesthesiologists Rank
in United States Army MTFs

Appendix M.

CRNA and Anesthesiologists Rank in United States Army MTFs.

MTFs	CRNA		Anesthesiologist's	
	RANGE n	MODE	RANGE n	MODE
Surgery Center n = 3	03-05 n = 6	04	03-03 n = 1	03
Small n = 2	03-04 n = 5	04	03-04 n = 3	03
Medium n = 10	02-06 n = 33	04	03-06 n = 15	04
Large n = 13	03-06 n = 125	04	03-06 n = 104	04

Data received from 28/33 MTFs.

Appendix N
Case Per Provider Per Year at
MTFs in the United States Army

Appendix N.

Case Per Provider Per Year at MTFs in the United States Army.

MTFs	Number of Providers	Total Number of Cases Per Year	Cases Per Provider Per Year
Surgery Centers #1	3	2640	880
#2	2	240	120
#3	2	780	390
Small MTFs #1	3	940	313
#2	5	2400	480
Medium MTFs #1	3	1200	400
#2	7	2700	386
#3	3	2400	800
#4	3	1500	500
#5	6	1600	266
#6	4	1680	420
#7	6	1632	272
#8	3	1400	466
#9	2	760	380
#10	11	4030	366
Large MTFs #1	22	4800	218
#2	6	1800	300
#3	8	3600	450
#4	19	4200	221
#5	24	6000	250
#6	24	8400	350
#7	7	1900	271
#8	5	1600	320
#9	33	9600	290
#10	6	3100	516
#11	26	10,200	392
#12	14	4750	339
#13	29	9000	310

Data received from 28/33 MTFs.

Appendix O
Mean Number of Cases
Per Provider Per Year

Appendix O.

Mean Number of Cases Per Provider Per Year.

MTFs	Mean - Cases/Provider/Year	Standard Deviation

Surgical Centers	463	385.27
Small	396	118.09
Medium	425	150.66
Large	325	86.76

Data received from 28/33 MTFs.

Appendix P
Responses to Survey Instrument
Question #29

Question #29 of the survey instrument asked; In your opinion, what type of facility should a new graduate CRNA be assigned and why?

Survey instrument respondents answered and commented as follows.

Surgery Center's

1. Medium Non-teaching
“As a phase II program director I witnessed the “inbreeding” and ultra dependency of new grads on anesthesiologists and their 1:1 or at most 1:2 staffing ratios.”

2. Medium Non-Teaching
“Medium will give a variety of cases in several different areas, while non teaching to give the new practitioner the chance to hone and develop existing strategies and develop confidence needed on-call to handle emergency situations.”

3. Medium or Large Teaching
“Volume/greater number of experiences."

Small MTFs

1. Medium Teaching
“Medium to large to provide enough cases and variety to get their legs on the ground as a new provider. Teaching because they can still learn so much from the variety.”

2. Medium Non-Teaching
“Larger case mix - student too new to be teaching and usually students given the best cases at teaching hospitals. Small places may not have a large case mix.”

Medium MTFs

1. Large Teaching/Non Teaching
“New graduates don’t have the depth of experience to operate in smaller places.”

2. Medium Non Teaching
“They really could be assigned any of the above optimally they would do better in a place where they could do the most cases.”

3. Medium Non-Teaching
“Need variety of cases, do not need to supervise students need to work independently on call.”

4. Medium Non Teaching
“Need a variety of cases while building independence.”

5. Medium Non Teaching
“To gain a wide experience of surgical cases at a fast pace, while learning to work in an autonomous environment.”

6. Medium Teaching
“opportunity for independent practice greater, higher volume “bread and butter” cases to develop skills/confidence. Opportunity for teaching maintains didactic knowledge base.”

7. Medium Non-Teaching
“A medium size place is busy yet not overwhelming or too big to allow for autonomy. Non teaching so the “good” cases don’t get assigned to students.”

8. Medium Non-Teaching
“Right mix of healthy/non-healthy patients. Allows you to learn time management, experience call, get your feet wet making your own decisions.”

9. Medium Non-Teaching
“Because this combination gives new CRNA’s variety of cases, do not have to compete with students/residents for cases, develop their own practice.”

10. Medium Non-Teaching
“Minimal competition for cases, greater likelihood to practice more independently, and greater likelihood to be involved in field activities.”

Large MTFs

1. Medium Non-Teaching
“New graduates need hands on experience to develop their skills, judgment, and confidence. MEDCENS all have some combination of anesthesia learners (student nurse anesthetists, residents and surgery residents, transitional visiting interns) who require experienced guidance and takes away the opportunities for experience for new nurse anesthesia graduates. Medium size facilities would have the case load to provide experience with few to no “learners”. Small places need CRNA’s with experience because they more likely will practice alone.”

2. Medium Non-Teaching
“Maximize experience and self reliance without too much interference.”

3. Medium Non-Teaching
“Adequate cases without competing with students.”

4. Medium Non-Teaching
“Provide adequate number of cases but allow some autonomy also.”

5. Medium Teaching
“Medium facility provides large variety of cases with opportunity for autonomy teaching provides opportunity for further learning without severe time constraints.”

6. Medium Non-Teaching
“Need continued exposure to anesthetics. Experiences non teaching.”

7. Medium Non-Teaching
“A new grad must learn to make independent decisions under pressure. A medium facility has a good support structure but there is no one else close by when things go bad in the middle of the night.”

8. Medium Non-Teaching
“I believe it is critical to function independently that new grads do as much hands on care as possible - not staff students, and not be over supervised at a MEDCEN. We need to breed skill and independence. Those traits only come with appropriate experience.”

9. Large Non-Teaching

“Adequate supervision; adequate case mix and volume; good call experience; presence of OB services.”

10. Large Teaching
“Larger variety of cases and more chance for professional development.”

11. Medium Non-Teaching
“More independence, call, OB experience and case volume.”

12. Medium Non-Teaching
“No Comment”

13. Medium Non-Teaching
“To optimize exposure to cases; but I feel that large teaching (or non-teaching) facilities are also reasonable.”

Appendix Q
Hospital Acuity's

Acuity's for one month of cases (September, 1997).

None of the surgery centers provided statistics.

Small Hospital #1					
ASA n - 54	I	II	III	IV	V
n	26	23	5	0	0
Percentage	48%	43%	9%		

Mode - ASA I
This facility does not do ASA IV & V.

Small Hospital #2 provided no statistics.

Medium Hospital #1 does ASA I, II, III cases only. They did not provide any statistics.

Medium Hospital #2 does ASA I, II, III, IV, V cases. They did not provide any statistics.

Medium Hospital #3 does ASA I, II, III cases only. They did not provide any statistics.

Medium Hospital #4 does ASA I, II, III, IV, V cases. They did not provide statistics.

Medium Hospital #5 does ASA I, II, III cases. They did not provide any statistics.

Medium Hospital #6					
ASA n - 110	I	II	III	IV	V
n	40	61	8	1	0*
Percentage	36%	56%	7%	1%	

Mode ASA II
* This hospital does do ASA V classification cases, however did not have any the month statistics where provided for.

Medium Hospital #7					
ASA n - 144	I	II	III	IV	V
n	87	54	3	0	0
Percentage	60%	38%	2%		

Mode ASA I
This facility does not do ASA IV & V.

Medium Hospital #8 did not provide any statistics.

Medium Hospital #9 did not provide any statistics.

Medium Hospital #10 did not provide any statistics. They do provide services to all ASA classifications.

Large Hospital #1					
ASA n - 359	I	II	III	IV	V
n	114	171	61	8	3
Percentage	32%	48%	17%	2%	.8%

Mode ASA II

Large Hospital #2					
ASA n - 123	I	II	III	IV	V
n	62	42	19	0	0
Percentage	51%	34%	15%		

Mode ASA II

Large Hospital #3 did not provide statistics. They do provide services to all ASA classifications.

Large Hospital #4					
ASA n - 290	I	II	III	IV	V
n	180	106	4	0	0
Percentage	62%	37%	1%		

Mode ASA I

This facility does do ASA classification IV & V, but had none for the month of the statistics.

Large Hospital #5 provided no statistics. They do provide services to all ASA classifications.

Large Hospital #6 provided no statistics. They do provide services to all ASA classifications.

Large Hospital #7 provided no statistics. They do provide services to all ASA classifications.

Large Hospital #8 provided no statistics.

Large					

Hospital #9					
ASA n - 674	I	II	III	IV	V
n	176	305	144	48	1
Percentage	26%	45%	21%	7%	0.1%

Mode ASA II

There were 267 cases where no ASA was reported.

Large Hospital #10					
ASA n - 244	I	II	III	IV	V
n	157	80	7	0	0
Percentage	64%	33%	3%		

Mode ASA I

This facility only provides care for ASA I, II, and III classifications.

Large Hospital #11 provided no statistics. They do provide services to all ASA classifications.

Large Hospital #12					
ASA n - 385	I	II	III	IV	V
n	144	166	65	10	0
Percentage	37%	43%	17%	3%	

Mode ASA II

Large Hospital #13					
ASA n - 695	I	II	III	IV	V
n	237	333	111	13	0
Percentage	34%	48%	16%	2%	

Mode ASA II

Appendix R
Special Pay for Anesthesiologist’s
in the United States Army

Appendix R.

Special Pay for Anesthesiologists in the United States Army.

Years of Creditable Service as an anesthesiologist's	Variable Special Pay Annual (VSP)	Board Certified Pay Annual (BCP)	Medical Additional Special Pay (MASP)	Incentive Special Pay (ISP)	Total With BCP _____ Without BCP
Less Than 6	$ 5,000	$2,500	$15,000	$30,000	$52,500 50,000
6 But Less Than 8	$12,000	$2,500	$15,000	$30,000	$59,500 57,000
8 But Less Than 10	$11,500	$2,500	$15,000	$30,000	$59,000 56,500
10 But Less Than 12	$11,000	$3,500	$15,000	$30,000	$59,500 56,000
12 But Less Than 14	$10,000	$4,000	$15,000	$30,000	$59,000 55,000
14 But Less Than 18	$ 9,000	$5,000	$15,000	$30,000	$59,000 54,000
18 But Less Than 22	$ 8,000	$6,000	$15,000	$30,000	$59,000 53,000
22 or More Years	$ 7,000	$6,000	$15,000	$30,000	$58,000 52,000
Grad 07 & Above	$ 7,000	$6,000	$15,000	$30,000	$58,000 52,000

Appendix S
Nurse Anesthetist’s Special Pay
in the United States Army.

Appendix S.

Nurse Anesthetist’s Special Pay in the United States Army.

Years of Creditable Service as CRNA	Nonphysician Health Care Provider Board Certified Pay (BCP)	ISP	Total
Less than 5 years	$2,000	$ 6,000	$ 8,000
At least 5 but less than 10 years	$2,000	$15,000	$17,000
At least 10 but less than 12 years	$2,500	$15,000	$17,500
At least 12 but less than 14 years	$3,000	$15,000	$18,000
At least 14 but less than 18 years	$4,000	$15,000	$19,000
18 or more years	$5,000	$15,000	$20,000