

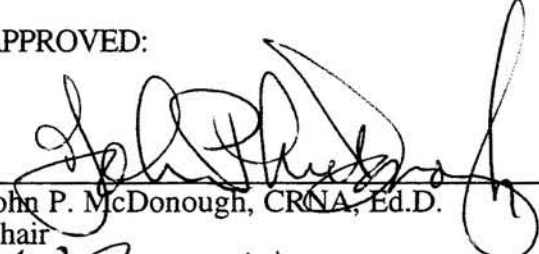


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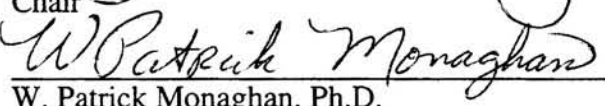
WHAT IS THE ROLE OF CERTIFIED REGISTERED NURSE ANESTHETISTS IN THE INDIAN HEALTH SERVICE?

Mark J. Martineau, LTJG, USPHS

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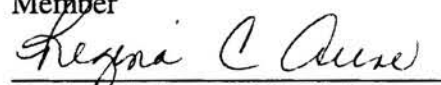
  
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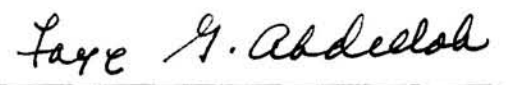
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President of PLU Men's Association of Nursing Students, Pacific Lutheran University, Tacoma, WA 1990-1991.

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Copyright Statement

WHAT IS THE ROLE OF CERTIFIED REGISTERED NURSE ANESTHETISTS  
IN THE INDIAN HEALTH SERVICE?

by  
Mark J. Martineau  
April, 1996

Abstract

The problem of how and whether to utilize Certified Registered Nurse Anesthetists (CRNAs) has been controversial both historically and today (Bankert, 1993). Concerning CRNAs in the U.S. Indian Health Service (IHS), data on utilization and service was nonexistent. This study describes the roles and capabilities of IHS CRNAs. A self-administered questionnaire was mailed to the target population. Descriptive statistics were used to present demographic data and CRNA involvement in key areas. It was found that 76 percent of the sample were commissioned corps officers of the U.S. Public Health Service. Only 47 percent of the sample population claimed an anesthesiologist had been at their clinical site during the entire year. All CRNAs in the sample practiced regional anesthesia. Subjects also participated in diverse professional activities beyond clinical anesthesia. It was concluded that IHS CRNAs provide a broad range of services and may practice without the collaboration of an anesthesiologist.

WHAT IS THE ROLE OF CERTIFIED REGISTERED NURSE ANESTHETISTS  
IN THE INDIAN HEALTH SERVICE?

by

Mark J. Martineau, BSN, RN

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 in NURSING

UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

September 1996

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Acknowledgement must also be made to the Tuba City Service Unit of the Indian Health Service (IHS) for making this educational opportunity possible. Appreciation is extended to Dr. Steve Holve, Dr. Dudley Beck, and Ms. Rosalyn Curtis for their support in relation to this.

Also, I would like to thank Mr. Darrell E. Pratt, Chief, IHS Health Professions support branch for providing advice and information useful in creating a roster of CRNAs in the IHS.

Lastly, appreciation is extended to the faculty of the research department of the USUHS Graduate School of Nursing for their willing assistance, support and encouragement.

## DEDICATION

I would like to dedicate this research project to my two sons; Joshua Jean and Rodney Boone. Thank you for being as understanding and patient as one could ever hope a seven and nine year old to be. May worthy goals drive and invigorate your travels and grant you success and happiness.

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CHAPTER ONE  
INTRODUCTION

Statement of the Problem

The practice and role of Certified Registered Nurse Anesthetists (CRNAs) has developed for over 100 years and continues to evolve. Where this maturation process should lead is controversial. In fact, the role CRNAs will play in future anesthesia delivery is open to debate. Notwithstanding its history and debated role in anesthesia, the profession is still relatively unknown. Data concerning CRNA practice and contributions are unpublished, and sometimes do not exist. Such deficits seem ominous during times of health care evaluation and restructuring. The lack of recognition for the CRNA role cannot be viewed as an advantage for nurse anesthesia. This disadvantage may affect the overall profession as well as CRNAs within specific organizations. For example, it was known that CRNAs practice in the Indian Health Service (IHS). But, how many, where, and doing what was not known. This lack of information concerning IHS CRNA contributions does not foster recognition and role security.

The tumultuous evolution of the nurse anesthetist role and the need to continue to define and document that role has been well attested to by Bankert, (1993); Gunn, (1991); Kelly, (1991); Lester and Thomson (1989b); Mannino, (1994); Stoll, (1988); and Thatcher, (1953).

In considering the evolution of the nurse anesthetist role, it is worth noting that the legal regulation of nurse anesthesia practice has largely been a process of ratifying existing practice rather than creating new parameters for the profession (Tobin,

1994). In this author's opinion, this supports documenting what current CRNA practice entails. As shall be shown, the publications of Alice Magraw verifying early accomplishments of nurse anesthesia played a critical part in supporting the CRNA role.

The current demand for anesthesia services and the many publications citing the high quality of care provided by CRNAs indicate that the role of nurse anesthesia will continue to be scrutinized and refined (Catchpole, 1991; Jordan, 1994; Mezy, Dougherty, Wade, Mersmann 1994; and Stoll, 1988). It seems appropriate, that in future considerations regarding the role of CRNAs, that the role be defined in such a way as to utilize CRNAs to the full extent they are able to provide safe, adequate anesthesia. The literature review indicated this is not always true. With respect to any future deliberations on the CRNA's role or utilization, whether in the Indian Health Service (IHS) or nationally, it is imperative to describe the extent of the role they are now fulfilling.

This research sought to provide information on nurse anesthesia service in the IHS that was not available at the time this study was undertaken. Also, it was hoped the data would contribute to the literature describing CRNA value and capabilities. This has merit since the CRNA role is dynamic and such data may influence its future evolution. Both clinical and other professional roles for IHS CRNAs were sought. Clinical roles looked primarily at CRNA clinical autonomy and practice of regional anesthesia. These two subjects are prominent in the literature review concerning CRNA clinical practice. Other professional roles focused on responsibilities beyond the operating room (OR). Role responsibilities in this area could

involve varying degrees of clinical and non-clinical skills. For example, involvement in committees and administration may utilize clinical expertise but are non-clinical in nature. In contrast, responding to codes and performing labor epidurals are examples of direct application of clinical skills outside the perioperative environment.

Thus, it was chosen to research IHS CRNAs in order to document their numbers, service, and contribution to the unique profession of nurse anesthesia.

### Rationale and Significance of the Problem

The importance of documenting achievements and capabilities should be obvious for any profession. For nurse anesthesia, the need is perhaps greater in consideration of the well documented historical challenges to the nurse anesthetist role over its long evolution (Bankert, 1993; Gunn, 1975; Gunn, 1977; Gunn, 1991; Kelly, 1991; Stoll, 1988; and Thatcher, 1953). Bankert (1993) emphasizes the need to document in pointing to "early, precedent-setting court decisions" which cited the "undisputed record of accomplishment" documented by Alice Magraw in 1899 regarding her administration of anesthesia in over 3000 cases (p.12). In relation to Magraw's published record, Bankert continues, "it has come to represent the ultimate example of the axiom, 'publish or perish' " (p.12). The role of the nurse anesthetist has evolved over the past one hundred years. The American Association of Nurse Anesthetist (AANA) recognized a need to document the history of CRNAs in the United States and sponsored the first comprehensive history of nurse anesthetists. The result was Thatcher's *History of Anesthesia, with Emphasis on the Nurse*

*Specialist* published in 1953 (Bankert, 1993). Some 40 years later the AANA asked Bankert to update that history and in 1993 *Watchful Care: A History of America's Nurse Anesthetists*, was published. Indeed, the power of published documentation is difficult to overestimate. Concerning her research, Bankert (1994) said the following:

As I advanced in this study, I became more and more convinced that it was not only the achievement of Magraw and her colleagues at Mayo Clinic, but the fact that Magraw documented and published her work---the earliest paper appearing in 1899---that nurse anesthetists survived (p.12).

Documenting the services of CRNAs in the IHS may have similar value as well as fulfilling a specific need, since no prior research has been published concerning their service and contributions. Hamelink, McKibban, Staver, and Walker (1994) pointed out that the CRNA role "varies greatly among practice settings" (p. 182). For example, nurse anesthetists may perform "preoperative evaluations, recovery room management, postoperative follow-up, invasive monitoring, pain management, ventilator management, resuscitation, department decision making, and quality assurance activities" (p. 182). The uniqueness of the IHS itself, being tasked with responsibility for raising the health status of a relatively isolated population considered to have the worst health status of any group in the U.S. makes the study of CRNAs in this practice setting all the more interesting.

In this study, data was generated concerning the range of specific services CRNAs provide in the IHS. Also, demographic information concerning these anesthesia providers was collected. This may have applications within the IHS, be helpful to nurse

anesthetists considering IHS employment, and be of interest to CRNAs already in that agency. On a broader plane, it contributes to documenting what CRNAs do, their contributions, and capabilities. This type of data may have broad applications for the profession, ranging from educational planning to legal issues regarding practice. In addition, data from this study contributes to the literature regarding role theory as it applies to CRNA role development.

In consideration of the significance of this study, it is worth noting the great impact that the federal government has had on development of the CRNA role. This influence has come through federal efforts to provide adequate anesthesia services during war, and to under-served populations, as detailed by Bankert (1993) and Gunn (1991). Therefore, it seems evident that the continuing evolution of the nurse anesthetist's role could potentially be influenced by unique practice settings such as the IHS. Of course, without documented knowledge of what services nurse anesthetists were providing in the IHS, that probability was remote.

#### Background of the Problem

As was previously noted, CRNAs, commonly known as nurse anesthetists, have had a significant role in anesthesia delivery for over 100 years. Today they number approximately 25,000 and administer nearly 65 percent of the total anesthetics given each year in the United States (Jordan, 1994).

Furthermore, populations in rural areas and inner cities rely mainly on CRNAs for obtaining anesthesia services, and manpower demands remain high (Bennet, 1984; Gunn, 1991; Lee and O'Neal,

1994; Mannino, 1994; Rosenbach, 1990; and Rosenbach, Cromwell, Pope, Butrica, Pitcher 1991). According to Jordan (1991) the demand for CRNAs has remained high due to such factors as: an aging U.S. population, complex procedures requiring two or more anesthesia providers, expansion of services for obstetrics and pain management, and specialty surgery centers. In addition, Jordan (1994) and Rosenbach et al. (1991) point out that CRNAs are seen as a way to moderate the high cost of health care. Healey (1994) states that services by nurse anesthetists are about one third the cost of anesthesiologists. In fact, Rosenbach et al. (1991), based on their examination of data from the Health Economics Research study done in 1990, estimated a potential \$1.2 billion potential savings a year through increased use of CRNAs in anesthesia care. Anders (1995), citing a recent survey by Abt Associates of Bethesda, MD, "noted that for many procedures, nurses could be used in place of - - - doctors" (p. 1). In the most nurse-intensive scenario, Abt concluded, "the U.S. already has twice as many doctors in anesthesia as it needs" (p. 1).

In light of the above facts, it is surprising that the public and even many in the health care industry know so little about the profession of nurse anesthesia, its history, or its economic advantages (Bankert, 1993; Mannino, 1994). To illustrate the relative obscurity of the profession, Bankert (1993) called attention to an article in a national news publication referring to nurse anesthetists as "the best kept secret in medicine" (p.15). Unfortunately, Keys (1945) failed to document the first modern group to specialize in anesthesia in his "*history of surgical anesthesia*". Though, he did claim to chronicle a history of anesthesia starting from when "the Lord God caused a deep sleep to fall upon Adam" and removed one of his ribs as told in Genesis

2:21. However, nurse anesthetist's role as the first modern group specializing in anesthesia was powerfully documented in 1953 by Thatcher in her *History of Anesthesia; with Emphasis on the Nurse Specialist*. In 1994, acknowledging a still pervasive lack of knowledge and recognition concerning nurse anesthetists, Mannino admonished the profession not to allow complacency regarding its role in the health care market.

Although a sizable body of literature concerning nurse anesthetists exists, little could be found that specifically focused on CRNA roles. Lester and Thomson (1989b) identified a lack of documentation on the full spectrum of CRNA roles, and voiced a need to define such roles. By answering such questions as; how prevalent is the administration of regional anesthesia among CRNAs? What percentage of CRNAs are involved in administrative duties, committees, staff education, and resuscitative teams? Hamelink, McKibba, Staver, and Walker (1994) recognized that the scope of practice and potential roles for CRNAs varied greatly in different practice settings. For example, with reference to roles, service in the Armed Forces could be contrasted with practice in a health maintenance organization; each offers a unique expression of the CRNA role.

The Indian Health Service (IHS) is an unique setting for CRNAs. Yet, their contributions to this agency remain undocumented. In fact, even the number of CRNAs practicing in the IHS was not known.

The IHS is unique in being specifically tasked with responsibility to raise the health status of American Indians and Alaska Natives who arguably have the worst health of any U.S. population (U.S. Department of Health and Human Services [DHHS], 1994a). The IHS is one of eight agencies in the U.S. Public

Health Service. The DHHS (1994b) estimates that its service population will be approximately 1.37 million by 1995. It further states that this population is comprised of 500 federally recognized tribes dwelling primarily in 32 states.

As of October 1, 1993, the IHS operated 41 hospitals, 66 health centers, 4 school health centers, and 44 health stations (DHHS, 1994b). IHS hospitals are generally small and serve predominantly rural communities on reservations in the following states: Alaska, Montana, South Dakota, Oklahoma, New Mexico, and Arizona (DHHS, 1994a).

#### *Research Questions*

1. How many CRNAs does the Indian Health Service (IHS) currently employ?
2. What percentage of IHS CRNAs have an Anesthesiologist available at their site.
3. To what extent do IHS CRNAs practice regional anesthesia?
4. To what degree are Indian Health Service (IHS) CRNAs serving in non-clinical roles?

#### *Conceptual Framework*

Certainly educational preparation will be a factor in defining the CRNA role of the future. In considering the maturation process of the nurse anesthesia role, concepts of role theory may be applied. Various definitions and theories on the concept of role have been advanced (Biddle, 1979; Elliot, 1972). Biddle (1979) described Role Theory as "a science concerned with the study of behaviors that are characteristic of persons within

contexts and with various processes that presumably produce, explain, or are affected by those behaviors" (p. 4). In applying this definition to the CRNA role, the administering of anesthesia for surgery and related duties is the context in which the role is manifest. The processes producing behaviors associated with the role may include socialization, education and patient need. Processes that explain behavior can in fact be those processes that identify links between actions and environment. The processes that are most importantly affected by the behaviors of CRNAs is patient health and well being.

In 1979, Bullough asserted expanding technology drives role expansion. The behaviors characteristic of the nurse anesthetist's role have continued to expand to meet not only growing technology, but also to meet anesthesia demand. Technology and need has in turn influenced the educational preparation and role of CRNAs. Education and training foster required role behaviors.

However, the behaviors expected or associated with a particular profession or group may or may not be well known within a society (Biddle, 1979). Certain behaviors usually become identified with a certain role and help society recognize it; for example, the physician's behavior of wearing a white coat and being identified as a physician. A physician so recognized, may then be identified while performing other behaviors associated with his role (Biddle, 1979).

Unfortunately, CRNAs typically working in the OR have little visibility and hence public recognition of their role. And when they are visible, they may be taken for a physician. For example, during preoperative assessments, there is nothing obvious to distinguish a nurse anesthetist from an anesthesiologist. Further,

the nature of anesthesia precludes very little first hand knowledge of the CRNA role by the patient. Perhaps the involvement of CRNAs in non-clinical roles, such as hospital committees and professional organizations will provide a better means to publicize the role of nurse anesthetists. Also, regional anesthesia offers a great opportunity to work with patients in a more conscious state and provides a service that can make a great impact on a patient's concept of the CRNA role. In conclusion, the concept of role theory may be applied to the CRNA role and its continued maturation. The results of this study contribute to the recognition of behaviors associated with the CRNA role and help define those behaviors in the context of Indian Health Service practice settings.

#### *Definitions*

Autonomy refers to the level of independence a CRNA has in decision making regarding clinical practice, and relates to the issue of supervision of nurse anesthetists by physician anesthetists. See "supervision of CRNAs" below.

Availability of an anesthesiologist at IHS sites only indicates that a particular site utilizes such a provider. It may also be inferred that a possibility for collaboration with or supervision of CRNAs by the anesthesiologist at such sites exist.

Certified Registered Nurse Anesthetist (CRNA) denotes a registered nurse (RN) who has received advanced training in anesthesia care and is legally qualified to administer anesthesia. In order to become a CRNA, a RN must graduate from an accredited

Nurse Anesthesia program, pass the national certification exam, and recertify every two years. The terms CRNA and nurse anesthetist may be used interchangeably.

Clinical roles include responsibilities performed in the perioperative period, such as administering anesthesia and pre- and post anesthesia care. These roles also include any other function that involves direct application of clinical skills, such as service to labor and delivery, and airway management on special units and during code situations.

Non-clinical roles for CRNAs may include roles in hospital administration, committees, staff education, professional research and publishing, and activities in professional organizations.

Physician anesthetist is a physician who administers anesthesia. An anesthesiologist is generally considered a physician with advanced training in anesthesia care. Although the term anesthesiologist may also be applied to a CRNA, the terms physician anesthetist and anesthesiologist will be used interchangeably to denote a medically prepared anesthesia provider.

Role as defined by Merriam-Webster's (1993) may be a function performed in a particular operation or process. Biddle (1979, p.83) refers to role as "those behaviors characteristic of one or more persons in a context." For the purposes of this study, role will refer to those behaviors characteristic of CRNAs in the context of the IHS sites where they practice. However, the term *role* may be utilized in two variations. First, to refer to the

whole set or synthesis of behaviors or functions associated with or performed in the course of one's practice as a CRNA. Second, it may also be applied to a particular sub-set of behaviors associated with one particular facet of the whole. For example, the set of behaviors associated with certain administrative duties may be labeled as a manager role, while the aggregate of all roles will be known as the CRNA role in a general sense. The distinction between the two applications should be clear from the context in which they are used.

Supervision of CRNAs by physician anesthetists is best understood by realizing that there are many degrees of supervision possible. A continuum exists, ranging from complete autonomy without physician anesthetist supervision to formal supervision with the presence of an anesthesiologist perhaps required during induction and emergence. For example, some CRNAs work under the supervision of an anesthesiologist who has prerogative to review and alter anesthesia management. Yet other CRNAs may not collaborate or even work in institutions using physician anesthesia providers. Still other nurses anesthetists and physician anesthetists work in collegial relationships. Obviously, if a CRNA is the sole provider at a particular site, a much greater degree of autonomy must exist. Notwithstanding, it should be realized that there are probably no anesthesia providers that practice in a vacuum. They may consult with each other and other health care providers as prudence would indicate.

The subject of supervision is further complicated by variance in laws and legal interpretations concerning CRNA practice. For example, in some states "the sole precondition to the performance of anesthesia services by CRNAs is the 'ordering' of anesthesia by

a physician, dentist, or podiatrist whose scope so allows" (Recht and Breuner, 1993, p. 121). However, "many states require that CRNAs be 'supervised' by a 'licensed physician.' No state, however, specifically requires in either its nurse practice act or board of nursing regulations that the supervising physician be an anesthesiologist" (Tobin, 1994, p.58). It is significant to note therefore, that CRNAs can legally practice as sole anesthesia providers in all 50 states. The mention of supervision by a "licensed physician" such as a surgeon is a different issue than supervision of CRNAs by anesthesiologists. For example, Eskreis (1985), in the Whittier Law Review, noted that "often the nurse anesthetist must make critical decisions when supervised by a physician with little or no anesthesia training" (p. 862). And Blumenreich (1991) referencing this same topic noted that "one can certainly be 'supervised' by someone who knows less than the person supervised" (p. 196). Therefore, when a CRNA is the sole anesthesia provider, the surgeon, dentist, or podiatrist must rely on the CRNA's clinical expertise in anesthesia. The word "supervision" in such cases obviously does not retain its typical meaning and may be seen as a formalized line of authority more than anything else.

Some anesthesiologists however, have maintained that CRNAs are not qualified to be sole anesthesia providers and should always be supervised by anesthesiologists (Foster, 1991; Tobin, 1994; Wolf, 1991). In addition, attempts have been made to hold providers such as surgeons liable for potential acts of negligence by CRNAs they "supervise". Eskreis (1985) reviewed such court cases and decisions involving a number of legal doctrines. She noted that although such doctrines as "captain of the ship" had been applied to surgeons liability for anesthesia negligence, such

doctrines did not bring success. She further summarized that "it is inequitable to hold a physician, who exercises little or no control over the specialist's actions, liable for a practice about which he is expected to know less than the actual health care provider" (p. 871-872).

Thus, the issue of CRNA autonomy revolves around supervision by anesthesiologists. A CRNA generally makes autonomous clinical decisions when working under the supervision of a surgeon, but may not when directly supervised by an anesthesiologist. Therefore, for this study, supervision of CRNAs by anesthesiologists was the variable used in considering CRNA autonomy. However, asking whether nurse anesthetists are supervised by physician anesthetists cannot be answered accurately with a simple yes or no. There are multiple gradations in the continuum of supervisory relationships. Potential evaluation of these relationships could ascertain whether anesthesiologists are required to be present during inductions, direct complex cases, or simply review care plans. However, it appeared to the author that a simpler and more definitive way of indicating CRNA autonomy might be appropriate for this study. It seemed clear that if a CRNA practiced without an anesthesiologist physically available at their clinical site, their level of autonomy must be near the independent end of the continuum. This is not to say CRNAs cannot practice relatively autonomously in collaborative practice with anesthesiologists. But for this study, the presence or absence of an anesthesiologist was used as the only indicator of CRNA autonomy.

### *Limitations*

This study attempted to survey the entire population in question. It was limited by the percentage of that population responding and usable responses. This study did not attempt to examine IHS CRNA/Anesthesiologist relationships and cannot give information on CRNA autonomy as it may relate to collaboration between these providers.

### Summary and Overview

This chapter highlighted the importance of the nurse anesthetist in meeting the demand for anesthesia services. However, notwithstanding a major role in providing anesthesia for over a 100 years, CRNAs are relatively unknown and their role is often poorly understood even by health care professionals. The IHS is a unique practice setting employing CRNAs in predominately isolated areas on Indian reservations. Although the approximate number of nurse anesthetists in the IHS was known, no previous study or documentation concerning their service in the IHS had been published. The fact that nurse anesthetists have a major role in anesthesia delivery today was attributed to historical documentation by early CRNAs such as Alice Magraw. Current CRNA leaders have emphasized the continued need to document and publicize the CRNA role. This study focused on the roles and contributions of CRNAs in the IHS.

## CHAPTER TWO

### REVIEW OF THE LITERATURE

In this chapter the literature concerning CRNA roles not directly associated with clinical practice is first reviewed. Studies documenting the scope of CRNA clinical practice is then presented. A number of areas concerning CRNA scope of practice have received special emphasis in the literature. These include the issue of direct supervision of nurse anesthetists by physician anesthetists, and the practice of regional anesthesia. These areas will receive special focus in the review. A review of the concepts of role theory as they relate to CRNA role development and summary of pertinent studies concludes the chapter.

Although, the American Association of Nurse Anesthetists (AANA) has conducted a number of surveys of anesthesia service over the years, these have focused largely on percentages of total anesthetics administered by various providers (Mohler, Biggins, and Kaiser, 1965; Biggins, Bakutis, Nelson, Petraitis, 1971). Very little has been published concerning CRNA roles not directly associated with clinical practice, such as roles stemming from management, staff education, and research.

In their 1989 studies, Lester and Thomson looked at practice profiles and role perceptions of CRNAs. They asserted that "the roles filled by this health care provider have not been identified and reported" (p. 418). Their study focused on the perceptions of roles for CRNAs as held by CRNAs and physician anesthetists. However, they did not gather data on involvement in specific roles.

In 1975 an extensive survey of nurse anesthetists was undertaken by Health Information Services Inc. at the request of

the AANA. The report offered a profile of nurse anesthetists based on five areas: general characteristics, employment setting, academic background, areas of responsibility, and types of procedures performed. The "areas of responsibility" included CRNA involvement on hospital committees. Involvement on the following committees was identified: utilization, mortality, infection, disaster, and safety. And, a total of "33 percent of all respondents" were found to "actively participate in one or more hospital committees" (p. 595).

More recently, Waugaman (1994) and Foster (1994) encouraged nurse anesthetists to assume roles in areas such as seminar providers, education and training, administration, research, publishing, product evaluation, and leadership in professional organizations. In their report on CRNA employment options, Hamelink et al. (1994) also recognized nonclinical positions for CRNAs. Other studies have served to accentuate the need for CRNA roles in research, education, and administration (Catchpole, 1991; McKibban, 1991; Ross, 1994; Temo, 1994; and Van Wormer, 1994).

Unlike non-clinical responsibilities, the literature concerning CRNA scope of practice is extensive; it has been debated and written about for many decades. Stoll (1988) points out that the first goal of the National Association of Nurse Anesthetists (NANA) in 1933 was to "define the scope of practice for nurse anesthetists" (p. 180). Early articles such as those by Doane in 1938 debated what an anesthetist should be. And Hedden (1938) gave his view on "the place of the anesthetist" (p.59). The work of Bankert (1993) and Thatcher (1953) in chronicling the history of nurse anesthetists documented the controversy as to the scope of nurse anesthesia practice.

Jordan (1994) outlined a board range of current clinical functions, privileges, and responsibilities in relation to nurse

anesthetist's scope of practice. The range of practice included all types of anesthesia techniques, pre- and post-operative care, and clinical support functions. Catchpole (1991) also asserts that CRNA practice "encompasses all the areas and practices that are considered anesthesia-related" (p.135). For example, the range of nurse anesthetist's practice spans from regional techniques to open heart and neuroanesthesia (Hamelink et. al. 1994).

That CRNAs and physician anesthesiologists share over-lapping functions has been well documented (Eskreis, 1985; Kelly, 1991; Recht and Breuner, 1993; Serafin, 1979; and Tobin, 1994). Although "there is little uniformity concerning how states regulate nurse anesthetist scope of practice --- every state permits nurse anesthetists to administer local, regional, and general anesthesia" (Tobin, 1994, p. 66). For example, Recht and Breuner stated that under the California Nursing Practice Act, CRNAs may lawfully "perform functions that fall within the independent scope of nursing practice, regardless of whether the functions equally may be performed by physicians and thus be viewed, when performed by physicians, as medical acts" (p. 120). They further point out that "the sole precondition to the performance of anesthesia services by CRNAs is the 'ordering' of anesthesia by physician, dentist, or podiatrist whose scope so allows" (p.121). The failure to mention a physician anesthetist to "supervise" or oversee the nurse anesthetist, in this statement, is a notable absence for those who are still debating whether CRNAs should be allowed to be sole providers of anesthesia.

In the Whittier Law Review (1985) discussing the expanded practiced of nurse anesthetists, Eskreis noted that often CRNAs are "supervised" by physicians with no expertise in anesthesia and

make independent critical life and death decisions for the patient. Such supervision, of course, is referring to cases where CRNAs are the sole anesthesia provider although technically working under a surgeon. This scenario is at one end of the continuum of CRNA autonomy.

Gunn, in 1991 maintained that a third of the hospitals in the United States were solely dependent upon CRNAs for their anesthesia services. And Martino (1990), referring to Air Force CRNAs stated, "it is not unusual for the CRNAs in these small departments to find themselves practicing alone for weeks at a time" (p. 62). Based on the 1992 AANA membership survey, nurse anesthetists are the sole providers of anesthesia in 85 percent of rural hospitals (Jordan, 1994). Beutler (1988) cited the AANA in reporting that "20 percent of all CRNA administered anesthetics are provided without the collaboration of an anesthesiologist" (p. 28). Based on this data and the historical documentation concerning CRNA practice, nurse anesthetists have experience administering anesthetics for over 100 years without the collaboration of anesthesiologists .

From the above statistics it seems evident that many rural nurse anesthetists practice with a high degree of autonomy. Martinson (1994) stated "CRNAs in small towns have a variety of duties and wear many hats" (p. 64). It is known that there is a great void in meeting the health care needs of American rural and special populations (Shurpin, 1994). In relation to CRNA service in such environments, Martinson (1994) published two cases dramatically illustrating CRNA scope of practice and autonomy.

In case number one, Martinson, a CRNA, was responsible for transporting a 300lb Native American female to a more specialized medical facility 240 miles away. She was a 6-day post caesarean section, who had hemorrhaged substantially and developed micro

emboli. She had also eviscerated, was in renal shutdown, and was intubated and ventilated. He arranged for an ambulance, equipment, and a snow plow to lead the way since a severe blizzard was also in progress. Upon arriving for pickup, the patient extubated herself and quickly became dyspneic and cyanotic. The facility was unable to find the necessary equipment for intubation and Martinson gave mouth to mouth resuscitation until his medical equipment could be retrieved from the ambulance and then re-intubated her. The trip was completed without further incident and the patient was transferred into the receiving intensive care unit.

In the second case, Martinson was alerted about a patient who had sustained a gunshot wound coming to the emergency room. Martinson arrived about the same time as the ambulance. The patient had sustained a 12-gauge shotgun wound to the anterior/lateral left chest and left antecubital area. His color was ashen gray and blood pressure was 30/0, heart rate 130, with slow ineffective respirations. Martinson intubated and ventilated the patient, who was then transported to the OR where "two large rubber shod clamps were clamped on the bleeding lung remnants. The chest was suctioned, repacked, and the patient was readied for air shipment to a larger trauma center" (p.64). During the 75-minute flight that followed, Martinson was responsible for the patient, and maintained his ventilations via Ambu bag. The patient was transferred to the receiving hospital's OR with stable vital signs and "able to blink his eyes on command" (p. 64). It seems that the CRNA role has expanded, flourished, and developed under conditions of necessity.

Military nurse anesthetists have also distinguished themselves in situations requiring high degrees of independence. During times of war, CRNAs have often worked alone under austere

and intense conditions to provide anesthesia. The broad scope and often heroic proportions of nurse anesthetist's service during wartime has been powerfully documented by Bankert in 1993.

However, while the abilities and quality of their care is well known to some, the right of CRNAs to practice without an anesthesiologist's direct supervision has not gone unchallenged. The tumultuous history of the CRNA role was cited earlier. Modern literature continues to report artificial barriers which threaten the professional role of nurse anesthetists (Beutler, 1988). In 1991 Foster said, "for several years now, the American Society of Anesthesiologists ASA has maintained that anesthesiology is the practice of medicine from which nurse anesthetists should be excluded" (p. 113). And, notwithstanding the legality of CRNA practice independent of an anesthesiologist, institutional policies sometimes limit CRNAs from performing all functions allowed by law, such as regional anesthesia (Tobin, 1994). In 1991 Wolf stated, "too often irrational restrictions are placed on CRNA practice under the guise of the team approach" (p. 117). Concerning the "team approach" it has been reported that approximately 75 percent of all physician anesthetists supervise and bill for CRNA services (Beutler, 1988).

The cost effectiveness and quality of CRNA services was introduced previously, but it would seem some of that benefit is lost when physician anesthetists also bill for CRNA services. Beutler (1988) described how anesthesiologist's billing for supervision of CRNAs can result in exorbitant physician salaries, with the cost being passed on to the consumer. Foster (1991) argued, "the public cannot afford 'layered care' involving multiprofessionals who do not have a credible and justifiable reason for receiving payment for services rendered" (p.114).

The practice of regional anesthesia "is preferred for many

patients in a variety of surgical and obstetrical procedures" (Horton, 1993, p. 497). Referring to regional anesthesia, Gerbasi (1992) states it "offers the patient a safe and effective alternative to general anesthesia for certain types of surgical and diagnostic procedures. It provides a relatively pain-free state without necessitating a loss of consciousness" (p. 273). Furthermore, it has been reported that both anesthesiologists and CRNAs personally prefer regional techniques (Horton, 1993).

However, there is "evidence that some anesthesiologists oppose CRNAs administering regional anesthesia" (Horton, 1993, p.498). Aker and Rupp (1994) in referring to the idea of imposing restraints on CRNA practice with respect to regional anesthesia, stated that such restraints "may be inimical to the health of the community" (p.107). They also pointed out, "no statutory or regulatory preclusions for administration of regional anesthesia by CRNAs currently exist in the United States" (p. 107). Since the practice is legal, attempts at restricting it through institutional policies as cited above may be challenged. For example, one hospital's failure to allow CRNAs to provide regional anesthesia became a key point in a suit involving an injured newborn. It was determined that restricting the CRNAs practice was based on political reasons and resulted in a break in anesthesia service that could have prevented the injury (Blumenreich, 1990). Legal interpretations have also threatened to create barriers for CRNA practice of regional anesthesia. Blumenreich (1994) cited the 1977 California Attorney General's opinion that CRNAs could legally only administer general anesthesia and not regional techniques. This opinion was subsequently reversed in 1984.

The official position of the American Association of Nurse Anesthetists (AANA) is that "regional anesthesia can be

administered by a CRNA who has received education and training in the administration of regional anesthetics" (Aker and Rupp, 1994, p. 106). Currently, CRNA educational programs are not required to teach regional anesthesia, but are strongly encouraged to do so (Horton, 1993). However, for some time momentum has been growing to make instruction in regional anesthesia mandatory in nurse anesthesia education (Horton, 1993; Mannino, 1994; and Welty and Murray, 1993). Horton's report (1993) on the Council on Accreditation 1993 survey of CRNA programs showed that "almost all 92 accredited nurse anesthesia programs offered students experiences in administering at least some type of regional anesthesia" (p. 499). In 1994 Mannino stated that "our profession is rapidly being divided between those who do and those who do not administer regional anesthesia. A 'full service' practitioner will be the anesthetist of the future" (p. 134). Training in regional anesthesia will indeed be mandatory by the year 2000. Still, it should be realized that a great diversity of skill and experience exists for all anesthesia providers. For example, probably no one performs all types of regional blocks (Aker and Rupp, 1994).

Gunn (1975; 1991) has documented the evolution of nurse anesthesia education and the current trend towards post graduate and more doctorally prepared CRNAs. All nurse anesthesia education is projected to be in a graduate degree framework by 1998. Such an educational foundation is in keeping with the AANA aim of preparing independent anesthesia practitioners.

#### *Summary of Literature Review*

In review, there are many factors which may influence the CRNA role, its scope, and degree of autonomy for the future.

Mannino (1994) listed a strong professional organization, sound educational standards, and judicial and legislative victories as factors cementing the role of CRNAs as anesthesia providers in the United States. Regardless of these factors, the CRNA role is not well known and major areas concerning that role are still being debated. In the previous chapter, the need to document the current role was highlighted. This chapter reviewed literature illustrating that a range of non-clinical functions may be associated with CRNA services. It also reviewed literature on current scope of practice, some of which placed special emphasis on the issues of regional anesthesia and supervision.

In chapter three, the methodology used for investigating the various roles performed by Indian Health Service nurse anesthetists will be discussed. By obtaining and documenting this data, it is hoped that CRNA service and value to the IHS will be better understood. The literature reviewed will assist this study by providing a background on current issues surrounding CRNA practice and a context in which to interpret the results.

## CHAPTER THREE

### METHODOLOGY

#### Setting of the Study

The CRNA population for this study resided in the following states: Alaska, South Dakota, Montana, Oklahoma, Arizona, and New Mexico. They practiced in Indian Health Service facilities predominately in rural areas, with medical centers in Phoenix, Arizona, and Anchorage, Alaska being notable exceptions. The data was collected from December 1995 to March 1996

#### *Sample*

The population for this study was composed of all the CRNAs serving in the IHS. A complete list of CRNAs and their locations was not available from the IHS headquarters. Several factors made obtaining such a list difficult. First, CRNAs in the Indian Health Service fall into three different personnel systems which are: the Public Health Service Commissioned Corps, Federal Civil Service, and those hired through agencies as locum tenens. Second, since the IHS is divided into service areas that are administered somewhat autonomously, no other central source had information on all IHS CRNAs. And third, another complication in achieving a complete nurse anesthetist roster was the transient nature of some locum tenens positions that tend to fluctuate with acute needs. Therefore, neither a roster of, nor demographic information on IHS CRNAs was available. However, through official channels from the Indian Health Service Headquarters in Rockville, Maryland, 16 IHS hospitals equipped with operating room were identified; however, only 14 sites were currently providing

surgical services. A complete list of CRNAs (N=34) at those sites was achieved by calling directly to each of the 14 sites considered to potentially employ CRNAs.

#### *Data Collection Procedures*

Introductory letters (Appendix A) accompanied by Surveys (Appendix B) were mailed to each CRNA identified. These were sent via the anesthesia department at the sites where CRNAs were utilized. The introductory letters provided for informed consent and gave subjects a pledge of confidentiality. This was accomplished by removing any individually identifying information from returned questionnaires. In addition, all questionnaires were separated from envelopes so as not to be identified with specific sites by postage marks. Additionally, a section was provided for respondents to indicate if they wished to be provided with a summary of the research results.

#### *Instrumentation*

The instrument, a survey questionnaire was developed by the author. It was designed to provide data on the major research questions. It consisted of 31 questions divided into the three sections; Demographics, Clinical Responsibilities, and Other Professional Responsibilities. All questions could be answered by a yes or no, checking the appropriated space, or providing the information requested, such as years of service.

### *Research Design*

The design of this study was descriptive. A survey was used to collect data on the role of CRNAs in the Indian Health Service (IHS). Elements of CRNA role to be considered included: non-clinical responsibilities, regional anesthesia practice, and autonomy. Consent from the Institutional Review Boards at the Uniformed Services University of the Health Sciences was not required since the survey did not involve patients as subjects. The instrument was reviewed by content experts within the USUHS School of Nursing Anesthesia department.

### *Treatment of Data*

The data from the survey was computerized, reviewed and verified to ensure accuracy. All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS, version 6.0). The initial analysis consisted of obtaining frequencies and descriptive statistics for the 21 respondents in the data set. Correlations were obtained on specific variables within the demographic data in order to identify relationships that would help describe the sample. A simple binary index system was used to establish frequencies for each coded response based on the N of 21/of 34.

### *Summary*

In review, this was a descriptive study utilizing a questionnaire tool designed by the author. Its purpose was to collect data on IHS CRNAs concerning their practice and roles in the IHS as well as demographics. The tool was mailed directly to

each CRNA in the IHS with an informed consent letter. Descriptive analysis was done on the data obtained and reported with the demographic information.

## CHAPTER FOUR

### RESULTS

#### *Introduction*

This chapter presents the results of the data analysis of the CRNA Indian Health Service Survey. The first section provides general data describing the sample. The second section presents data answering the major research questions which are restated immediately below. This is followed by comparative analysis between commissioned corps, civil service, and locum tenen CRNAs. The chapter closes with a summary of the major findings.

#### *Restatement of Research Questions*

The primary purpose of this research was to focus on the role and contributions of CRNAs in the Indian Health Service. The first research question asked the number of CRNAs in the IHS? Several key areas were identified in the literature as having special significance in relation to CRNA practice. The three remaining major research questions were directed at providing data on these areas. They asked the following: What percentage of IHS CRNAs have an anesthesiologist available at their site? What is the extent of regional anesthesia performed by IHS CRNAs? And last, in what roles do IHS CRNAs serve outside the operating room, such as on hospital committees.

### *Data Describing the Sample*

Descriptive information is provided from the 11 demographic variables at the beginning of the survey. Of the 34 surveys sent, 21 were returned, representing 61.8 percent of the target population. The following data is from this sample of 21 participants.

The gender-specificity of the total sample was 7 (33 percent) women and 14 (67 percent) men.

The mean age of all the respondents was 44.29 years, with a range of 34 to 62 years. (see figure 1)

On the question of ethnicity, 18 (85.7 percent) described themselves as Caucasian. Only 1 individual (4.8 percent) claimed to be Native American, and 2 respondents did not answer this question.

The amount of time a CRNA has in clinical practice is a factor in considering the individual's clinical competence. The CRNAs of this sample possessed a wide range (.5 to 33 years) of experience in anesthesia, with a mean of 10.48 years. Only 8 anesthetists (38 percent) had less than 5 years experience, while 13 (62 percent) had more than 5 years as an anesthetist. (see figure 2)

The mean time working in the IHS, 10.20 years was similar to the mean time as a CRNA of 10.48 years. The range of time in the IHS was .50 years to 20.00 years. The years as a CRNA may be compared to the years in the IHS in figure 3. Note that while four CRNAs had 21+ years as a CRNA, none had greater than 16-20

### Indian Health Service CRNA Survey Participants Ranked by Age

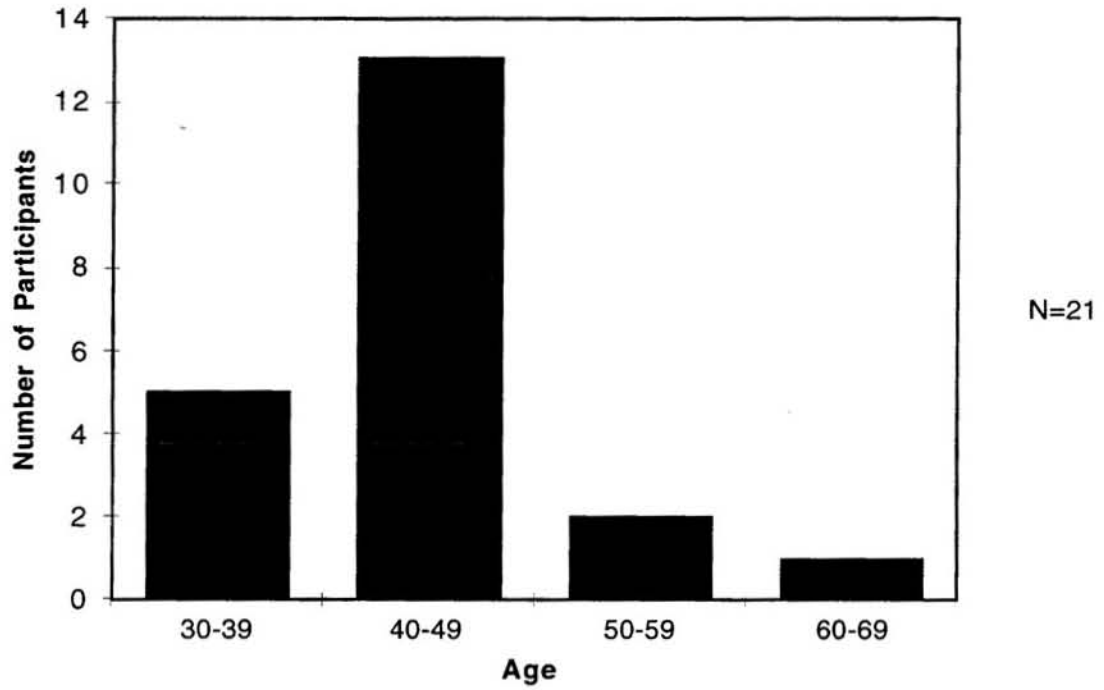
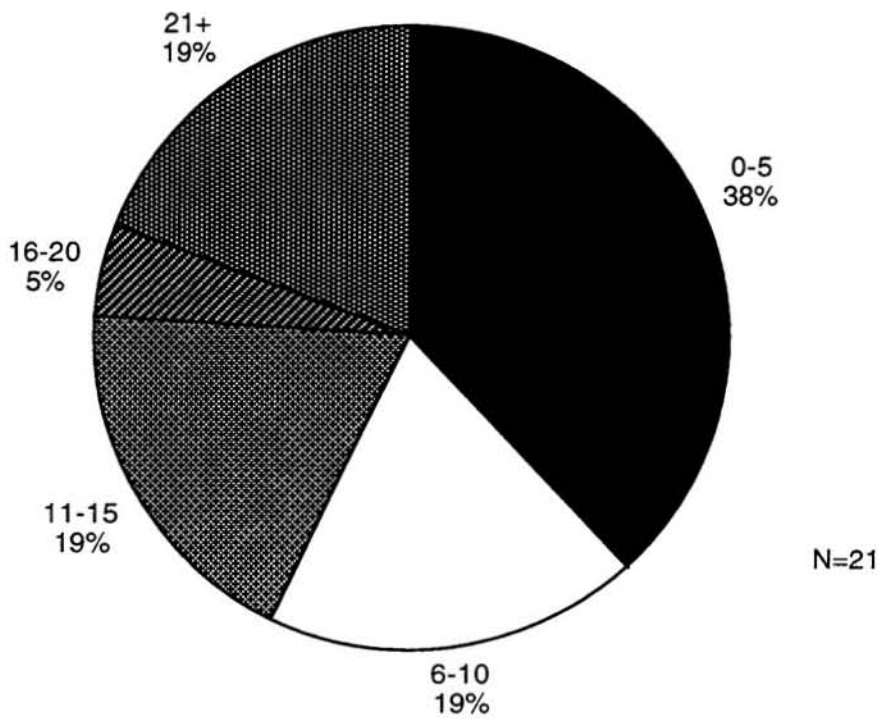


Figure 1.

**Indian Health Service CRNA Survey  
Participants Ranked by Number of Years as a CRNA**



**Figure 2.**

### Indian Health Service CRNA Survey Participants Ranked by Years as a CRNA and Years in IHS

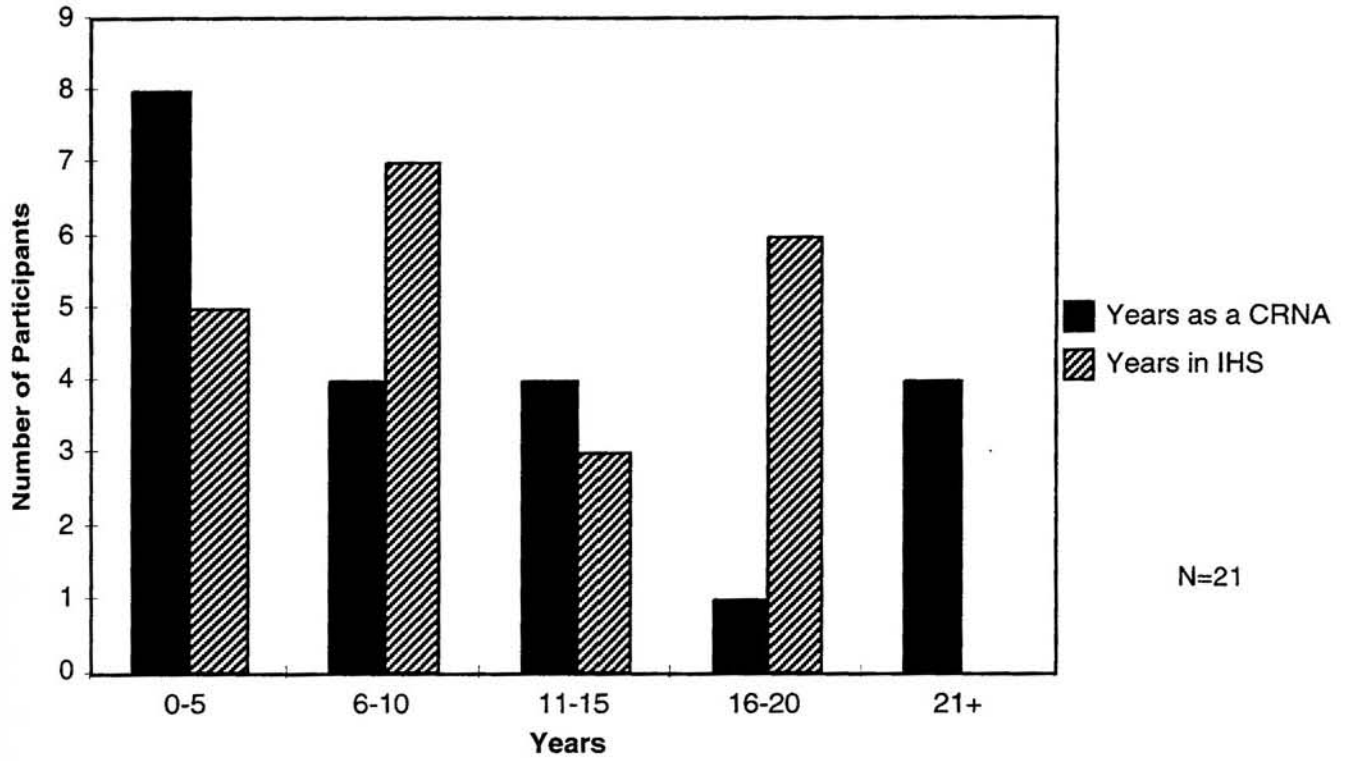


Figure 3.

years in the IHS. This may reflect the fact that commissioned corps officers are eligible for retirement at 20 years.

Sixteen CRNAs (76 percent of the sample) characterized themselves as career IHS employees. Only 4 (19 percent) responded negatively to viewing themselves as making the IHS a career. One respondent failed to answer this question. (see figure 4)

Seven CRNAs ( 33 percent of the sample) received their anesthesia training in a certificate granting framework. Only one person (4.8 percent of the sample) attended a bachelors degree nurse anesthesia program. The largest number, 13 (61.9 percent of the sample) were trained in a masters degree framework. Six members (28.6 percent) of the sample reported having additional masters degrees in areas not related to nursing. (see figure 5)

Three members of the sample stated that they are currently working on postgraduate degrees. Two were working on masters degrees. One of the two was a certificate program graduate and working towards a Master of Science in Nursing. The other did not specify his area of study. The individual in the doctoral program was advancing towards a Ph.D. in Physiology. (see figure 6)

Of the three potential personnel systems, the PHS Commissioned Corps accounted for 76 percent of the sample with 16 respondents being members. Two individuals (10 percent of the sample) were employed through the Civil Service. And, 3 (14.0 percent) were working through CRNA agencies. (see figure 7)

**Indian Health Service CRNA Survey  
Percentage of Participants Who are Career IHS Employees**

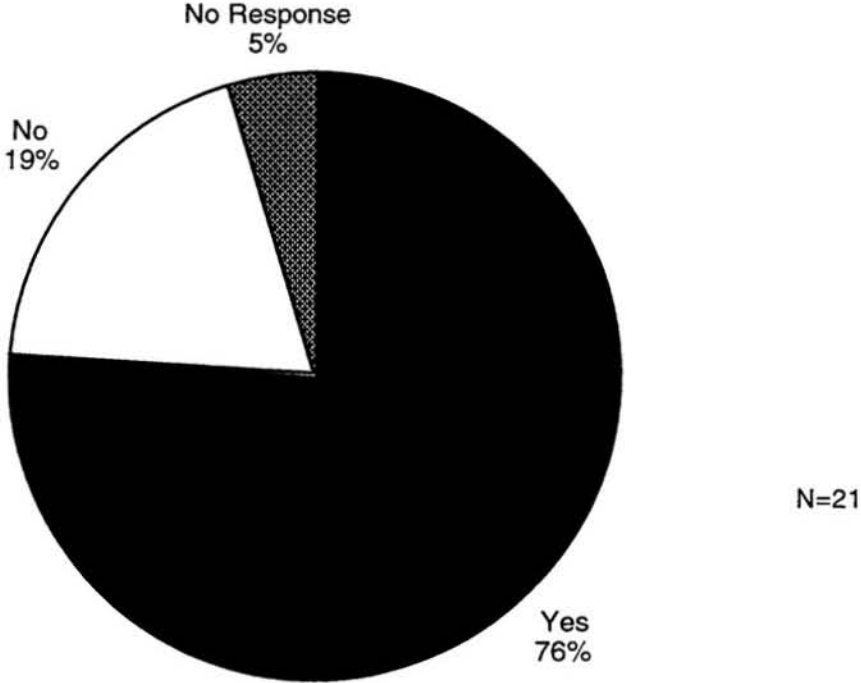


Figure 4.

**Indian Health Service CRNA Survey  
Participants Ranked by Type of CRNA Program Attended**

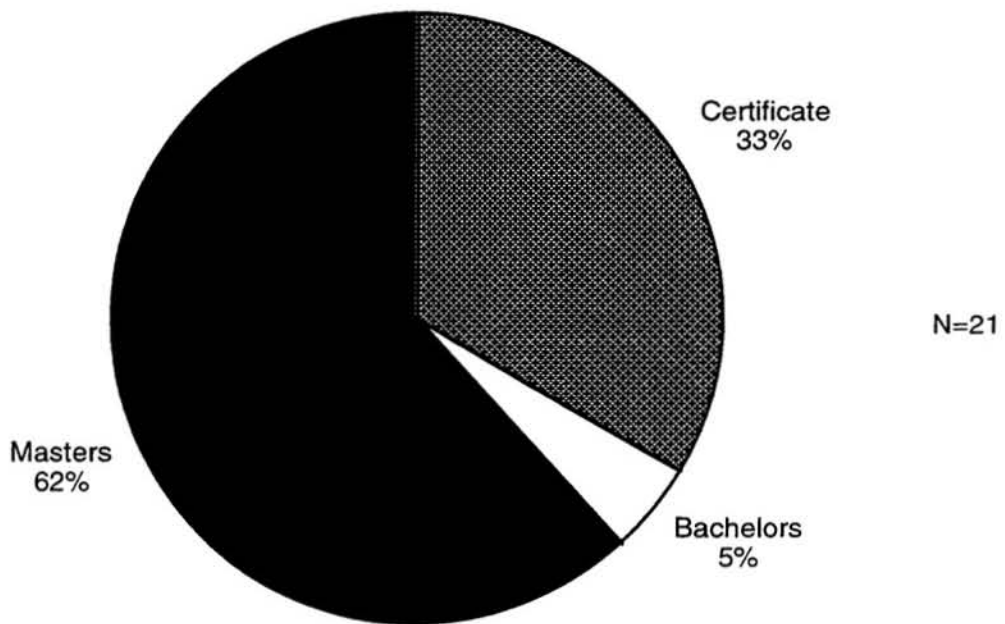


Figure 5.

**Indian Health Service CRNA Survey  
Percentage of Participants Working Towards  
an Academic or Professional Degree**

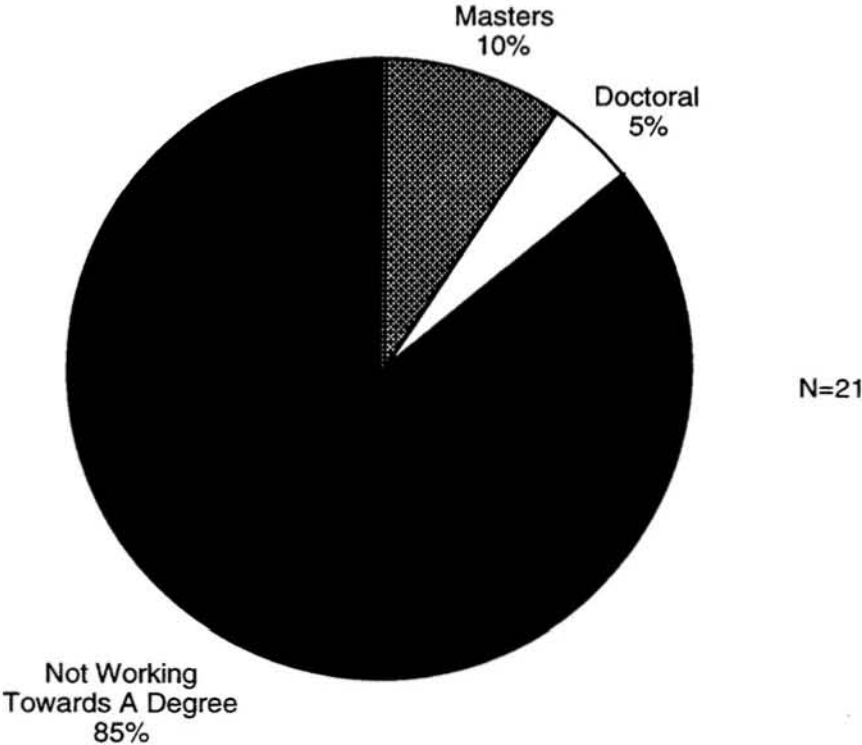


Figure 6.

### Indian Health Service CRNA Survey Participants Ranked by Type of Service

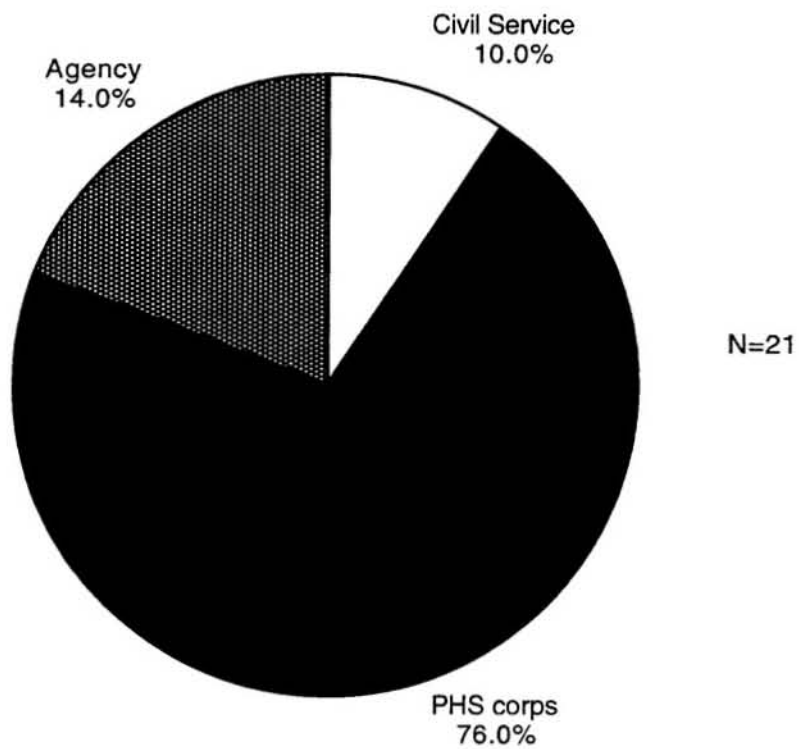


Figure 7.

*Answers to the Research Questions*

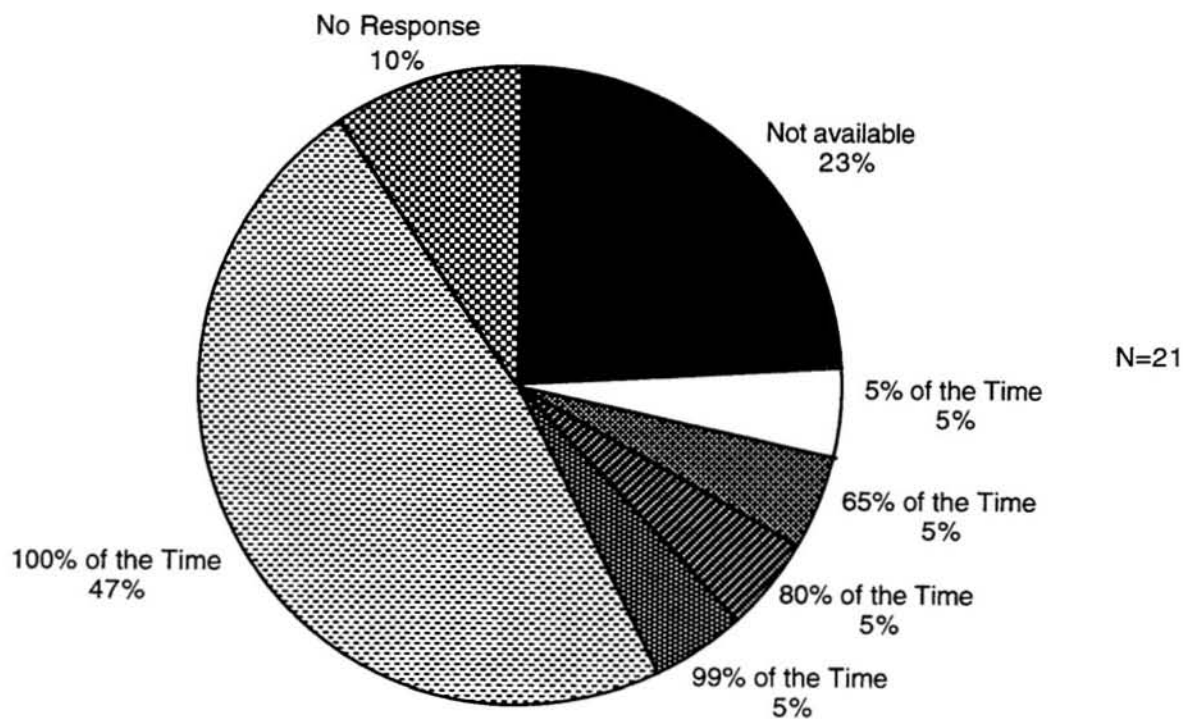
The first research question asked: How many CRNAs does the Indian Health Service (IHS) employ? As mentioned previously, a list of 20 hospitals equipped with operating rooms were obtained from the IHS headquarters. However, only 16 of those sites are actually part of the IHS. The other four are operated directly by individual tribes in the following locations: Bethel and Sitka, Alaska; Ada and Talihina, Oklahoma. These sites were not considered for this research. Each of the 16 remaining sites were contacted directly by phone in an attempt to assess their surgical service and obtain a list of CRNAs. The operating rooms at Rosebud, South Dakota, and Chinle, Arizona, were not currently functioning and had indefinite plans regarding future service. This left a total of 14 sites to consider: Anchorage, Alaska; Browning and Crow, Montana; Belcourt, and Pine Ridge, North Dakota; Claremore, Lawton, and Tahlequah, Oklahoma; Gallup, Santa Fe, and Shiprock, New Mexico; Fort Defiance, Phoenix, and Tuba City, Arizona. By contacting each site, the names of 34 individuals were obtained and each was mailed a survey. In addition to these 34, a category of more transient locum tenen CRNAs were also employed in the IHS. This is necessary because of fluctuations in demand for surgical services. Because of the frequent turnover and sometimes very short service periods of this group, they were not included in the survey. Still, the author estimates that at least an additional 2 to 6 CRNAs in this category work in the IHS at any one time. This would bring the total number of IHS CRNAs to 36 to 40 individuals.

The second research question asked: What percentage of IHS CRNAs have an anesthesiologist at their site? Sixteen ( 76.2

percent) of the CRNAs in the sample stated that there was an anesthesiologist currently at their site. Five (23.8 percent) said there was no anesthesiologist at their site. Only one of these five reported a consulting arrangement with an anesthesiologist at another site. However, this arrangement was for "peer review" every other year for two weeks. Although sixteen CRNAs reported currently having a physician anesthesiologist at their site, four said they had not over the entire previous 12 months. In the previous year, the time an anesthesiologist was available on site ranged from 0 to 100 percent of the time. Five (23.3 percent) reported an anesthesiologist was never available. One (4.8 percent) reported an anesthesiologist was available 5 percent of the time over the last 12 months. One (4.8 percent) reported an anesthesiologist was available 65 percent of the time in the preceding 12 months. One (4.8 percent) reported an anesthesiologist as available 80 percent of the time. And one (4.8 percent) said an anesthesiologist was available 99 percent of the time at their site in the previous year. Two (9.5 percent) did not respond to the percentage of time an anesthesiologist was available. The remaining 10 (47.6 percent) claimed an anesthesiologist had been available 100 percent of the time in the preceding 12 month period. (see figure 8)

The reported mean time an anesthesiologist was available at IHS sites for the sample population was 65.74 percent in the preceding year. Several nurse anesthetists noted that although their department employed an anesthesiologist they often worked evenings or call alone. It is assumed the anesthesiologist could be reached by phone in these cases. Only one respondent reported being the sole anesthesia provider for their site.

**Indian Health Service Survey  
Percentage of Time CRNAs had an  
Anesthesiologist at their Site during  
Previous 12 Months**

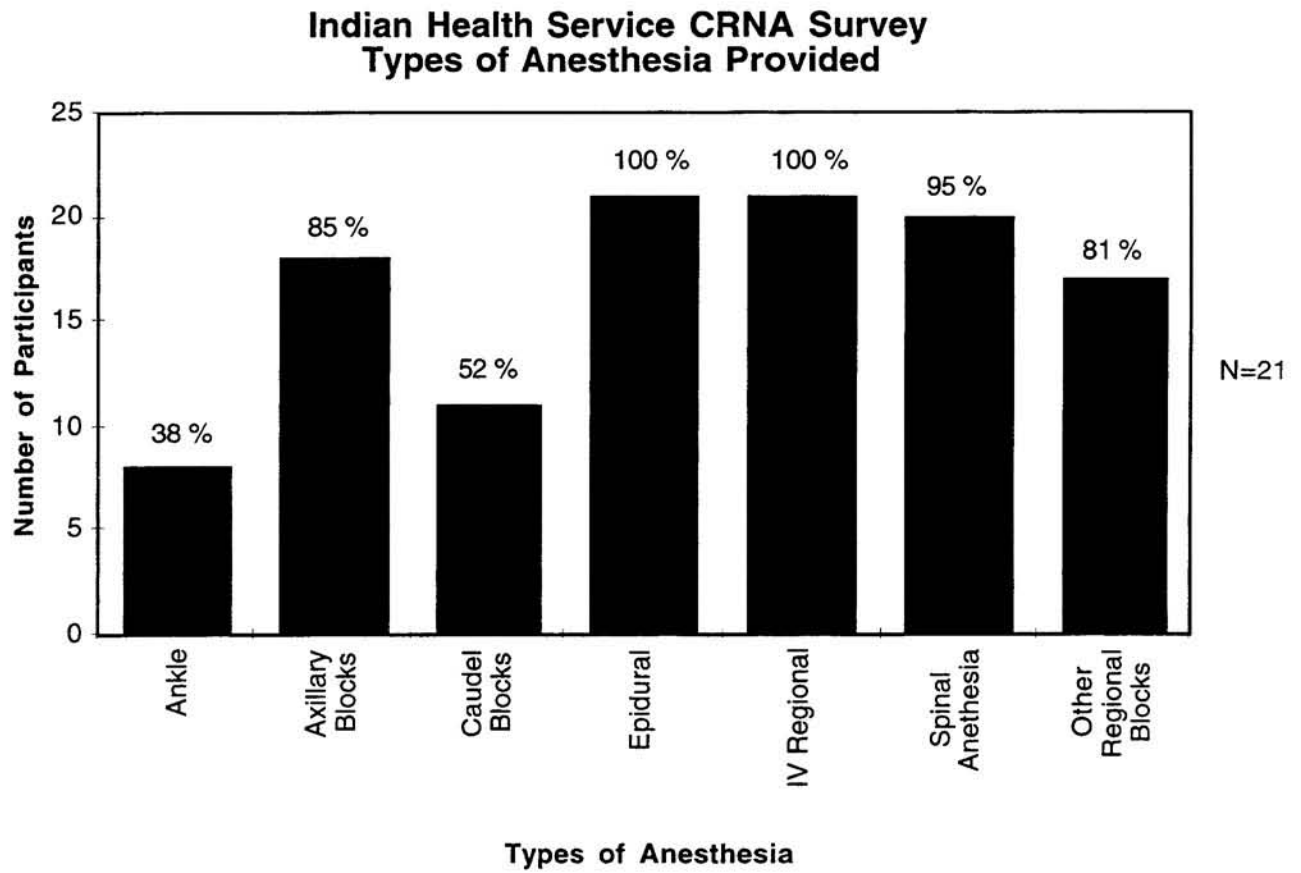


**Figure 8.**

The third research question asked: To what extent do IHS CRNAs practice regional anesthesia? Twenty (95.2 percent) CRNAs in the sample stated they perform spinal anesthesia. Twenty-one CRNAs (100 percent of the sample) reported performing epidural anesthesia. Eleven CRNAs (52.4 percent of the sample) administered caudal blocks. Twenty-one anesthetists (100 percent) said they perform IV regional anesthesia. Eighteen CRNAs (85.7 percent of the sample) reported doing axillary blocks. Eight members of the sample (38.1 percent) said they administered ankle blocks. One CRNA (4.8 percent of the sample) reported doing retrobulbar blocks. Seventeen CRNAs (81.0 percent of the sample) stated they performed other regional blocks than what was listed on the survey. (see figure 9) The other types of regional anesthesia as specifically listed included: cervical plexus blocks; interscalene brachial plexus blocks; Supraclavicular brachial plexus blocks; stellate ganglion blocks; Bier blocks; and penile blocks. One respondent did not list specific regional blocks he performed. Instead, he stated he administered a "full range of peripheral nerve and plexus anesthesia."

The fourth research question asked: To what degree are IHS CRNAs serving in roles beyond perioperative anesthesia? As was previously mentioned, such roles may still employ clinical skills or be more non-clinical nature.

On the clinical end of the spectrum, 20 CRNAs (95.2 percent of the sample) stated they responded to resuscitation codes. Fifteen anesthetists ( 71.4 percent) said they provided support to special care units such as ICU, CCU, and the ER.(see figure 10) Nineteen (90.5 percent) members of the sample stated they provided service to labor and delivery. (see figure 11)



**Figure 9.**

**Indian Health Service CRNA Survey  
Participants Who Have Special Care Unit Responsibility**

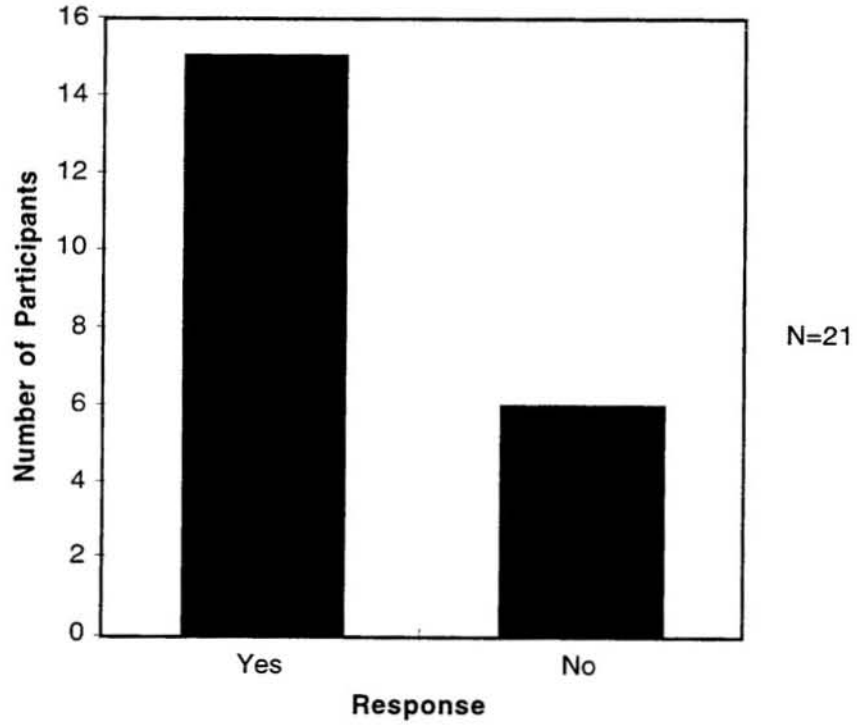
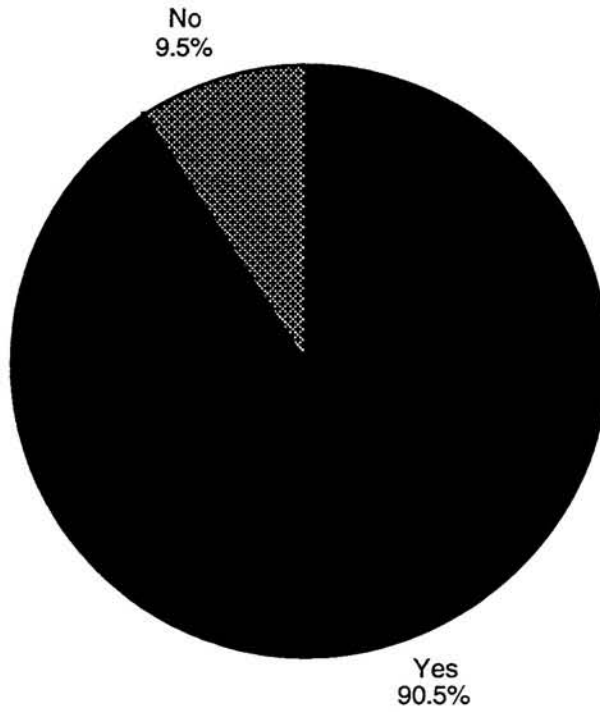


Figure 10.

**Indian Health Service CRNA Survey  
Percentage of Participants who Provide Services  
to Labor and Delivery**



N=21

Figure 11.

Thirteen CRNAs (61.9 percent of the sample) said they provided clinical expertise in other areas. (see figure 12) A wide range of services were mentioned in relation to this question. Some CRNAs mentioned furnishing airway management and IV skills hospital wide. One anesthetist said he provided acute and chronic pain management services as well as hypnosis. Another CRNA assisted in training physician anesthetists, CRNA residents, dental residents, and respiratory therapist. Still another, reported working to train paramedical/EMT personnel.

With regards to membership in military reserve units, none claimed such status. However, only the five noncommissioned corps officers would have been eligible for reserve service since the corps officers are already on active duty status. One CRNA (4.8 percent of the sample) was applying for membership on the U.S Public Health National Disaster Response Team.

IHS CRNAs were also involved in other activities indicating service beyond the operating room. Eleven members of the sample (52.4 percent) said they were members on hospital committees. Those committees included the following; Quality Assurance, Quality Improvement, Quality Management, Operating Room, Obstetrics, Equal Employment Opportunity, Critical Care, Safety, and Medical Staff. Nine CRNAs (42.9 percent) reported having administrative/managerial duties. Administrative functions included: Chairing of anesthesia department, supply acquisition, scheduling, developing policy and procedures, recruitment, supervision/management of department, and administering service excellence program. Eighteen members of the sample (85.7 percent) claimed to be active in various professional organizations. These organizations were listed as the following: American Association

**Indian Health Service CRNA Survey  
Percentage of Participants who Provide  
Other Clinical Expertise**

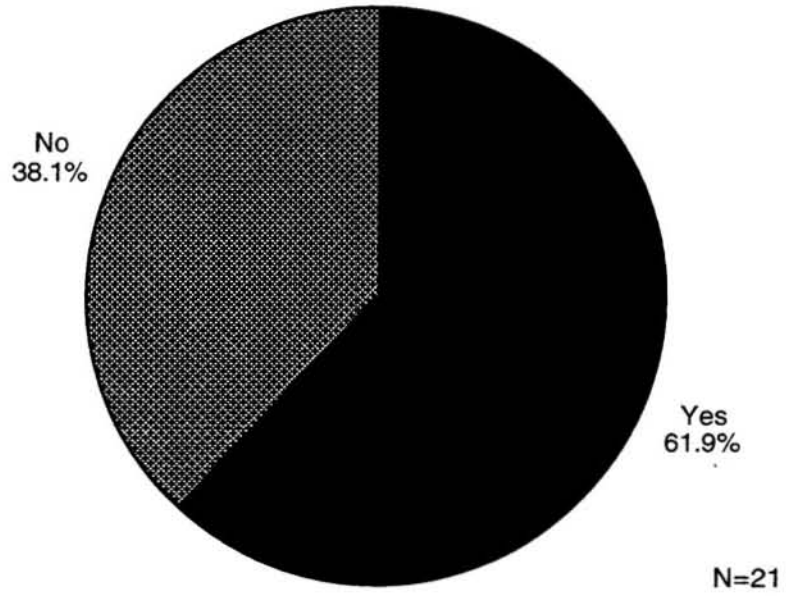


Figure 12.

of Nurse Anesthetists (AANA), state nurse anesthetists associations, Sigma Theta Tau, AANA-Federal Services Active Duty Committee, Advanced Practice Nursing Task Force, Commissioned Officers Association, Reserve Officers Association, International Anesthesia Research Society, Association of Military Surgeons of the United States, Critical Care Nurse Association, American Heart Association, American Hospital Association, and American Nurse Association. Twelve CRNAs (57.1 percent) stated they were involved in staff education. The following areas were reported with regards to instruction: inservices for surgery, anesthesia, and nursing; teaching of airway management to physicians, physician's assistants, family nurse practitioners, and emergency medical technicians; advanced cardiac life support; instructor at nurse anesthesia school; pain management; medications; drug updates, monitoring, cricothyroidotomies; difficult airway management; post anesthesia care; pediatric anesthesia; malignant hyperthermia; and patient positioning. Two CRNAs (9.5 percent of the sample) were involved in professional research. One failed to provide any information on the type of research. The other was engaged in research on 5-HT antagonist and post anesthesia nausea and vomiting. When asked if they had published any professional articles in the last two years, all 21 respondents (100 percent of the sample) said no. However, one CRNA mentioned that he had previously published in 1989. Another CRNA reported that she had been selected for publication in the AANA Journal - but that it had not been printed yet. Two anesthetists (9.5 percent of the sample) stated they had given a professional presentation in the last 12 months. One of the two had presented on reactive airway disease theory and treatment. The other CRNA did not specify the

subject of his presentation. A third CRNA said she would be presenting at the New Mexico PACU Conference in April 1996. Figure 13 gives a summary of IHS CRNA responsibilities.

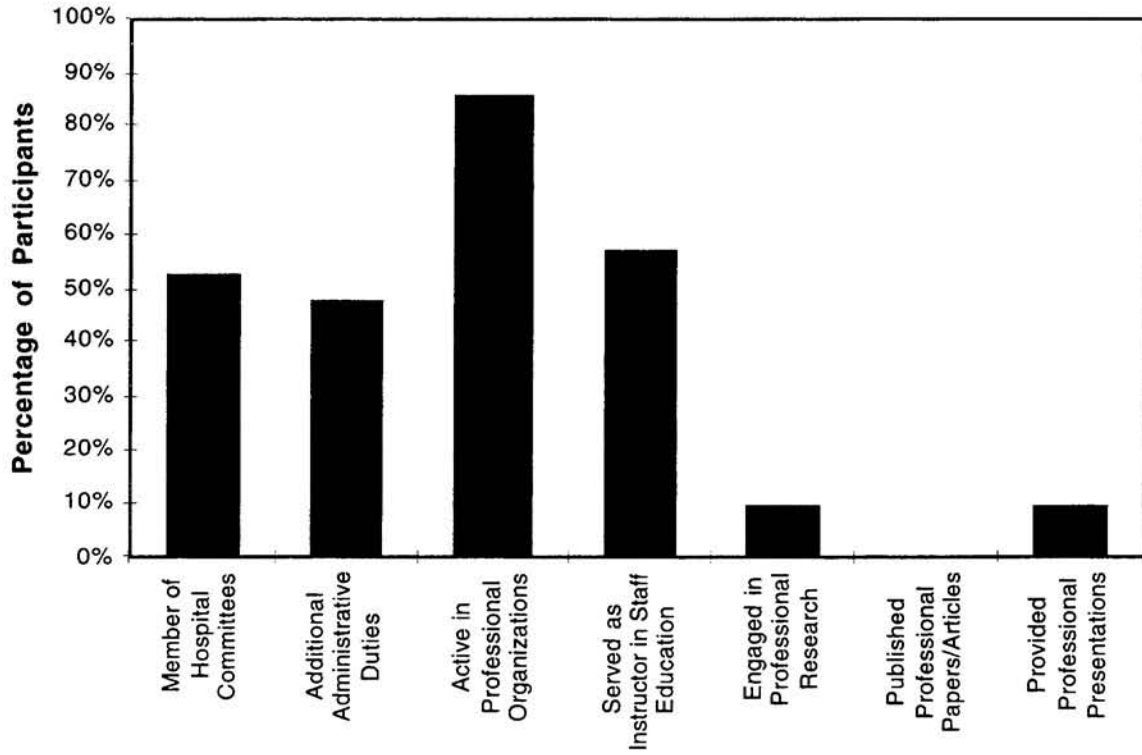
#### *Inter correlational comparisons*

Since the IHS employs CRNAs from three different organizations, comparisons between services can be made. Several areas were considered. First, CRNAs from each service were compared in terms of educational background. Second, each group was contrasted in terms of intent for a IHS career. And last, they were analyzed based on involvement in other professional activities.

In comparing the type of anesthesia training with membership in one of the three personnel systems the following was found: Thirteen (80 percent) PHS commissioned corps officers attended anesthesia programs in the masters framework, one (5 percent) went through a bachelor granting program and two (15 percent) graduated from a certificate program. Only two respondents were civil service and both were graduates of certificate programs. All three of the agency respondents also received their certification through certificate programs. (see figure 14)

However, it is not uncommon for CRNAs to hold advanced degrees in addition to their anesthesia training. All of the commissioned corps CRNAs had at least a bachelors degree. Thirteen (80 percent) had masters and three (20 percent) had bachelors degrees as their highest degree attained. Neither of the civil service CRNAs had a degree beyond their anesthesia certificate. One of the agency CRNAs (33.3 percent) had a masters

### Indian Health Service CRNA Survey Summary of Professional Responsibilities



N=21

Figure 13.

### Indian Health Service CRNA Survey Type of CRNA Certification Grouped by Service

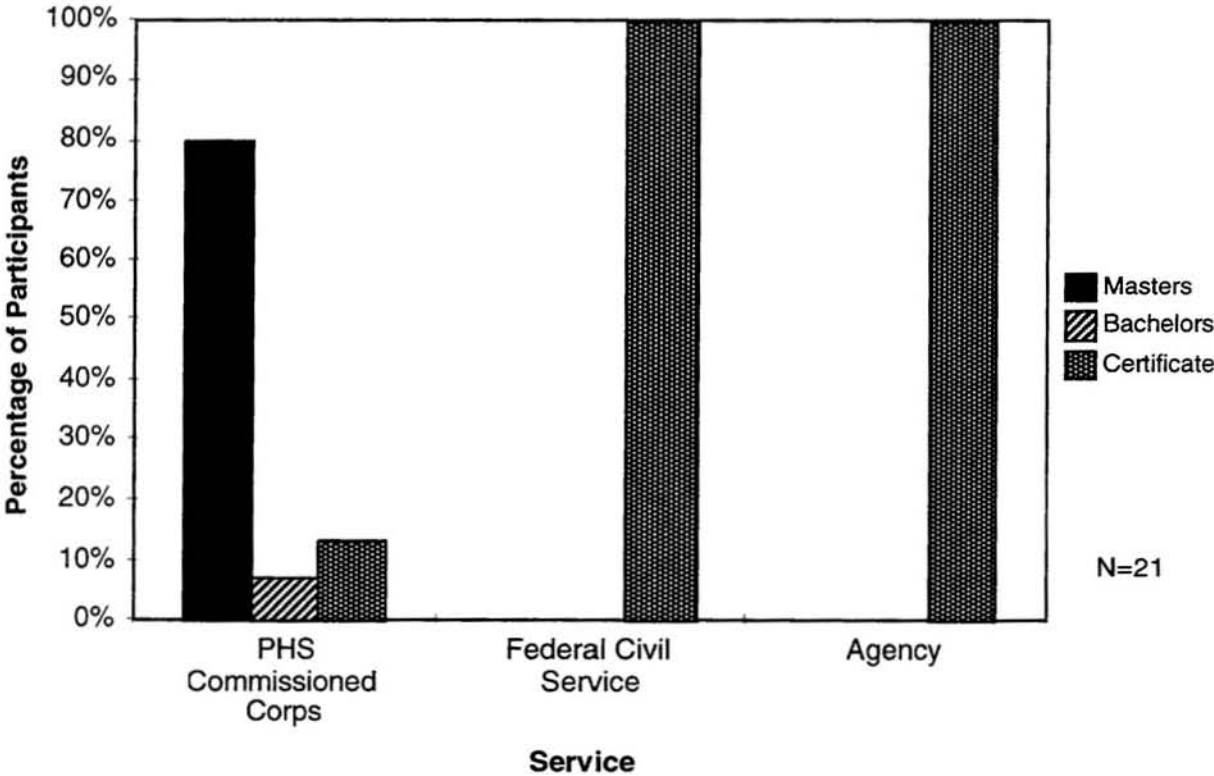


Figure 14.

degree and was pursuing a doctorate. The other two agency CRNAs (66.6 percent) had bachelors degrees as their highest degree. Figure 15 shows the highest degree held by participants grouped by service.

The next comparison was based on whether the respondent considered themselves to be a career IHS CRNA. It was interesting to note that 15 commissioned corps officers (95 percent) considered themselves career IHS CRNAs. Both civil service personnel (100 percent) also stated they were career IHS CRNAs. However, none of the tenen locum CRNAs considered themselves career IHS. (see figure 16)

The last comparison between service groups looked at their involvement in professional activities outside the OR. Commissioned corps officers were more likely to be involved in administrative and management duties; 50 percent were, compared to 30 percent for the other services combined. Also, it was noted that while corps officers were 80 percent involved in professional organizations 100 percent of the sample for the other services were members of such organizations. Both corps officers and the other two groups were similar in their involvement on committees and in staff education. Figure 17 reviews professional responsibilities grouped by employment service.

### Indian Health Service CRNA Survey Highest Degree Held by Participants Grouped by Service

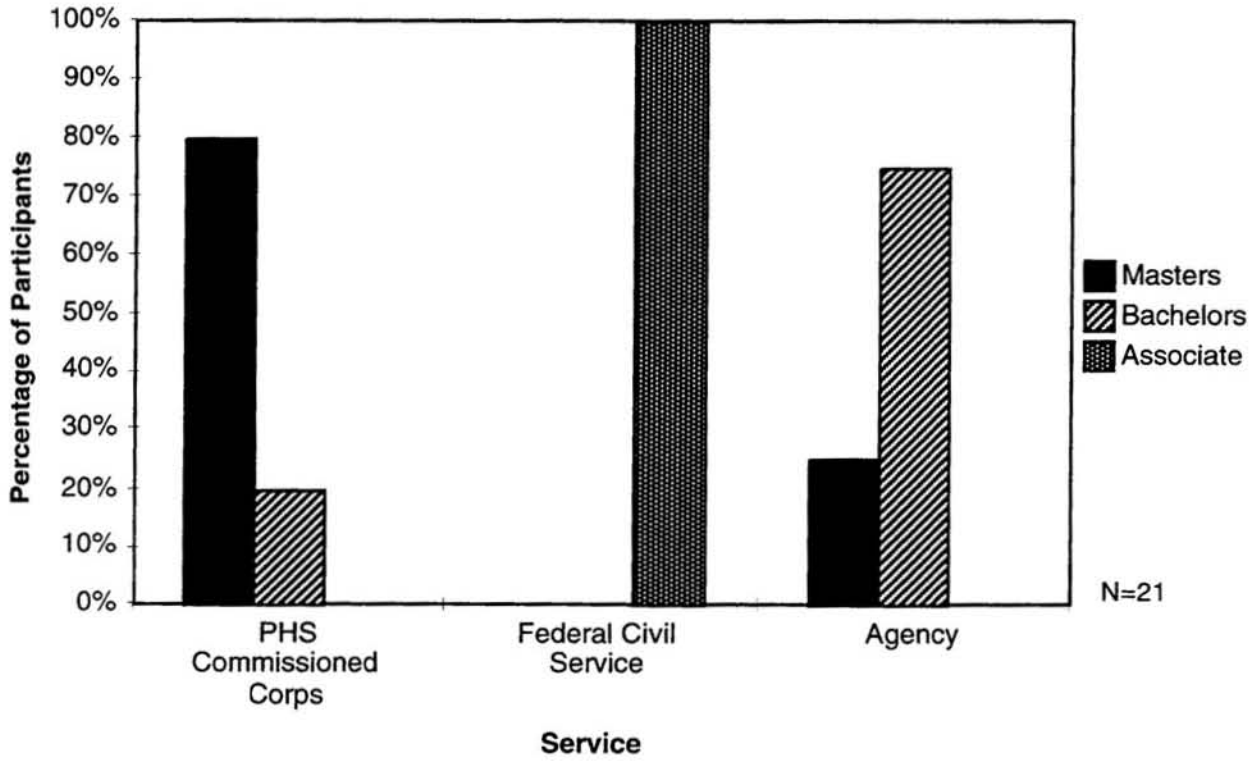


Figure 15.

### Indian Health Service CRNA Survey Participants Who Consider Themselves Career IHS

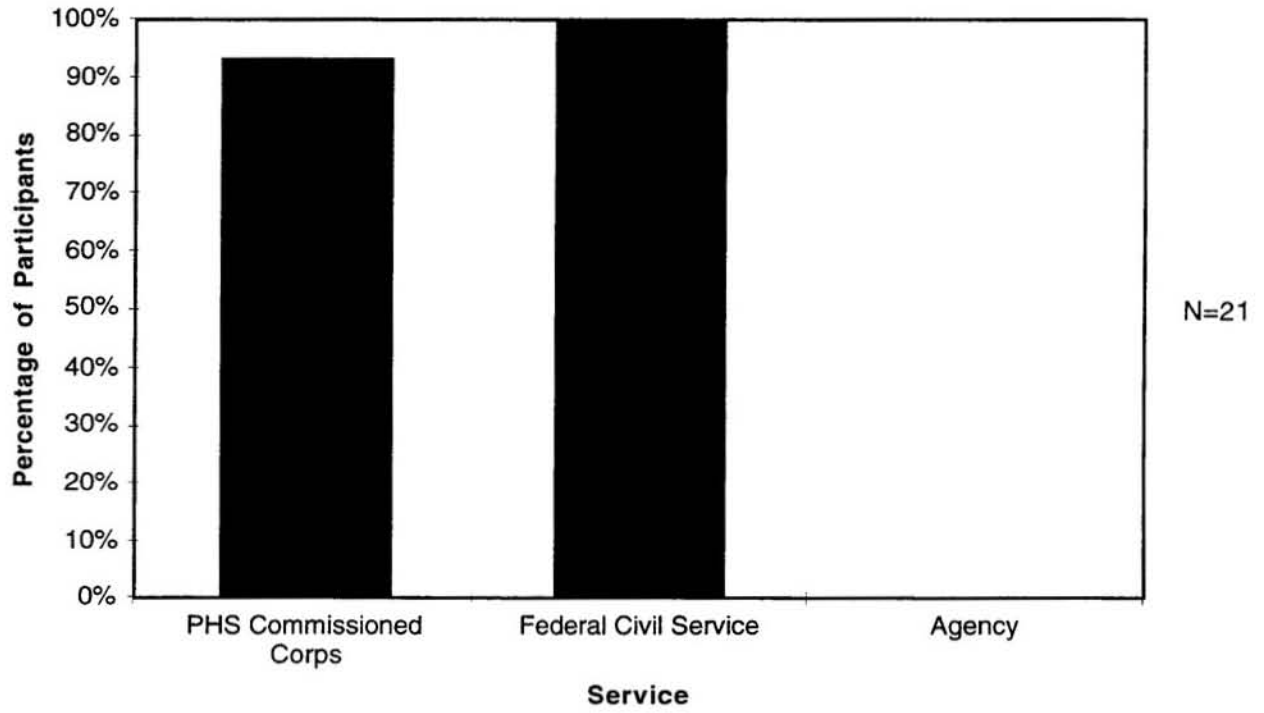
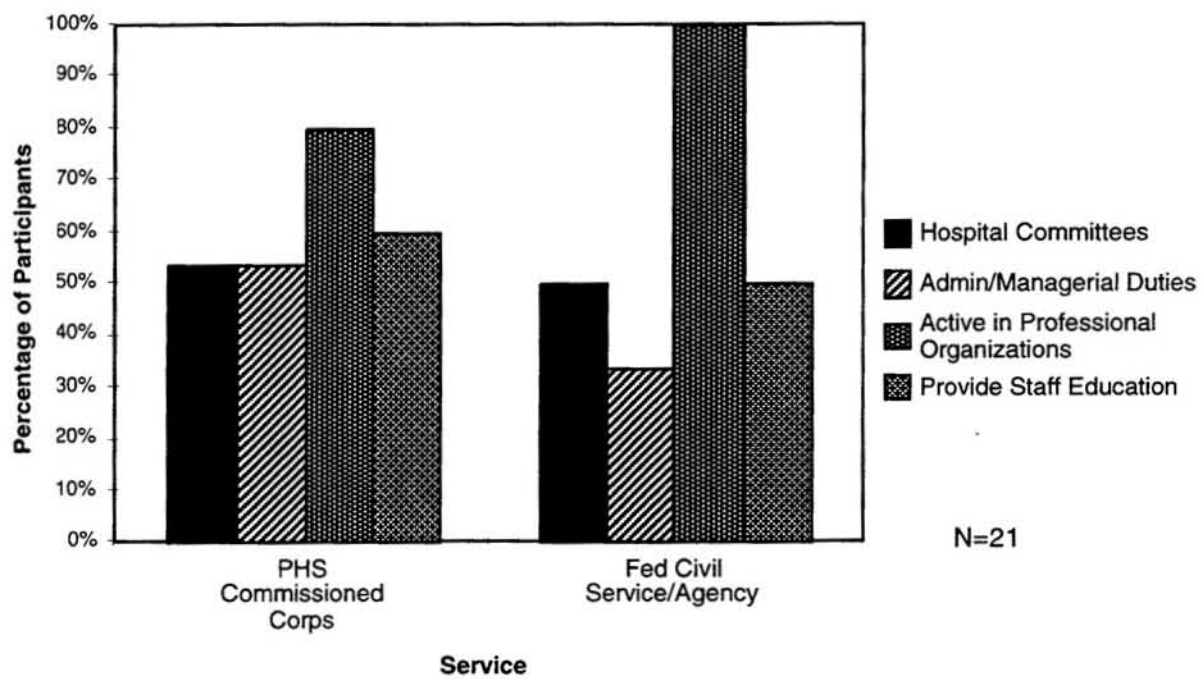


Figure 16.

**Indian Health Service CRNA Survey  
Professional Responsibilities Grouped by Service**



**Figure 17.**

### *Summary*

In summary, this survey provides a profile of nurse anesthetists in the IHS and generated data directed towards answering the four major research questions.

The sample population was found to be predominately (71 percent) PHS Commissioned Corps officers. Civil Service and locum tenens CRNAs were also represented. Sixty-six percent of the sample were male with a mean age of 44.29 years. Sixty-two percent received their anesthesia training in a masters framework and 67 percent held a masters as their highest degree attained. When asked the percentage of time an anesthesiologist was available over the previous year, only 46 percent of the sample claimed 100 percent staffing. Overall, the mean time that CRNAs shared sites with an anesthesiologist was 65.7 percent over the previous months. It was also noted that although anesthesiologists were apparently stationed at various sites, they were not always physically present when CRNAs practiced. Data addressing the third research question indicated the sample population universally practiced regional anesthesia. One-hundred percent of the sample performed epidural and IV regional anesthesia techniques. Ninety-five percent reported administering spinal anesthetics. And up to 85.7 percent of the sample reported doing peripheral nerve blocks of at least one type.

Data related to the last research question illustrated the sample group was involved in a wide range of professional activities beyond anesthesia care in the OR. Eighty-five percent of the sample claimed they were active in professional organizations. Forty-three percent said they had

administrative/managerial responsibilities. Fifty-two percent stated they were members on hospital committees. And, fifty-seven percent said they had provided staff education in the last year.

CHAPTER FIVE  
CONCLUSIONS AND RECOMMENDATIONS

*Overview of the Study*

The purpose of this study was to document the role and contributions CRNAs may provide to the IHS. This study further contributes to the literature regarding CRNA scope of practice and service.

Through contact with the IHS headquarters and directly to each potential CRNA site, a roster numbering 34 CRNAs was assembled. A questionnaire was mailed to the entire population with 21 CRNAs (61 percent) responding.

CRNAs in the sample were predominately members of the PHS commissioned corps. Most had a masters degree as their highest degree attained. A large majority viewed themselves as career IHS providers. It was interesting to note that nearly 100 percent of commissioned corps and civil service personnel planned on an IHS career. None of the agency anesthetists did. This may represent a distinction in basic orientation between these groups. Figure 18 provides an overview of data describing the sample.

Indian Health Service CRNAs showed a high degree of involvement with regional anesthesia. All reported practicing some form of regional anesthesia. Figure 19 lists the regional anesthesia techniques administered by the sample.

In regards to possible collaboration or supervision by an anesthesiologist, CRNAs were asked if an anesthesiologist was available at their site. It was calculated that the mean time an anesthesiologist was available at IHS sites for the sample population was 65.74 percent in the previous year. Therefore, for

Service	Sex		Average Age	Avg. Years as CRNA	Avg. Years in IHS	Career IHS	Highest Degree		
	Male	Female					Masters	Bachelors	Associate
PHS Commissioned Corps	11	5	41.5	6.3	9.1	14	12	3	0
Federal Civil Service	1	1	58.5	27.5	18.7	2	0	0	2
Agency	2	1	46.2	17.7	10	0	1	3	0
All Respondants	14	7	44.3	10.5	10.2	16	13	6	2

**Figure 18.**

<b>Type of Anesthesia</b>	<b>Number of Participants</b>
Ankle	8
Axillary Blocks	18
Caudel Blocks	11
Epidural	21
IV Regional	21
Spinal Anesthesia	20
Other Regional Blocks	17

**Figure 19.**

a significant share of the time no anesthesiologists were available at some sites. Although the absence of anesthesiologists from CRNA practice settings indicates CRNA autonomy, their presence does not necessarily indicate supervision. The survey did not seek information on how anesthesiologists and CRNAs interacted or provided coverage. However, several respondents noted that they worked shifts without an anesthesiologist in the hospital. For example, evening shifts and labor and delivery call were mentioned. Many IHS sites are small and may retain only one anesthesiologist and several CRNAs. Therefore it seems plausible that in order to provide coverage, CRNAs may work independently whether a physician anesthetist shares their site or not. One respondent noted that although an anesthesiologist was at her site, they were the sole anesthesia providers and only one of them worked at a time with the other being off.

The last area of data collection focused on CRNA involvement in professional activities outside the operating room area. The sample population displayed a diverse range of activities in this area. Activities ranged from providing hypnosis to research and working on hospital committees. In contrasting commissioned corps personnel with locum tenens a basic difference was seen. Commission corps were more likely to have administrative duties, 53.3% did, whereas only 25% percent of locum tenens had such responsibility. The IHS CRNA's as a whole had 52.4% involvement on hospital committees as compared to 33% cited earlier for the AANA membership survey in the 1975. This seems to fit with the fact that corps officers are also more likely to plan careers in the IHS. Figure 20 summarizes areas of professional activities.

<b>Professional Responsibilities</b>	<b>Service</b>		
	<b>PHS</b>	<b>Civil Service</b>	<b>Agency</b>
Hospital Committees	53.3%	0.0%	75.0%
Admin/Managerial Duties	53.3%	50.0%	25.0%
Active in Professional Organizations	80.0%	100.0%	100.0%
Provide Staff Education	60.0%	50.0%	50.0%

Figure 20.

### *Conclusions*

Based on the sample population, nurse anesthetists in the IHS appear to be committed to the Indian Health Service. Many contribute to staff education, hospital committees, and clinical support functions outside the OR. They also seem to have a high degree of satisfaction with their work based on the large percentage with career intentions.

Studies cited earlier have shown a correlation with work satisfaction and practice of clinical anesthesia. CRNAs in the Indian Health Service enjoy a degree of autonomy and scope of practice probably not available to all CRNAs. The CRNAs sampled displayed a broad scope of practice including regional anesthesia and independent practice. Such traits enable them to better serve their patients and meet the needs of the IHS.

It may be concluded that a broad interpretation of the CRNA role may best meet the needs of the nation. As health care costs soar and viable alternatives are sought, barriers to CRNA practice should be eliminated. The current crisis in health care cost creates a condition of necessity. Historically nurse anesthesia has flourished and proven itself under such conditions.

The interpretation and employment of the CRNA role is more difficult due to the overlapping functions they have with the anesthesiologist. Both professions will continue to exist. How the roles may change and interface with each other in the future remains to be seen.

Role theory provides insight into factors that may shape role development. Previously three processes that produce behaviors associated with a role were identified: education, socialization, and need.

Education is a key factor in role behaviors. It lays the ground work and directions one may pursue in their profession. Over the years nurse anesthetist training and education has evolved with the changes and advances in anesthesia care. As mentioned, a transition of all training programs to a masters framework will be complete by 1998. In the 1975 AANA survey previously cited, only seven out of 1286 respondents had a masters degree and none held doctorates. Now in comparison, out of only 21 respondents in the IHS, 14 held a masters degree and one was progressing toward a doctorate. The masters framework prepares for role behaviors not included in older training programs. Modern CRNAs are better prepared for broader professional roles. Politically they are more astute through activity in professional organizations. They are involved in scientific research and advancing to the doctorate level in education. They are prepared for behaviors consistent with a full independent clinical practice. In the highly technical and diverse role of nurse anesthesia, education is definitely key to influencing the range of behaviors that will be associated with the nurse anesthetist of the future.

Educational programs also play a key part in the socialization process that influences professional behaviors. Socialization goes beyond mere memorization of facts or integration of skills and knowledge. Socialization contributes to how a profession views itself. For example, program mentors and instructors may instill philosophical concepts. These concepts contribute to expectations and ideas about what the profession is and should accomplish. Such influences can contribute to personal expectations and level of actual performance. If the expectation of independent practice is instilled, individuals are likely to assume that goal and prepare for it. The power of socialization and

self concept obviously are strong factors in the roles people assume.

The idea of considering need as a process that contributes to role behaviors seems basic. Roles develop to meet need. The need for CRNA services has been chronicled from the advent of modern surgery. This is a process that perhaps more than ever calls for a broad CRNA role. It is a time of shortages and expanding cost in health care allocation for the entire population. In addition, special populations such as the underserved and military call for efficient and effective anesthesia practitioners. The concept of nursing and nurse anesthesia conjure images of role meeting need --- it has always been so.

In conclusion, nurse anesthetists in the IHS well represent modern nurse anesthesia. They are well educated providers, practicing a full range of anesthesia modalities. A percentage practice without direction or collaboration with an anesthesiologist. Their success as independent practitioners may be compared with the preponderance of CRNAs providing similar service in rural America. They are meeting the needs of their population. They do this not only through administration of anesthetics, but also involvement in other professional activities benefiting their organization and the population at large.

#### *Recommendations*

In view of the noteworthy contributions and apparent expertise of nurse anesthetists in the IHS, it makes sense that the organization continue to fully utilize them in the future. However, some CRNA positions in the IHS are being converted to physician anesthetists. This may be due to the current over supply of such practitioners as cited earlier. However, in the overall planning for anesthesia services, it should be remembered that nurse anesthesia services represent phenomenal savings with respect to the cost of training and

employing physicians. By creating new positions for physician providers, a less cost effective method of achieving anesthesia providers and services is perhaps supported.

Future studies should further evaluate the various relationships between nurse and physician anesthesiologists. Does collaboration or direction better describe the interaction between particular CRNAs and anesthesiologists? What is the nature of relationships between these anesthesia providers in the IHS? The results of such studies could help determine the best expression of the nurse/physician anesthesia care team. However, the anesthesia care team concept should not be accepted as the model for anesthesia delivery without question. Knowledge of the IHS and this study indicate that the care team concept does not exemplify CRNA practice in the IHS. It is difficult to direct another anesthesia provider when you are wholly involved in your own case or at home asleep. Perhaps in some situations a version of the anesthesia care team would be effective well in other cases more independent practitioners may be appropriate. Obviously we should not tolerate paying for two anesthesia providers when no prudent reason for doing so can be shown. Research focusing on patient outcomes in relation to anesthesia providers also seems indicated.

Future studies should continue to assess nurse anesthetists practice of regional anesthesia and leadership outside the perioperative area. Models for the most effective methods of preparation and training should be identified and advanced. CRNAs should be encouraged to seek administrative and clinical positions beyond the anesthesia department. CRNAs with the ability and preparation should assume positions such as directors of nursing, hospital CEO, and be on boards of managed care corporations. The unique clinical background and views of CRNAs could be assets in such positions.

Nurse Anesthetists represent a highly educated group who possess

diverse abilities. They must continue to get involved and serve as they are individually best suited. The profession must document and inform the public of their expertise and benefits to the health care system. They must continue to educate themselves to fully meet the anesthesia needs of their patients. They must do these things if the CRNA role is to play the part in future anesthesia delivery it has proven so capable of doing in the past.

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## APPENDIX A

## Introductory Letter

Dear Indian Health Service CRNA,

I am currently conducting research on CRNAs in the IHS and the range of services they provide. The information from this survey should assist in documenting the importance of the CRNA role and their value to the IHS. The questions are designed to gather basic demographic information, and survey responsibilities in clinical and non-clinical activities.

All information and responses provided will be held in strict confidentiality.

Please complete the survey and return in the self addressed and stamped envelope provided.

If you have any questions about this survey you may contact me at (301) 946-3514. Thank you for your kind assistance in this endeavor.

Sincerely,  
Mark J. Martineau, USPHS

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  
Survey

**INDIAN HEALTH SERVICE CRNA SURVEY**

Please check the following spaces as appropriate, or provide the information requested. Thank you.

*Demographics*

1. What is your age?\_\_\_\_\_
2. Male\_\_\_\_\_ Female\_\_\_\_\_
3. Ethnic origin? (optional) Caucasian\_\_\_\_\_ Native American/Eskimo\_\_\_\_\_ Black\_\_\_\_\_ Asian/South pacific\_\_\_\_\_ Hispanic\_\_\_\_\_
4. Do you claim Native American Status as defined in the IHS?\_\_\_\_\_
5. How long have you been a CRNA?\_\_\_\_\_
6. How long have you worked in the IHS?\_\_\_\_\_
7. Do you consider yourself a career IHS employee?\_\_\_\_\_
8. What type of CRNA program did you attend? Certificate\_\_\_\_\_ Bachelors\_\_\_\_\_ Masters\_\_\_\_\_
9. List any other degrees you hold \_\_\_\_\_

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10. Are you currently working towards an academic/professional degree?\_\_\_\_\_ If so, please state what degree?\_\_\_\_\_

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11. Are you federal civil service\_\_\_\_ PHS commissioned corps\_\_\_\_ agency\_\_\_\_\_

Autonomy and Regional Anesthesia

12. Is there currently an anesthesiologist at your site?\_\_\_\_\_
13. For the last 12 months, estimate the percentage time an anesthesiologist was available at your site?\_\_\_\_\_
14. Are you the sole anesthesia provider at your site?\_\_\_\_\_
15. Does a formal consulting or supervisory arrangement exist between CRNAs at your site and an anesthesiologist at another

site, please explain. \_\_\_\_\_

16. What regional blocks do you provide? Axillary \_\_\_\_\_  
 Ankle \_\_\_\_\_ Retro-Bulbar \_\_\_\_\_ IV Regional \_\_\_\_\_ caudal \_\_\_\_\_  
 Others \_\_\_\_\_

17. Do you provide spinal anesthesia? \_\_\_\_\_

18. Do you provide epidurals? \_\_\_\_\_

#### Other Professional Responsibilities

19. Do you provide clinical expertise in any other special area or service? \_\_\_\_\_

20. Do you respond to resuscitation codes? \_\_\_\_\_

21. Do you have special care unit support responsibilities? \_\_\_\_\_

22. Do you provide service to labor and delivery? \_\_\_\_\_

23. Are you a member of a national disaster response team? \_\_\_\_\_

24. Are you a member of any reserve component of the military? \_\_\_\_\_

25. Name any hospital committees you are a member of? \_\_\_\_\_

26. Name any administrative or managerial duties? \_\_\_\_\_

27. Name the three professional organizations you are most active in? \_\_\_\_\_

28. Have you served as an instructor in staff education in the last 12 months? Please list type of education provided? \_\_\_\_\_

---

29. Are you currently engaged in professional research ? \_\_\_\_\_

---

30. Have you published a professional paper or article in the last two years? \_\_\_\_\_

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31. List any professional presentations you gave in the last 12 months? \_\_\_\_\_

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