

2012

# Factors that Motivate Certified Registered Nurse Anesthetists to Practice Independently in the Appalachian Region

Michael Lee Frame Jr.  
mike.frame@camc.org

Follow this and additional works at: <http://mds.marshall.edu/etd>



Part of the [Anesthesiology Commons](#), and the [Nursing Commons](#)

---

## Recommended Citation

Frame, Michael Lee Jr., "Factors that Motivate Certified Registered Nurse Anesthetists to Practice Independently in the Appalachian Region" (2012). *Theses, Dissertations and Capstones*. 1054.  
<http://mds.marshall.edu/etd/1054>

This Research Paper is brought to you for free and open access by Marshall Digital Scholar. It has been accepted for inclusion in Theses, Dissertations and Capstones by an authorized administrator of Marshall Digital Scholar. For more information, please contact [zhangj@marshall.edu](mailto:zhangj@marshall.edu), [martj@marshall.edu](mailto:martj@marshall.edu).

FACTORS THAT MOTIVATE CERTIFIED REGISTERED NURSE ANESTHETISTS TO  
PRACTICE INDEPENDENTLY IN THE APPALACHIAN REGION

A Research Project submitted to  
the Graduate College of  
Marshall University

Final defense submitted  
in partial fulfillment of the requirements for the  
Doctorate of Management Practice in Nurse Anesthesia (DMPNA) degree  
conferred by Marshall University (MU) in partnership with the  
Charleston Area Medical Center (CAMC) based on a collaborative agreement between the  
MU Lewis College of Business and the CAMC School of Nurse Anesthesia

by

Michael Lee Frame, Jr., CRNA, MS

Approved by

Dennis Emmett, DBA, Committee Chairperson  
Cassandra Taylor, CRNA, DNP, DMP, CNE  
Craig O'Dell, CRNA, MS

Marshall University  
January 13, 2012

Approved by

\_\_\_\_\_  
Dennis Emmett, DBA  
*Committee Chair, Marshall University Lewis College of Business*

\_\_\_\_\_  
Date

\_\_\_\_\_  
Cassandra Taylor, CRNA, DNP, DMP, CNE  
*Charleston Area Medical Center School of Nurse Anesthesia*

\_\_\_\_\_  
Date

\_\_\_\_\_  
Craig O'Dell, CRNA, MS  
*Charleston Area Medical Center General Hospital  
and Thomas Memorial Hospital*

\_\_\_\_\_  
Date

## TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	iv
LIST OF TABLES AND FIGURES.....	v
<b>INTRODUCTION</b>	
• Background and Significance of the Problem.....	2
• Literature Review.....	2
• Statement of Problem and Research Purpose.....	7
<b>METHODOLOGY</b>	
• Research Hypothesis.....	7
• Research Design and Setting.....	8
• Sample Population with Description.....	8
• Procedure and Protocol.....	9
• Data Collection and Instruments.....	9
• Statistical Design and Analysis.....	10
• Ethical Considerations .....	11
<b>RESULTS</b>	
• Presentation, Analysis and Interpretation of the Data.....	11
<b>DISCUSSION</b>	
• Discussion of Study Results.....	14
• Study Limitations.....	18
CONCLUSIONS.....	18
IMPLICATIONS AND RECOMMENDATIONS.....	19
REFERENCES.....	21
<b>APPENDICES</b>	
• Appendix A: Counties In Appalachia .....	24
• Appendix B: Map of Appalachian Counties .....	27
• Appendix C: Informed Consent Letter .....	28
• Appendix D: Motivation Survey of Independently Practicing CRNAs In Appalachia.....	29
• Appendix E: IRB Approval Certificate .....	31

## EXECUTIVE SUMMARY

- **Introduction:** Independent Certified Registered Nurse Anesthetists (CRNAs) provide anesthesia services without the supervision or medical direction of anesthesiologists in healthcare facilities throughout the United States. The present literature is limited concerning the factors that motivate CRNAs to choose employment in rural independent practice.
- **Research Hypothesis:** In a sample of CRNAs who practice independently in one of the 13 states of the Appalachian region there will be no differences between the CRNAs from Appalachian and Non-Appalachian counties in their responses to the motivation factors of achievement, recognition, responsibility, advancement, work itself, salary, working conditions, company and administrative policies, supervision, and interpersonal relations, regardless of gender, marital status, highest degree earned, certification status, age, and years of CRNA experience.
- **Methodology:** The primary methodology for this prospective, quantitative research study was the utilization of a survey research design to collect data from CRNAs who practice independently in the Appalachian region. A total number of 460 CRNAs completed the survey, which resulted in a 9.5% response rate. After consideration of the inclusion criteria, 101 responding CRNAs were selected for the study ( $n = 101$ ). Descriptive statistics were used to describe the respondents.
- **Results:** Statistically significant findings were noted for the question concerning the *nature of the work itself* ( $p = .050$ ) and for the question concerning *no anesthesiologist supervision* ( $p = .030$ ). There were no significant differences between the independent CRNAs from Appalachian and Non-Appalachian counties based on gender, marital status, highest degree earned, certification status, age, and years of CRNA experience.
- **Discussion/Conclusions:** In this sample of CRNAs who practice independently in one of the 13 states of the Appalachian region it was shown that differences do exist between the CRNAs from Appalachian and Non-Appalachian counties in their responses to the motivation factors of the *nature of the work itself* and of *no anesthesiologist supervision*. These statistically significant differences show that the CRNAs in the Appalachian region are motivated more or less strongly to practice independently, at least for these two factors, depending on whether they practice in Appalachian or Non-Appalachian counties.
- **Implications/Recommendations:** The results from this study should provide valuable insight concerning the most significant factors motivating CRNAs to practice independently in the Appalachian region. The survey instrument could be adapted to not only survey the motivation of independently practicing CRNAs, but also the motivation of all CRNAs in the target group.
- **Keywords:** Independent CRNAs, Appalachian Region, Motivation

## LIST OF TABLES

TABLE 1. Demographic and Anesthesia Practice Information.....	11
TABLE 2. T-Test for Age and Years of CRNA Experience.....	12
TABLE 3. T-Test for Ten Motivation Factors.....	13
TABLE 4. Open-Ended Question Comments.....	13

## INTRODUCTION

### *Background and Significance of the Problem*

Independent Certified Registered Nurse Anesthetists (CRNAs) provide anesthesia services without the supervision or medical direction of anesthesiologists in healthcare facilities throughout the United States. Approximately 27% of CRNAs working nationwide are practicing without anesthesiologists (Alves, 2005). This particular type of CRNA practice is more prevalent in America's rural areas (American Association of Nurse Anesthetists, 2010). Approximately 42% of the population in America's Appalachian region is considered rural as compared with 20% of the population nationwide (Appalachian Regional Commission, 2011). According to the Appalachian Regional Commission (ARC), the Appalachian region is a 205,000-square-mile area encompassing all of West Virginia and parts of 12 other states including Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia (Appalachian Regional Commission, 2011). A comprehensive list of all of the counties in the Appalachian region as well as a map of Appalachian counties can be found in Appendices A and B. CRNAs are qualified through their education, licensure, and certification to provide comprehensive anesthesia care in all 50 states and to U.S. military personnel worldwide (American Association of Nurse Anesthetists, 2010).

The present literature is limited concerning the factors that motivate CRNAs to choose employment in rural independent practice. In this study, CRNAs practicing without the supervision or medical direction of anesthesiologists will be referred to as independent CRNAs.

### *Literature Review*

According to the American Association of Nurse Anesthetists (AANA), CRNAs provide 32 million anesthetics to patients annually in the U.S. CRNAs are the primary anesthesia

providers in the rural U.S. In some states CRNAs are the sole anesthesia providers in almost 100% of their rural facilities (American Association of Nurse Anesthetists, 2010).

The U.S. is expected to experience an expanding nursing shortage as baby boomers grow older and healthcare demand increases (American Association of Colleges of Nursing, 2011). The nursing shortage ultimately induces a shortage of CRNAs to provide anesthesia services in rural areas (Szigeti, Largen, & Eberhardt, 1990). The current shortage of nurse anesthetists practicing rurally in the U.S. will continue to worsen over time (Coleman, 2008).

Independent practice of CRNAs is especially important in rural areas where anesthesiologists are less likely to work. Therefore, CRNAs who are willing to work independently become increasingly more important in these rural locations (Dulisse & Cromwell, 2010). Furthermore, in rural areas where lower demand for surgery is more likely, clinical facilities have the greatest opportunity for positive net revenue when CRNAs practice independently (Hogan, Seifert, Moore, & Simonson, 2010). An analysis of claims data suggested that private payers benefited from a lower cost when their care was provided by independently practicing CRNAs (Hogan et al., 2010). As of 2001, the Centers for Medicare and Medicaid Services (CMS) have allowed individual states to opt out of the requirement that, for reimbursement purposes, surgeons or anesthesiologists must supervise CRNAs. From 1999 to 2005, the proportion of surgeries where CRNAs provided anesthesia care independently increased by approximately five percent in both the states that opted-out and those that did not (Dulisse & Cromwell, 2010). Additionally, it was found that this increase in CRNAs practicing independently resulted in no increase in adverse outcomes in either the states that opted-out or those that did not (Dulisse & Cromwell, 2010).

In order to consider motivation as it relates to the advanced practice registered nurse, it is important to have an understanding of the term advanced practice nursing. Advanced practice registered nurses are capable of performing nursing interventions that influence patient outcomes, including direct patient care and various avenues of management and administration (O'Grady, 2008). The certified nurse-midwife (CNM), CRNA, clinical nurse specialist (CNS), and the nurse practitioner (NP) can each be described using the term advanced practice registered nurse (O'Grady, 2008). As for the understanding of motivation, to be motivated means that a person has been moved toward doing something (Ryan & Deci, 2000). Similarly, motivation can be defined as the set of forces that influence the actions of a person (Amundsen & Corey, 2000). Advanced practice registered nurses must have a clear understanding of their individual needs of motivation in order to be positioned successfully within their career (Amundsen & Corey, 2000). After successful career placement, advanced practice nurses can practice in a setting that complements their specific skill sets and allows them to maximize their individual contributions (Amundsen & Corey, 2000).

Motivation can be divided into either intrinsic motivation, meaning doing something for an inherent satisfaction, or extrinsic motivation, when something is done in an attempt to gain some separable outcome (Ryan & Deci, 2000). However, intrinsic and extrinsic motivations must be taken into consideration together (Vasu, Stewart, & Garson, 1998). Herzberg's theory of motivation will be utilized as the theoretical framework for this study. This two-factor theory is based upon the idea that motivation can be divided into two parts: motivation factors and hygiene factors (Ball, 2003). The motivation factors, or *intrinsic factors*, are directly related to the satisfaction gained from a job. The hygiene factors, or *extrinsic factors*, are concerned with the job itself, but are not directly a part of it (Ball, 2003).

These researchers have concluded that five motivation factors, or the intrinsic factors, lead to job satisfaction. Intrinsic factors that promote job satisfaction include achievement, recognition, responsibility, advancement, and the work itself (Ball, 2003).

#### *Intrinsic Factor Explanations*

- *Achievement.* Herzberg theorized that most individuals desire to do well at their jobs (Syptak, Marsland, & Ulmer, 1999). Employers should clearly define the goals and standards for each position, as well as, offering their employees regular feedback on their job performance (Syptak, Marsland, & Ulmer, 1999).
- *Recognition.* Employee achievements should be formally recognized by an employer through a formal recognition program (Syptak, Marsland, & Ulmer, 1999).
- *Responsibility.* Allowing employees greater autonomy in their jobs motivates them to do well by establishing a sense of job ownership (Syptak, Marsland, & Ulmer, 1999).
- *Advancement.* Company loyalty and high job performance can be rewarded through advancement within an employee's current position, but may also include allowing him or her the opportunity to pursue further education and advanced degrees (Syptak, Marsland, & Ulmer, 1999).
- *Work itself.* Performing work that is important and meaningful can serve as one of the most important factors in employee motivation; therefore, employers should emphasize this through sharing positive outcome data and patient comments (Syptak, Marsland, & Ulmer, 1999).

The researchers also concluded that five hygiene factors, or the extrinsic factors, are necessary in order to prevent job dissatisfaction. Extrinsic factors that prevent job dissatisfaction

include salary, working conditions, company and administrative policies, supervision, and interpersonal relations (Ball, 2003).

#### *Extrinsic Factor Explanations*

- *Salary.* Salary does not directly motivate employees; however, poor compensation can result in job dissatisfaction. (Syptak, Marsland, & Ulmer, 1999). Employers should develop clear policies concerning salaries, raises, and bonuses (Syptak, Marsland, & Ulmer, 1999).
- *Working conditions.* The working conditions that exist within a facility and its surroundings can foster a sense of pride among employees and the services they provide (Syptak, Marsland, & Ulmer, 1999).
- *Company and administrative policies.* Company and administrative policies do not motivate employees; however, dissatisfaction can develop among employees when these policies are unclear, unfair, or even unnecessary entirely (Syptak, Marsland, & Ulmer, 1999).
- *Supervision.* Employers can attempt to reduce the risk for employee dissatisfaction with leadership by making wise decisions when appointing a new supervisor or manager (Syptak, Marsland, & Ulmer, 1999).
- *Interpersonal relations.* Positive interpersonal relationships among employees in the workplace can promote a greater sense of teamwork that can result in a higher degree of job satisfaction (Syptak, Marsland, & Ulmer, 1999).

A nationwide study of CRNAs attempted to examine job satisfaction as it relates to turnover (Loeffler, 1993). The literature review done for this study revealed that most managers agree that job satisfaction is critical in the workplace; however, they understand that only part of

the factors contributing to this satisfaction are within their control (Loeffler, 1993). It was also concluded that placing more attention on intrinsic factors might reduce turnover in anesthesia departments (Loeffler, 1993). The researcher recommended that further research should be done to determine if any trends exist in CRNA job satisfaction among different regions or groups within the CRNA population including those practicing independently (Loeffler, 1993).

### *Statement of the Problem and Research Purpose*

Currently, little is known about the factors that motivate these CRNAs to choose employment in rural independent practice.

The purpose of this prospective, quantitative survey was to identify and describe the factors that motivate CRNAs to practice independently in one of the 13 states of the Appalachian region. The objectives for this study were:

- 1) to describe the respondents,
- 2) to determine if there are any significant differences between the independent CRNAs from Appalachian and Non-Appalachian counties based on the factors of gender, marital status, highest degree earned, certification status, age, years of CRNA experience, and the ten motivation factors.

## METHODOLOGY

### *Research Hypothesis*

In a sample of CRNAs who practice independently in one of the 13 states of the Appalachian region there will be no differences between the CRNAs from Appalachian and Non-Appalachian counties in their responses to the motivation factors of achievement, recognition, responsibility, advancement, work itself, salary, working conditions, company and administrative policies, supervision, and interpersonal relations, regardless of gender, marital status, highest degree earned, certification status, age, and years of CRNA experience.

### *Research Design and Setting*

The primary methodology for this prospective, quantitative research study was the utilization of a survey research design to collect data from CRNAs who practice independently in the Appalachian region. An email survey was used to reach the large number of independent CRNAs practicing in this vast geographic area.

### *Sample Population with Description*

The sample size was calculated utilizing the software available on the internet homepage of Daniel Soper (Soper, 2011). An *a priori* power analysis was conducted using an alpha level of 0.05, an anticipated effect size of 0.8, and a desired statistical power level of 0.9. This *a priori* power analysis resulted in a minimum total required sample size of 56 for a one-tailed hypothesis and 68 for a two-tailed hypothesis. According to the AANA, the average response rate for research done using an email survey is 10% to 12% (American Association of Nurse Anesthetists, 2011). In addition, approximately 27% of CRNAs working nationwide are practicing without anesthesiologists (Alves, 2005). Therefore, it was determined that the email survey should be distributed to approximately 5,000 CRNAs.

A sample of 5,000 CRNAs from the 13 states of the Appalachian region of the United States received an email survey distributed by the AANA. The email survey was launched on October 19, 2011 and closed on November 17, 2011. The AANA reported that 155 recipients chose to opt-out of the survey. This resulted in 4,845 CRNAs that chose to accept the email invitation to participate in the survey. A total number of 460 CRNAs actually completed the survey, which resulted in a 9.5% response rate. Responses were tabulated from those CRNAs who meet the following inclusion criteria: 1) registered nurse anesthetists who are certified or recertified as nurse anesthetists by the National Board on Certification and Recertification of

Nurse Anesthetists, 2) actively engaged in anesthesia practice, 3) providing anesthesia in one of the 13 states of the Appalachian region, and 4) practicing without the supervision or medical direction of anesthesiologists. After consideration of the inclusion criteria, 101 responding CRNAs were selected for the study (n = 101).

### *Procedure and Protocol*

The AANA provides a service to members and non-members of the AANA to deliver and manage email surveys of all or part of the AANA membership. This survey was submitted to the AANA. Upon successful fulfillment of the AANA's requirements, the survey was distributed to a sample of 4,845 from the 13 states of the Appalachian region of the United States. Each CRNA received an email inviting the recipient to participate in the study. A second email was sent to the same 4,845 CRNAs, again asking them to participate in the study. Each of these two emails contained a clickable link to the survey for this study. An informed consent letter for this study had to be reviewed by each CRNA prior to beginning the survey (Appendix C). By completing the survey, the CRNA acknowledged that he or she read the letter and consented to participate in this research. All email addresses and any other identifying information was only known to members of the AANA Research Department. The results of the survey were kept completely confidential on a password-protected computer.

### *Data Collection and Instruments*

In addition to delivering and managing the survey, the AANA provided the results of the survey in an Excel file for statistical analysis. The survey consisted of three sections: (a) demographic information including gender, age, marital status, and highest degree earned; (b) current anesthesia practice information including certification status, years of CRNA experience, and the zip-code of the CRNAs primary workplace; (c) motivation factor statements. The survey

utilized a Likert scale (1-4) to measure the degree of importance that the surveyed CRNAs placed on each motivation factor statement. Each item was rated from 1 (Strongly Agree) to 4 (Strongly Disagree), (Appendix D).

### *Statistical Design and Analysis*

The purpose of this prospective, quantitative survey was to identify and describe factors that motivate CRNAs to practice independently in one of the 13 states of the Appalachian region. The independent variables were the six demographic and anesthesia practice variables: gender, marital status, highest degree earned, certification status, age, and years of CRNA experience. The dependent variables were the ten motivation factors: achievement, recognition, responsibility, advancement, work itself, salary, working conditions, company and administrative policies, supervision, and interpersonal relations. Descriptive statistics were used to describe the respondents. Cross tabulation was utilized to examine the relationship between the CRNAs from Appalachian and Non-Appalachian counties in relation to the demographic variables of gender, marital status, highest degree earned, and certification status. An independent samples t-test was conducted to examine whether there was a significant difference between the CRNAs from Appalachian and Non-Appalachian counties in relation to their age and years of CRNA experience. Additionally, an independent samples t-test was conducted to determine whether there was a significant difference between the CRNAs from Appalachian and Non-Appalachian counties and each of the ten motivation factors. The Statistical Package for the Social Sciences (SPSS) Version 19 was used to analyze the statistical data found in the Excel file provided by the AANA after completion of the survey (SPSS IBM Company, 2010). The accepted level of statistical significance for this study was  $p < .05$ .

### *Ethical Considerations*

This study was approved by CAMC and West Virginia University/Charleston Division Institutional Review Board on September 7, 2011 (Appendix E).

## RESULTS

### *Presentation, Analysis and Interpretation of the Data*

The survey was distributed to a sample of 4,845 CRNAs. A total number of 460 CRNAs from this sample completed the survey resulting in a response rate of 9.5%. After consideration of the inclusion criteria, 101 responding CRNAs were selected for the study (n = 101). More specifically, two groups are represented in this sample of CRNAs (n = 101), the Appalachian respondents (n = 36) and the Non-Appalachian respondents (n = 65). Demographic and anesthesia practice information for the Appalachian and Non-Appalachian respondents is found in Table 1. No significant differences were demonstrated between the two groups of CRNAs based on gender, marital status, highest degree earned, or certification status.

<b>Table 1: Demographic and Anesthesia Practice Information</b>				
<b>Survey Question (n = 101)</b>		<b>Appalachian Frequency (n = 36)</b>	<b>Non-Appalachian Frequency (n = 65)</b>	<b>Significance</b>
<b>Gender</b>	Male	21(58%)	34 (52%)	.560
	Female	15 (42%)	31 (48%)	
<b>Marital Status</b>	Single	4 (11%)	11(17%)	.431
	Married	32 (89%)	54 (83%)	
<b>Highest Degree Earned</b>	Bachelor's	16 (44%)	17 (26%)	.061
	Master's or Doctorate	20 (56%)	48 (74%)	
<b>Certification Status</b>	Certified	18 (50%)	37 (57%)	.503
	Recertified	18 (50%)	28(43%)	

The accepted level of statistical significance for this study was  $p < .05$ .

An independent samples t-test was conducted to examine whether there was a significant difference between the CRNAs from Appalachian and Non-Appalachian counties in relation to their age and years of CRNA experience. No significant differences were demonstrated between

the two groups of CRNAs based on age or years of CRNA experience. These results can be found in Table 2.

<b>Table 2: T-Test for Age and Years of CRNA Experience</b>			
<b>Survey Question (n = 101)</b>	<b>Appalachian Mean (n = 36)</b>	<b>Non-Appalachian Mean (n = 65)</b>	<b>Significance</b>
<b>Years of Age</b>	52.33	50.75	.469
<b>Years of CRNA Experience</b>	22.17	20.57	.502
The accepted level of statistical significance for this study was $p < .05$ .			

Each CRNA was asked to measure the degree of importance that they place on each motivation factor statement using a Likert scale (1-4) with 1 indicating strongly agree and 4 indicating strongly disagree. After calculating the means for each item, an independent samples t-test was conducted to compare these means. The results of this analysis are found in Table 3. Statistically significant findings were noted for the question concerning the *nature of the work itself* ( $p = .050$ ) and for the question concerning *no anesthesiologist supervision* ( $p = .030$ ). The question about the *nature of the work itself* resulted in a mean Likert score of 1.69 for the Appalachian group and 1.33 for the Non-Appalachian group. Therefore, the Non-Appalachian group more strongly agreed that the *nature of the work itself* motivates them to practice independently. As for the question concerning *no anesthesiologist supervision*, the mean Likert score for the Appalachian group was 2.08 and 1.61 for the Non-Appalachian group. As a result, the Non-Appalachian group more strongly agreed that *no anesthesiologist supervision* motivates them to practice independently.

<b>Table 3: T-Test for Ten Motivation Factors</b>			
<b>Motivation Survey (n = 101)</b>	<b>Appalachian Mean Likert Score (n = 36)</b>	<b>Non-Appalachian Mean Likert Score (n = 65)</b>	<b>Significance</b>
The opportunity for <i>achievement</i> motivates me to practice independently.	1.78	1.55	.231
The opportunity for <i>recognition</i> motivates me to practice independently.	2.25	2.16	.094
The level of <i>responsibility</i> motivates me to practice independently.	1.75	1.52	.234
The opportunity for <i>advancement</i> motivates me to practice independently.	2.36	2.28	.080
The nature of the <i>work itself</i> motivates me to practice independently.	1.69	1.33	.050
The <i>salary</i> motivates me to practice independently.	2.08	1.94	.466
The <i>working conditions</i> motivate me to practice independently.	1.81	1.48	.072
<i>Company/administrative policies</i> motivate me to practice independently.	2.31	2.17	.539
No anesthesiologist <i>supervision</i> motivates me to practice independently.	2.08	1.61	.030
<i>Interpersonal relations</i> motivate me to practice independently.	1.94	1.75	.325
The accepted level of statistical significance for this study was $p < .05$ .			

The survey respondents were also asked if they had any further thoughts or ideas concerning what motivates CRNAs to practice independently. This one open-ended question resulted in a variety of comments from both the Appalachian and Non-Appalachian respondents. A summary of these comments can be found in Table 4.

<b>Table 4: Open-Ended Question Comments – What motivates CRNAs to practice independently?</b>	
<b>Appalachian Respondents</b>	<b>Non-Appalachian Respondents</b>
Better income More salary More respect Location Availability of jobs Greater autonomy/responsibility Personal in nature	Desire to utilize training/education Confidence in abilities/skills Challenges of independent practice Greater autonomy Control over scheduling Satisfaction of independent decision making Reward of successful anesthetic

## DISCUSSION

### *Discussion of Study Results*

Rural healthcare leaders must begin to recognize the vital importance of CRNAs in their anesthesia workforce planning (Seibert, Alexander, & Lupien, 2004). As the demand for healthcare services increases, it becomes more important to produce a larger CRNA workforce and to allow them to practice in models that can both contain costs and maintain quality care (Hogan et al., 2010). However, there is a current shortage of nurse anesthetists practicing rurally in the U.S. and this shortage will continue to worsen over time (Coleman, 2008). Therefore, in order to maintain a balance between supply and demand, rural healthcare leaders must have a greater understanding of the obvious and not-so-obvious factors that influence CRNAs to choose an independent anesthesia practice.

The purpose of this prospective, quantitative survey was to identify and describe the factors that motivate CRNAs to practice independently in one of the 13 states of the Appalachian region. There were two objectives defined specifically for this study. The respondents were described (Objective 1) according to their demographic and anesthesia practice information, as well as, by their age and years of CRNA experience. The two groups were similar to each other concerning these variables. There were no significant differences between the independent CRNAs from Appalachian and Non-Appalachian counties based on gender, marital status, highest degree earned, certification status, age, and years of CRNA experience (Objective 2). As for the ten motivation factors (Objective 2), statistically significant findings were noted for the question relating to the *nature of the work itself* ( $p = .050$ ) and for the question concerning *no anesthesiologist supervision* ( $p = .030$ ).

As for the statistically significant findings, the Non-Appalachian group more strongly agreed that the *nature of the work itself* motivates them to practice independently. Alternatively, it can be stated that the Appalachian group agreed that they are less motivated by the *nature of work itself* to practice independently than is the Non-Appalachian group. Additionally, statistically significant findings were found after the analysis of the question concerning *no anesthesiologist supervision*. The Non-Appalachian group more strongly agrees that *no anesthesiologist supervision* motivates them to practice independently. Interestingly, it would appear that the Appalachian respondents are less concerned with no anesthesiologist supervision than the Non-Appalachian group.

In addition to the differences between these two groups, several similarities did emerge between them as well. They were of similar in age, 52.33 for the Appalachian group and 50.75 for the Non-Appalachian group, as well as similar in years of experience, 22.17 for the Appalachian group and 20.57 for the Non-Appalachian group. As a result, these two groups can be compared with less concern on whether or not age and years of experience can bias the CRNAs' opinion on what motivates them. For example, a newly graduated CRNA may desire more autonomy in their role as a CRNA, but may not feel ready for that responsibility yet in their early career. The two groups were also similar in their responses to the questions concerning achievement, recognition, responsibility, advancement, salary, working conditions, company/administrative policies, and interpersonal relations. A significant difference existed between the two groups concerning no anesthesiologist supervision. Therefore, it may then be reasonable to assume that a difference should have also existed between the two groups concerning the level of responsibility. Specifically, the Non-Appalachian group more strongly agrees that no anesthesiologist supervision motivates them to practice independently, so it could

also be said that these CRNAs are motivated by a greater level of responsibility since they desire less supervision. However, this assumption was not confirmed with this study.

The survey used in this study containing primarily quantitative questions; however, the survey respondents were also asked if they had any further thoughts or ideas concerning what motivates CRNAs to practice independently. This one open-ended question resulted in a variety of comments from both the Appalachian and Non-Appalachian respondents.

In addition to a number of comments concerning 'better income' and 'more salary', the Appalachian respondents also identified 'more respect' from their facility physicians as a source of motivation to practice independently. Many of the Appalachian respondents shared that 'location' and the "availability of jobs" motivated them to choose independent practice. Several Appalachian respondents commented that a greater level of autonomy and responsibility have contributed to their desire to work independently. Lastly, a number of the commenting Appalachian respondents expressed that their motivation to practice independently is 'personal' in nature. One Appalachian respondent explained that 'you really feel like you're doing something for the good of the people' and many expressed that they are 'providing a need' to their communities. An additional respondent shared that 'my community knows I am here and are comforted when they see me come in the door. That is quite a reward in and of itself'.

The Non-Appalachian respondents shared a variety of comments concerning independent practice including a desire to 'do the work that CRNAs are trained and educated to do'. The Non-Appalachian respondents agreed that CRNAs who choose independent practice must 'be confident' in their ability to provide anesthesia and in the management of 'stressful situations independently'. Many of the Non-Appalachian respondents shared that they 'love the challenge of using all their knowledge and skill sets' to provide anesthesia in independent practice. Several

respondents from the Non-Appalachian group believe that autonomy and ‘control over schedule’ motivate them to choose independent practice. One respondent expressed that they are motivated by the “satisfaction of independent decision making and the reward of an ensuing successful anesthetic”.

Each group, Appalachian and Non-Appalachian, had similar thoughts and ideas concerning what motivates CRNAs to practice independently. However, there were several notable differences in their thinking about independent practice. First, the Appalachian group seems to focus a portion of their motivation on the personal side independent practice. It seems that the Appalachian CRNAs are motivated by how others view their worth and contribution to their particular facility. The Non-Appalachian group did not allude to this same thought process in their comments, but it is reasonable to believe that they do share the same motivations. However, it could be theorized that the Appalachian CRNAs practice in more remote areas and among smaller communities where a sense of closeness and family are commonplace. This could lend itself to a more personal atmosphere where which these CRNAs practice. Lastly, the Non-Appalachian group included multiple comments centered on the idea of control. While both groups shared that autonomy motivates them, it appears that more control and the ability to practice to their fullest capability is more important to the Non-Appalachian CRNAs. It may be possible that many of these CRNAs have experience in larger institutions where they experience less control over their workday and a greater degree of supervision. Then, for the Non-Appalachian CRNAs, the motivation may be to seek independent practice where there is less control over details of the workday and during the care of a patient. Additional research is needed to further explore and test the explanations that have been theorized during the discussion of this open-ended question.

### *Study Limitations*

A significant limitation of this study was the unknown reliability and validity of the survey instrument. The decision to launch the survey without a pilot test may have decreased the validity that the respondents would understand the true meaning of each question as it was intended. The size of the Appalachian group (n = 36) and the Non-Appalachian group (n = 65) were less than 68, which could have contributed to a type II error. As a result, differences could have existed between the two groups that were not detected due to small sample size and inadequate power. In addition, this survey required CRNAs to choose their highest degree earned. The available choices for this question included a Bachelor's, Master's, or Doctorate degree. Unfortunately, this question failed to consider those CRNAs that are currently practicing with a diploma or certificate. In addition, this study focused on CRNAs practicing independently in the 13 states of the Appalachian region. Therefore, the results of this study are specific to independent CRNAs practicing in this particular region. As a result, these findings cannot be generalized to all independent CRNAs or to other regions. Lastly, the survey instrument was designed to survey the motivation of independently practicing CRNAs and not to all CRNA practice types.

### CONCLUSIONS

Independent Certified Registered Nurse Anesthetists (CRNAs) provide anesthesia services without the supervision or medical direction of anesthesiologists in healthcare facilities throughout the United States. The present literature is limited concerning the factors that motivate CRNAs to choose employment in rural independent practice.

The purpose of this prospective, quantitative survey was to identify and describe the factors that motivate CRNAs to practice independently in one of the 13 states of the Appalachian

region. The primary methodology for this prospective, quantitative research study was the utilization of a survey research design to collect data from CRNAs who practice independently in the Appalachian region. An email survey was used to reach the large number of independent CRNAs practicing in this vast geographic area. The survey was distributed to a sample of 4,845 CRNAs. A total number of 460 CRNAs from this sample completed the survey resulting in a response rate of 9.5%. After consideration of the inclusion criteria, 101 responding CRNAs were selected for the study (n = 101).

In this sample of CRNAs who practice independently in one of the 13 states of the Appalachian region it was shown that differences do exist between the CRNAs from Appalachian and Non-Appalachian counties in their responses to the motivation factors of the *nature of the work itself* and of *no anesthesiologist supervision*. These statistically significant differences show that the CRNAs in the Appalachian region are motivated more or less strongly to practice independently, at least for these two factors, depending on whether they practice in Appalachian or Non-Appalachian counties. Specifically, the Non-Appalachian group more strongly agreed that the *nature of the work itself* motivates them to practice independently. In addition, it would appear that the Appalachian respondents are less concerned with no anesthesiologist supervision than the Non-Appalachian group.

#### IMPLICATIONS AND RECOMMENDATIONS

Prior to this study, little was known about the factors that motivate CRNAs to choose employment in rural independent practice. Healthcare leaders in the 13 states of the Appalachian region can utilize the knowledge gained from this study to gain a better understanding of the factors that motivate CRNAs in their region to practice independently. Specifically, the results from this study have demonstrated that CRNAs in the Non-Appalachian group are motivated to

practice independently by the *nature of the work itself* and of *no anesthesiologist supervision*.

Non-Appalachian healthcare leaders should be able to utilize this knowledge to begin strategically planning for future anesthesia needs in their facilities.

However, no significant findings were found in relation to the motivation of CRNAs in the Appalachian group. Therefore, healthcare leaders in the Appalachian region cannot utilize this knowledge with similar confidence since no significant findings were found among the CRNAs in this group. It is possible that this email survey failed to capture what motivates CRNAs in the Appalachian group to practice independently. Future research should be conducted to further investigate the motivation of Appalachian CRNAs perhaps with the use of a qualitative based study.

The findings of this research will be presented to CRNAs and other healthcare leaders through presentations at professional conferences, publication in professional journals, and as a poster presentation.

This study could be improved by selecting a specific AANA region to use as the target group or to conduct a nationwide survey. In addition, the survey instrument could be adapted to not only survey the motivation of independently practicing CRNAs, but also the motivation of all CRNAs in the target group. These improvements may allow for additional practice comparisons.

## REFERENCES

- Alves, S. (2005). A Study of Occupational Stress, Scope of Practice, and Collaboration in Nurse Anesthetists Practicing in Anesthesia Care Settings. *AANA Journal*, 73 (6), 443-452.
- American Association of Colleges of Nursing. (2011). *Nursing Shortage Fact Sheet*. Retrieved April 20, 2011, from <http://www.aacn.nche.edu/media/factsheets/nursingshortage.htm>
- American Association of Nurse Anesthetists. (2010). *Certified Registered Nurse Anesthetists (CRNAs) at a Glance*. Retrieved February 5, 2011, from <http://www.aana.com/ataglance.aspx>
- American Association of Nurse Anesthetists. (2010). *CRNA Scope of Practice*. Retrieved May 19, 2011, from <http://www.aana.com/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=26268>
- American Association of Nurse Anesthetists. (2011). *E-Mail Survey Policy Fees and Agreement*. Retrieved November 30, 2011, from <http://www.aana.com/ProfessionalDevelopment.aspx?id=23278&terms=email+survey>
- Amundsen, S., & Corey, E. (2000). Decisions Behind Career Choice for Nurse Practitioners: Independent Versus Collaborative Practice and Motivational-Needs Behavior. *Clinical Excellence for Nurse Practitioners*, 4 (6), 309-315.
- Appalachian Regional Commission. (2011). *The Appalachian Region*. Retrieved March 3, 2011, from [http://www.arc.gov/appalachian\\_region/TheAppalachianRegion.asp](http://www.arc.gov/appalachian_region/TheAppalachianRegion.asp)
- Ball, J. (2003). *Understanding Herzberg's Motivation Theory*. Retrieved June 4, 2011, from [http://www2.accaglobal.com/students/acca/exams/f1/technical\\_articles/2945131](http://www2.accaglobal.com/students/acca/exams/f1/technical_articles/2945131)

- Coleman, C. (2008). Factors influencing nurse anesthetists' decision to practice in rural areas. M.S.N. dissertation, Mountain State University, United States -- West Virginia. Publication No. ATT 1453639.
- Dulisse, B., & Cromwell, J. (2010). No Harm Found When Nurse Anesthetists Work Without Supervision By Physician. *Health Affairs*, 29 (8), 1469-1475.
- Hogan, P., Seifert, R., Moore, C., & Simonson, B. (2010). Cost Effectiveness Analysis of Anesthesia Providers. *Nursing Economics*, 28 (3), 159-169.
- Loeffler, A. S. (1993). Job Satisfaction and Turnover of Nurse Anesthetists. Ph.D. dissertation, University of Pittsburgh, United States -- Pennsylvania. Publication No. AAT 9329480.
- O'Grady, E. T. (2008). *Advanced Practice Registered Nurses: The Impact on Patient Safety and Quality*. Retrieved December 7, 2011, from Agency for Healthcare Research and Quality: <http://www.ncbi.nlm.nih.gov/books/NBK2641/>
- Ryan, R., & Deci, E. (2000). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology*, 25 (1), 54-67.
- Seibert, E., Alexander, J., & Lupien, A. (2004). Rural nurse anesthesia practice: A pilot study. *AANA Journal*, 72 (3), 181-190.
- Soper, D. (2011). *Statistics Calculators*. Retrieved April 13, 2011, from <http://www.danielsoper.com/statcalc/>
- SPSS IBM Company. (2010). *SPSS Version 19*. Retrieved March 5, 2011, from <http://www.spss.com>

Syptak, J., Marsland, D., & Ulmer, D. (1999). *Job Satisfaction: Putting Theory Into Practice*.

Retrieved June 4, 2011, from <http://www.aafp.org/fpm/1999/1000/p26.html>

Szigeti, E., Largen, R., & Eberhardt, B. (1990). An Exploratory Study of the Correlates of Intent to Quit among Certified Registered Nurse Anesthetists in North Dakota. *The Journal of Rural Health, 6* (3), 317-327.

Vasu, M., Stewart, D., & Garson, G. D. (1998). *Organizational Behavior and Public Management*. New York, NY, United States: Marcel Dekker, Inc.

## APPENDIX A: COUNTIES IN APPALACHIA

**Alabama:** Bibb, Blount, Calhoun, Chambers, Cherokee, Chilton, Clay, Cleburne, Colbert, Coosa, Cullman, De Kalb, Elmore, Etowah, Fayette, Franklin, Hale, Jackson, Jefferson, Lamar, Lauderdale, Lawrence, Limestone, Macon, Madison, Marion, Marshall, Morgan, Pickens, Randolph, St. Clair, Shelby, Talladega, Tallapoosa, Tuscaloosa, Walker, and Winston

**Georgia:** Banks, Barrow, Bartow, Carroll, Catoosa, Chattooga, Cherokee, Dade, Dawson, Douglas, Elbert, Fannin, Floyd, Forsyth, Franklin, Gilmer, Gordon, Gwinnett, Habersham, Hall, Haralson, Hart, Heard, Jackson, Lumpkin, Madison, Murray, Paulding, Pickens, Polk, Rabun, Stephens, Towns, Union, Walker, White, and Whitfield

**Kentucky:** Adair, Bath, Bell, Boyd, Breathitt, Carter, Casey, Clark, Clay, Clinton, Cumberland, Edmonson, Elliott, Estill, Fleming, Floyd, Garrard, Green, Greenup, Harlan, Hart, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, Lewis, Lincoln, McCreary, Madison, Magoffin, Martin, Menifee, Metcalfe, Monroe, Montgomery, Morgan, Nicholas, Owsley, Perry, Pike, Powell, Pulaski, Robertson, Rockcastle, Rowan, Russell, Wayne, Whitley, and Wolfe

**Maryland:** Allegany, Garrett, and Washington

**Mississippi:** Alcorn, Benton, Calhoun, Chickasaw, Choctaw, Clay, Itawamba, Kemper, Lee, Lowndes, Marshall, Monroe, Montgomery, Noxubee, Oktibbeha, Panola, Pontotoc, Prentiss, Tippah, Tishomingo, Union, Webster, Winston, and Yalobusha

**New York:** Allegany, Broome, Cattaraugus, Chautauqua, Chemung, Chenango, Cortland, Delaware, Otsego, Schoharie, Schuyler, Steuben, Tioga, and Tompkins

**North Carolina:** Alexander, Alleghany, Ashe, Avery, Buncombe, Burke, Caldwell, Cherokee, Clay, Davie, Forsyth, Graham, Haywood, Henderson, Jackson, McDowell, Macon, Madison,

Mitchell, Polk, Rutherford, Stokes, Surry, Swain, Transylvania, Watauga, Wilkes, Yadkin, and Yancey

**Ohio:** Adams, Ashtabula, Athens, Belmont, Brown, Carroll, Clermont, Columbiana, Coshocton, Gallia, Guernsey, Harrison, Highland, Hocking, Holmes, Jackson, Jefferson, Lawrence, Mahoning, Meigs, Monroe, Morgan, Muskingum, Noble, Perry, Pike, Ross, Scioto, Trumbull, Tuscarawas, Vinton, and Washington

**Pennsylvania:** Allegheny, Armstrong, Beaver, Bedford, Blair, Bradford, Butler, Cambria, Cameron, Carbon, Centre, Clarion, Clearfield, Clinton, Columbia, Crawford, Elk, Erie, Fayette, Forest, Fulton, Greene, Huntingdon, Indiana, Jefferson, Juniata, Lackawanna, Lawrence, Luzerne, Lycoming, McKean, Mercer, Mifflin, Monroe, Montour, Northumberland, Perry, Pike, Potter, Schuylkill, Snyder, Somerset, Sullivan, Susquehanna, Tioga, Union, Venango, Warren, Washington, Wayne, Westmoreland, and Wyoming

**South Carolina:** Anderson, Cherokee, Greenville, Oconee, Pickens, and Spartanburg

**Tennessee:** Anderson, Bledsoe, Blount, Bradley, Campbell, Cannon, Carter, Claiborne, Clay, Cocke, Coffee, Cumberland, De Kalb, Fentress, Franklin, Grainger, Greene, Grundy, Hamblen, Hamilton, Hancock, Hawkins, Jackson, Jefferson, Johnson, Knox, Lawrence, Lewis, Loudon, McMinn, Macon, Marion, Meigs, Monroe, Morgan, Overton, Pickett, Polk, Putnam, Rhea, Roane, Scott, Sequatchie, Sevier, Smith, Sullivan, Unicoi, Union, Van Buren, Warren, Washington, and White

**Virginia:** Alleghany, Bath, Bland, Botetourt, Buchanan, Carroll, Craig, Dickenson, Floyd, Giles, Grayson, Henry, Highland, Lee, Montgomery, Patrick, Pulaski, Rockbridge, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe. The following independent cities in Virginia

are also within the Appalachian Region: Bristol, Buena Vista, Covington, Galax, Lexington, Martinsville, Norton, and Radford.

**West Virginia:** *All counties:* Barbour, Berkeley, Boone, Braxton, Brooke, Cabell, Calhoun, Clay, Doddridge, Fayette, Gilmer, Grant, Greenbrier, Hampshire, Hancock, Hardy, Harrison, Jackson, Jefferson, Kanawha, Lewis, Lincoln, Logan, Marion, Marshall, Mason, McDowell, Mercer, Mineral, Mingo, Monongalia, Monroe, Morgan, Nicholas, Ohio, Pendleton, Pleasants, Pocahontas, Preston, Putnam, Raleigh, Randolph, Ritchie, Roane, Summers, Taylor, Tucker, Tyler, Upshur, Wayne, Webster, Wetzel, Wirt, Wood, and Wyoming

**Source:** Appalachian Regional Commission. (2011). *The Appalachian Region*. Retrieved March 3, 2011, from [http://www.arc.gov/appalachian\\_region/TheAppalachianRegion.asp](http://www.arc.gov/appalachian_region/TheAppalachianRegion.asp)

## APPENDIX B: MAP OF APPALACHIAN COUNTIES



**Source:** Appalachian Regional Commission. (2011). *The Appalachian Region*. Retrieved March 3, 2011, from [http://www.arc.gov/appalachian\\_region/TheAppalachianRegion.asp](http://www.arc.gov/appalachian_region/TheAppalachianRegion.asp)

## APPENDIX C: INFORMED CONSENT LETTER

Dear CRNAs:

You are invited to participate in a research study titled “Factors that motivate Certified Registered Nurse Anesthetists to practice independently in the Appalachian region”. This study is being conducted by Michael Lee Frame, Jr., CRNA, MS and his research committee from the Charleston Area Medical Center (CAMC) School of Nurse Anesthesia and Marshall University. The present research available concerning the factors that motivate CRNAs to choose to practice in rural settings is limited. The purpose of this study is to identify and describe the factors that motivate CRNAs to practice independently in Appalachian healthcare facilities.

In this study, you will be asked to complete a survey. Your participation in this study is voluntary and you are free to withdraw your participation from this study at any time. If you decide to quit at any time before you have finished the survey, your responses will NOT be recorded.

The survey should take around 10 minutes to complete. Once you submit your completed survey, there will be no way to withdraw from the study because the survey contains no identifying information.

This survey has been approved by the Institutional Review Board of CAMC/West Virginia University Charleston Division. There are no risks associated with participating in this study. While you will not experience any direct benefits from participation, information collected in this study may benefit the profession of anesthesia in the future by better understanding the motivation of CRNAs in rural practice.

If you have any questions regarding the survey or this research project in general, please contact Michael Lee Frame, Jr., CRNA, MS at [mikerry617@yahoo.com](mailto:mikerry617@yahoo.com) or Dr. William White, CRNA, DMP at [bill.white@camc.org](mailto:bill.white@camc.org). If you have any questions concerning your rights as a research participant, please contact the CAMC Health Education and Research Institute - Office of Research and Grants at (304) 388-9970.

By completing and submitting this survey, you are indicating your consent to participate in the study. Your participation is appreciated.

Please click on the survey link below and provide us with your feedback no later than November 15<sup>th</sup>, 2011.

Michael Lee Frame, Jr., CRNA, MS – Doctoral Candidate  
Dr. William White, CRNA, DMP – Principal Investigator

APPENDIX D: MOTIVATION SURVEY OF  
INDEPENDENTLY PRACTICING CRNAs IN APPALACHIA

**Demographic Information**

1. Please indicate your gender. \* Male/Female\*
2. Please enter your age.
3. Please choose your marital status.  
\*Single/Married/Separated/Divorced/Widow/Significant other\*
4. Please choose your highest degree earned. \* Bachelor's/Master's/Doctorate

**Anesthesia Practice**

1. Please indicate your Certification Status. \*Certified/Recertified/Non-Recertified\*
2. Please enter yours years of CRNA experience.
3. Please enter the zip-code of your primary workplace.
4. Are you an Independent Anesthesia Provider (ie. a CRNA practicing without the supervision or medical direction of anesthesiologists)? \*Yes/No\*

Choose extent of agreement or disagreement from 1 (Strongly Agree) to 4 (Strongly Disagree)

1. The opportunity for *achievement* motivates me to practice independently.
2. The opportunity for *recognition* motivates me to practice independently.
3. The level of *responsibility* motivates me to practice independently.
4. The opportunity for *advancement* motivates me to practice independently.
5. The nature of the *work itself* motivates me to practice independently.
6. The *salary* motivates me to practice independently.
7. The *working conditions* motivate me to practice independently.
8. *Company/administrative policies* motivate me to practice independently.
9. No anesthesiologist *supervision* motivates me to practice independently.
10. *Interpersonal relations* motivate me to practice independently.

### **Additional Comments**

Do you have any further thoughts or ideas concerning what motivates CRNAs to practice independently?

## APPENDIX E: IRB APPROVAL CERTIFICATE



Charleston Area  
Medical Center



ROBERT C. BYRD  
HEALTH SCIENCES CENTER

OF WEST VIRGINIA UNIVERSITY/CHARLESTON DIVISION

September 7, 2011

William White, Jr., DMP, CRNA  
CAMC School of Nurse Anesthesia  
3110 MacCorkle Avenue SE  
Charleston, WV 25304

RE: Your application dated 9/7/2011 regarding study number 1997083: Factors that Motivate Certified Registered Nurse Anesthetists to Practice Independently in the Appalachian Region

Dear Dr. White:

I have reviewed your application for revision of the study listed above. The requested revision involves changes to the protocol. Your request is eligible for expedited review under FDA and DHHS (OHRP) regulations.

This is to confirm that I have approved your request for revision. The protocol is approved through the submission of Version 2: September 7, 2011 with an increase in the accrual goal from 400 to 5,000 subjects. Revisions to the protocol also included clarifications to the survey instrument, renaming and revising the cover email to reflect the AANA survey requirements. The accrual goal of 5000 is approved.

You are granted permission to conduct your study as revised effective immediately. The date for continuing review remains unchanged at , unless closed before that date.

Please note that any further changes to the study must be promptly reported and approved. Contact the CAMC/WVU Institutional Review Board office (304-388-9971; fax 304-388-9976) if you have any questions or require further information.

Sincerely,

A handwritten signature in cursive that reads "John C. Linton" with the initials "HKA" circled in the upper right corner.

John C. Linton, PhD  
Chair, Institutional Review Board

cc: Michael Frame, Jr., CRNA