Personality, addiction and anesthesia

JOHN P. McDonough, CRNA, EdD
Des Moines, Iowa

While substance abuse problems in the health care profession are not new, little documentation exists as to their prevalence among nurse anesthetists. There already exists considerable evidence that physician specialists in anesthesia are overrepresented in the population of physicians seeking treatment for drug and alcohol use. The purpose of this research was to explore factors related to personality and addictive tendencies that might predispose nurse anesthetists to substance abuse as well.

Of the 150 graduate nursing students in the study, those specializing in anesthesia \( n = 81 \) formed the study group while those pursuing general nursing graduate degrees \( n = 69 \) comprised the control group. Differences in the personality facets of impulsiveness, assertiveness and excitement seeking were measured using the NEO Personality Inventory. The addictive tendencies of the subjects were measured using the MacAndrew Scale taken from the Minnesota Multiphasic Personality Inventory.

In comparative analyses of the two groups, the anesthesia subjects exhibited a higher mean score for excitement seeking and a greater number of positive MacAndrew (addictive tendency) scores \( (22.2\% \text{ versus } 5.9\%) \). The findings also showed that subjects with positive MacAndrew scores generally had higher excitement seeking scores. It may be possible that this higher level of excitement seeking predisposes future nurse anesthetists to the development of addictive disorders.

Introduction and background

The problem of drug abuse among members of the medical profession is not a new one. Even in the preceding century, health care professionals were found to be at risk for substance abuse.\(^1,2\) For example, “morphinism” was noted at higher rates among individuals in medicine than among those in other fields.\(^2\) It was also not uncommon for physicians of the time to experiment with new drugs on themselves and on their colleagues.\(^3\) Dr. William Halstead, the New York surgeon credited with popularizing regional anesthesia in the United States, used cocaine outside of the clinical setting as a means of coping with the rigorous demands of his career.

Substance abuse continues to be a problem in the health care profession. An estimated 10-14% of physicians appear to be addicted to alcohol, drugs or both.\(^4\) Anesthesiologists have been shown to abuse substances at a higher rate than all other medical specialists with the possible exception of psychiatrists and are overrepresented in the group of physicians seeking treatment for addiction.\(^5,6\) Little quantitative documentation as to the prevalence of drug abuse among members of the nursing pro-
fession, particularly nurse anesthetists, can be found in the literature. However, the similarity of the nurse anesthetist's role to that of the anesthesiologist's would point to a similarity in risk factors for substance abuse.

A study of the factors associated with drug addiction among physicians has implications for the practice of nurse anesthesiaology. Borsay identified three factors contributing to substance abuse: (1) a preaddictive personality, (2) the availability of psychoactive drugs, and (3) the role strain associated with becoming or being a physician. According to Borsay, preaddictive personality traits and the accessibility of drugs alone did not seem to cause addiction; the necessary and primary ingredient was stress. In light of Borsay's findings, a specialization in nurse anesthesia would appear to place individuals at increased risk for drug abuse given the availability of drugs and, more importantly, the stress involved in anesthesia training and practice. Further investigation is needed relative to the personality traits and addictive tendencies that might predispose nurse anesthetists to addictive disorders.

The purpose of this study was to identify factors associated with what may well be a significantly higher rate of substance abuse among nurse anesthetists as compared to the general population of registered nurses. To that end, the study explored (1) differences in personality facets and addictive tendencies between graduate nursing students specializing in anesthesia and those pursuing general degrees, and (2) the relationships between specific personality facets and a general addictive tendency.

The level of drug and alcohol abuse among the nation's 1.7 million registered nurses has not been adequately documented. The information that does exist is more descriptive than quantitative in nature. Prior to the late 1970's, attempts to interest the nursing community in the study of drug and alcohol use by nurses were premature and only served to heighten anxiety. As a result, surveys related to substance abuse in the nursing population are not always reliable given the fear of legal and vocational reprisals.

The results of several research efforts point to the existence of a substance abuse problem. One survey reported that 17% of the nurses questioned expressed concerns relative to their own drug use. The same group, 6% showed clinical impressions of an abuse problem. In a study of an English alcoholism treatment program, 6% of the patients treated listed their occupation as nursing. If the categories of "unemployed" and "housewife" were not considered, nursing would rank as the third most highly represented occupational group presenting for treatment.

More recently, the profession has attempted to organize a response to the problem that would both protect the patient and treat the impaired professional. Drug and alcohol abuse, if left untreated, is destructive to both the practitioner and the entire profession. For example, in 1981, 67% of all disciplinary proceedings against nurses were related to chemical dependence. In some states, such as Florida, the rate was as high as 93%.

Education and specialized training do not protect health providers from developing conditions that compromise their ability to practice. Nurses, in general, are exposed to many stresses and are often faced with unresolvable conflicts. A profile of the typical drug-abusing nurse reveals an individual who graduated in the top one-third of his/her nursing class, holds an advanced degree, works in a high stress area, such as an emergency room, and is referred to as a "super nurse." Unlike individuals in the general population that might first use drugs for recreation or in response to peer pressure, nurses frequently report turning to drugs as a means of relaxing or of reducing pain.

While the literature contains little related to drug use, addictive tendencies or personality traits among nurse anesthesia students, it does reveal factors in nurse anesthesia education that might contribute to the problem of substance abuse. For example, one study conducted by Ward indirectly discusses the rate of drug use by nurse anesthesia students and nurse anesthetists. The study was undertaken to assess the extent of drug abuse in programs that were training physician anesthesiologists; however, the sample included nurse anesthetists and nurse anesthesia students as well as physicians. The results showed that 4.8% of the 1,914 nurse anesthetists surveyed and 2.8% of the 2,167 nurse anesthesia students were substance abusers. These figures are probably lower than the actual rates because they only reflect "confirmed cases" who have been referred for discipline and/or treatment. Most health care professionals come to treatment late in the course of the abuse problem. Also worthy of note is the differential rate between nurse anesthesia students and nurse anesthetists indicating that the abuse of drugs is not an experimental behavior associated with youth that might be outgrown with age and professional status.

In accounting for the higher rate of drug abuse among nurse anesthetists than among nurses in general, the stressful nature of the specialty training emerges as an important factor to consider. Wildgust studied the level of stress reported by nurse anesthesia students at different stages of their education. The study showed that marked stress was experienced by these students and that while
the stressors changed, the level of perceived stress remained constant throughout the nurse anesthesia program.

In a comparative study of nurse midwife and nurse anesthetist education programs, Holder looked at the anxiety levels of students in both of these specialties using the State-Trait Anxiety Scale and the Zuckerman Sensation Seeking Scale.21 No difference existed between the two groups on the measure of trait anxiety indicating that the base levels of anxiety in the personalities of the members of each group were probably equal. However, a difference between the two specialty groups did appear in the amount of state anxiety with the nurse anesthesia students exhibiting a higher level. This finding indicates that the education process in anesthesia is inherently more anxiety-provoking.

The anxiety resulting from the nurse anesthesia education program can be a source of psychological stress for the student. In people, as in physical systems, stress is an imbalance that seeks to be relieved; drugs often provide a means for this relief. What motivates individuals to enter a stress-producing specialty, such as anesthesia, and what causes some ultimately to abuse the tools of their profession are issues related to the personalities and addictive tendencies of these individuals.

It would not be expected that specialists in anesthesia, be they nurses or physicians, would be conversant in the current literature regarding the addictive process. Some of that information is provided here to allow the reader to more fully evaluate the information presented in this study. While some evidence has been presented showing a genetic and biological predisposition to alcoholism, many specialists advocate taking a broader perspective on substance abuse and view it as a symptom of psychological difficulty.22-24 Many conflicting statements exist in the literature regarding whether a particular type of personality can be identified with the premorbid state of the person who will eventually develop problems related to the abuse of alcohol or drugs. The search has been termed fruitless by some because "the investigation of any trait in alcoholics will show that they have more or less of it."25 Those with chronic drug dependence have been shown to exhibit a wide variety of personality styles and psychopathological conditions.26

Part of the confusion regarding personality traits of substance abusers is attributable to the variety of ways that personality can be explored in terms of both the theoretical orientation and the tools of the observer. For example, using primarily projective techniques, it was shown that alcoholics suffer from a marked weakness of ego organization.27 These findings, which were later confirmed using objective measures,28 would be most meaningful to a mental health professional who had a psychoanalytical orientation. Other studies of alcoholics have claimed that it is possible to classify both male and female alcoholics into at least nine separate subgroups of psychopathology.29

Attempts to uncover psychological differences between substance abusers and nonabusers have not always been successful. For example, in a study comparing delinquents who abused drugs with those who did not, no differences were found in attitudes, responses to frustration, self-esteem or perceived locus of control.30 It must be noted, however, that the psychological parameters measured might have been more of a propensity for delinquency than for substance abuse. The question of whether or not there actually is a prealcoholic personality can be answered only through a longitudinal study in which the factors measured are not a function of the alcohol or substance abuse in progress.

For alcoholics, the Depression (D) Scale and the Psychopathic deviate (Pd) Scale on the Minnesota Multiphasic Personality Inventory are elevated but decline during and after treatment. As a result, it cannot be stated that such elevations are diagnostic of the prealcoholic personality; instead, they reflect the problem related to the abuse of alcohol.31 Although the D Scale is elevated, the level of depression cannot be directly correlated to the amount of alcohol use.32

Substance abuse is often seen concurrently with other manifestations of psychological distress. For example, it has been demonstrated that 32% of alcoholics had neurotic disorders.33 What is not clear, however, is if these disorders preceded the substance use. It has been shown that these neurotic disorders increase in severity as the abuse increases.34

Although a specific personality type that can be used to identify the premorbid abuser cannot be found in the literature,35 traits common to abusers of alcohol, drugs and tobacco are emerging. Certain aspects of personality may define a latent but powerful predisposition to drug abuse.36 These traits include extraversion, impulsivity and the seeking of experiences, as well as behaviors such as acting out and nonconformity.37, 38 A comprehensive study of males and females in the United States and Great Britain demonstrated a high correlation between impulsivity and sensation seeking and the use of alcohol or drugs.39

Objective measures of personality have been used to determine the relationships of specific traits to substance abuse. For example, when the Zuckerman Sensation Seeking Scale (SSS) was adminis-
tered, it was found that those who scored high also had a higher rate of both drug and alcohol abuse. More recently, these findings were confirmed in other studies which revealed not only elevations on both the Sensation Seeking Scale and measures of drug experiences but also a high correlation between the two results. Taking drugs appears to be an acceptable way for some individuals to achieve the new sensation-producing experiences that they desire.

Research using a specific group of drug users revealed an elevation on all four SSS scales but particularly those measuring thrill and adventure seeking and experience seeking. Extraversion has been shown to correlate with impulsiveness. Other researchers have also noted that substance users are impulsive and strive for a broad variety of experiences. When the hypothesis correlating impulsivity, extraversion and experience seeking with substance use was tested in subjects with nicotinism (habitual smokers of cigarettes), a positive correlation was found; a similar correlation was noted as a result of applying the above measures to drug and alcohol users.

The findings, however, are not universal. Other researchers have been unable to discover a specific correlation between drinking levels and the degree of measurable extraversion. While correlations have been identified between certain traits and substance use, it should be noted that correlation does not imply causation. Personality is a complex structure shaped by many factors. Because many structural parameters cannot be isolated in trait study methodology, those parameters that may be sufficiently powerful to predispose an individual to substance use are difficult to define.

Methodology

This study was designed to measure three facets of personality—impulsiveness, assertiveness and excitement seeking—as well as addictive tendencies in graduate students specializing in nurse anesthesia. Comparisons were made between a study group and a control group to determine potential differences in personality and addictive tendencies. Relationships that might exist between a predisposition toward substance abuse and any of the three personality facets were also considered.

Two groups of university students similar in educational and professional backgrounds participated in the study. Members of the two groups were all registered nurses and held bachelor's degrees. The subjects in the control group were pursuing masters' degrees in nursing while those in the study group were seeking masters' degrees in nurse anesthesia. By using students as subjects rather than practicing nurse anesthetists, any effect of the long-term practice of the anesthesia specialty was eliminated.

The instrument administered was derived from a combination of questions that comprise two personality inventories. The first set of questions used to measure the three personality facets of impulsiveness, assertiveness and excitement seeking were taken from the NEO Personality Inventory (NEO-PI). Based on a model that considers the personality to be made up of three domains, namely neuroticism, extraversion and openness, the NEO-PI, in its entirety, measures a total of 18 facets within those broad domains. Validity of the results of the NEO-PI are demonstrated by its significant (p < .01) correlation with the results of other well-accepted measures, such as the Eysenck Personality Inventory and the Guilford-Zimmerman Temperament Scale. Further validation is provided on the basis of other studies of consensual validity that showed high correlation between subjects' self-reports and those ratings achieved by spouses (p < .001) and peers (p < .001). The calculation of Cronbach's coefficient alpha for each of the three facet scales in the study instrument completed by the subjects demonstrated that a consistency existed with the normed values and that the questions, when abstracted from the complete NEO-PI, retained comparable validity.

The second series of questions was drawn from the Minnesota Multiphasic Personality Inventory (MMPI). Fifty-one of the MMPI questions comprise the MacAndrew Scale. Unlike the "clinical" scales of the MMPI which should not be interpreted literally, the MacAndrew Scale is a "supplemental" scale that was specifically designed to detect alcoholics and does so more than 80% correctly. Subsequent to its development, it was shown that this scale can also identify drug abusers as well as alcoholics, but it cannot distinguish between the two. This has lead to the claim that rather than alcoholism, this scale actually measures a generalized addictive tendency. Furthermore, it was also shown that the MacAndrew Scale not only accurately identifies alcoholics and drug abusers who are currently abusing alcohol or drugs, but it will also predict those who may become symptomatic later in life, even though they were not at the time of test administration.

Included in the instrument was a question that asked subjects in the nursing program whether or not they would have elected to attend a nurse anesthesia program had one been available to them. Those subjects who answered this question in the affirmative were eliminated from the study group. In this way the control group was kept free of stu-
The instrument was administered to each of the two groups of subjects at their respective schools. A total of 150 subjects participated in the study with 69 in the control (nonanesthesia) group and 81 in the experimental (anesthesia) group. To complete the profile of each subject, demographic data were also gathered; this information consisted of age, sex and length of time spent as a registered nurse.

**Data analysis**

The subjects received scores for the four parameters being measured—impulsiveness, assertiveness, excitement seeking and addictive tendency. The scores of the sample were divided into two specialty groups according to whether or not the subjects were nurse anesthesia students. To determine what differences, if any, existed between the two groups, the scores for each of the four measures were compared. Possible associations between any of the personality trait scores and the scores on the MacAndrew Scale were also investigated.

Descriptive statistics were calculated for each of the four measures. A multivariate analysis of variance (MANOVA) was used to determine if a difference existed between all of the three personality facets and the MacAndrew Scale score when the subjects were separated into groups according to such categorical variables as sex and type of educational program.

**Results**

The demographic data summarized in Table I provides a profile of the subjects in both the study and control groups. The sample of nurse anesthesia students was comprised of 26 males and 55 females with the mean age being 29.85 years old. The average length of time the subjects spent as registered nurses was 6.03 years. The sample of general nursing students was made up of 4 males and 65 females with the mean age for the group being 35.47 years old. The subjects had been registered nurses for an average of 12.16 years.

Potential differences between the nursing specialty groups relative to the three personality facets measured by the NEO-PI were explored. The results of a MANOVA presented in Table II reveal an overall significance (F = 16.08, p = .000). More specifically, a univariate analysis between the anesthetic...
sia study group and the nonanesthesia control group showed there was no difference in impulsiveness (p = .792). In terms of assertiveness, the mean scores for the nonanesthesia nursing students were significantly higher than those for the anesthesia students (p = .002). Finally, differences were also evidenced for the excitement seeking traits with a higher mean score reported for the anesthesia study group than for the nonanesthesia control group (p = .000).

On the basis of the MacAndrew Scale, the existence of difference in addictive tendency between the anesthesia study group and the nonanesthesia control group was investigated. The raw MacAndrew Scale score for each subject was converted to either a “positive” result (raw = 23 or more) or a “negative” result (raw = 22 or less) and a comparison of “positive” scores was made. (Table I). In the anesthesia group (n = 81), 22.2% of the subjects had positive scores while in the nonanesthesia group (n = 69), 5.9% had positive scores. The Pearson chi-square was 8.03 (p = .004) indicating a statistically significant difference in addictive tendency. The Estimated Index of Risk for students in the anesthesia group was 3.7, making them 3.7 times more likely to achieve a positive MacAndrew Scale score.

The relationship between addictive tendency, as measured by the MacAndrew Scale, and the personality facets of impulsiveness, assertiveness and excitement seeking, as measured by the NEO-PI, were also investigated. The subjects were divided into groups according to whether they had scored positively or negatively on the MacAndrew Scale and comparisons were made in terms of the three personality facets (Table III). While the overall MANOVA was significant (p = .032), no differences were found between the two groups in the areas of impulsiveness (p = .664) or assertiveness (p = .784). However a significant difference emerged in terms of excitement seeking (p = .008). Those with positive MacAndrew Scale scores, the vast majority of which were anesthesia students, tended to have higher excitement seeking scores.

The fact that there was a larger percentage of males in the anesthesia group may lead to the concern that the difference between groups (anesthesia versus nonanesthesia) may be a function of sex difference rather than specialty choice. To examine such a rival hypothesis, sex was eliminated as a confounding variable by reanalysis of the data concerning personality facets after males had been eliminated. The results were unchanged in that the anesthesia group remained with significantly higher scores in excitement seeking, lower scores in assertiveness and no difference in impulsiveness.

To discount the possibility that the anesthesia group had a higher percentage of positive MacAndrew Scale score because there were more males in the anesthesia group, a hierarchical loglinear analysis was undertaken. Utilizing backward elimination, the most of best fit was constructed. The effect of sex as a predictor of addiction score was found not to be significant. The model that used only specialty choice (anesthesia versus nonanesthesia) as predictor fit the data well with a Pearson chi-square measuring goodness-of-fit that approached 1 (p = .857).

**Discussion**

Findings from this study provide insight into the personality facets that distinguish nurse anesthetists from nurses, in general, as well as into the factors that might predispose nurse anesthetists to substance abuse because of the association of at least one of these personality facets, namely excitement seeking, with a positive addiction score. The most notable difference between the study and control groups was in the area of excitement seeking (p = .000). The magnitude of this difference cannot be attributed to sex. Although there were a greater number of males in the anesthesia group, a comparison study of males and females yielded no signifi-

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<th>Table III</th>
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<td><strong>Personality facets by McAndrew score (positive/negative)</strong></td>
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<th>Variable</th>
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<tr>
<td></td>
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<td>Excitement seeking</td>
<td>19.62</td>
<td>16.64</td>
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**MANOVA**—multivariate analysis of variance

**ANOVA**—analysis of variance
cant differences in excitement seeking scores. The elevation in the excitement seeking score appears to be more a function of nursing specialty than of sex difference. In light of this, it should be noted that the literature supports a positive correlation between high scores on the Zuckerman Sensation Seeking Scale and high levels of drug and alcohol use.40,42

A consideration of addictive tendency shows that a greater number of subjects in the anesthesia study group (22.2%) than in the nonanesthesia control group (5.7%) had positive MacAndrew Scale scores. The findings are consistent with those demonstrating an overrepresentation of anesthesiologists in addiction treatment programs and with the results of a survey in which 6% of a group of nurses indicated clinical impressions of a substance abuse problem.6,10 In addition, this study confirms the profile of nurse anesthetists as exhibiting characteristics typical of nurses who are most likely to become addicted.18,57 It is difficult to generalize the results of these studies to nursing students outside the control group because of the lack of reliable data concerning addiction problems among nursing students in general.44 However, it can be stated that the MacAndrew Scale seems to measure a tendency toward substance abuse problems in a population of nurses.

Viewed in their totality, the results of this study suggest that the graduate nursing students studied, specializing in anesthesia, are at significantly increased risk for the development of addictive disorders when compared to the nonanesthesia nursing students studied. As was noted previously, students in the anesthesia study group had high excitement seeking scores, as well as a significant number of total positive scores on the MacAndrew Scale. In view of the association of "sensation seeking" with the use of drugs and alcohol and of the potential ability of the MacAndrew Scale to predict future addiction problems, the probability that graduate students in nurse anesthesia are more susceptible to substance abuse may be substantiated.

Acknowledgement of the risk factors for drug abuse in the field of nurse anesthesia carries with it the responsibility of creating educational programs that prepare the practitioners to recognize the dangers inherent in their chosen profession. A lack of adequate education about addiction coupled with role strain have been shown to predispose nurses to substance abuse.66 The approach to increasing awareness should include an emphasis on both individual and peer recognition of the problems. If a program of education relative to addiction were incorporated in the overall nurse anesthesia program, the student would be better able to recognize the pitfalls that may lie ahead and, hopefully, avoid them.

The stress of anesthesia education could be reduced through the creation of structured support systems designed to help students find means other than drugs for dealing with role strain. Further, such a support system could be used to develop general coping mechanisms that can be applied to the individual's experiences as a student and later as a practitioner. The need for drug awareness programs is further corroborated by a series of interviews with drug-abusing anesthetists who emphasized the importance of incorporating educational programs on addiction in the curricula of anesthesia programs.60

While there is no way to remove the role strain from the practice of anesthesia, it may be possible to teach coping and adapting skills to nurse anesthesia students so they will be better able to deal with the inherent stresses of their profession. It is hoped that such a program would not only enable these students to be more resistant to addictive disorders, but would also help them develop the skills needed on a personal level to become more fulfilled and functional individuals.

REFERENCES