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Addiction and Substance Abuse in Anesthesiology

Ethan O. Bryson, M.D., Jeffrey H. Silverstein, M.D.†*

Despite substantial advances in our understanding of addiction and the technology and therapeutic approaches used to fight this disease, addiction still remains a major issue in the anesthesia workplace, and outcomes have not appreciably changed. Although alcoholism and other forms of impairment, such as addiction to other substances and mental illness, impact anesthesiologists at rates similar to those in other professions, as recently as 2005, the drug of choice for anesthesiologists entering treatment was still an opioid. There exists a considerable association between chemical dependence and other psychopathology, and successful treatment for addiction is less likely when comorbid psychopathology is not treated. Individuals under evaluation or treatment for substance abuse should have an evaluation with subsequent management of comorbid psychiatric conditions. Participation in self-help groups is still considered a vital component in the therapy of the impaired physician, along with regular monitoring if the anesthesiologist wishes to attempt reentry into clinical practice.

FIFTEEN years after the original article, "Opioid Addiction in Anesthesiology,"[1] was published, addiction still remains a major issue in the anesthesia workplace. Between 1991 and 2001, 80% of US anesthesiology residency programs reported experience with impaired residents, and 19% reported at least one pretreatment fatality.[2] Substantial advances have occurred in our understanding of addiction as well as both the technology and therapeutic approaches used to fight this disease, although outcomes have not appreciably changed. Starting with a brief review of the basic concepts of addiction, this article highlights the current thoughts regarding the pathophysiologic basis of addiction, as well as clinical manifestations, legal issues, and treatment strategies.

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Additional material related to this article can be found on the ANESTHESIOLOGY Web site. Go to http://www.anesthesiology.org, click on Enhancements Index, and then scroll down to find the appropriate article and link. Supplementary material can also be accessed on the Web by clicking on the "ArticlePlus" link either in the Table of Contents or at the top of the Abstract or HTML version of the article.

Anesthesiologists (as well as any physician) may suffer from addiction to any number of substances, though addiction to opioids remains the most common. As recently as 2005, the drug of choice for anesthesiologists entering treatment was an opioid, with fentanyl and sufentanil topping the list.[3] Other agents, such as propofol, ketamine, sodium thiopental, lidocaine, nitrous oxide, and the potent volatile anesthetics, are less frequently abused but have documented abuse potential.[4] Alcoholism and other forms of impairment impact anesthesiologists at rates similar to those in other professions.[5] Factors that have been proposed to explain the high incidence of drug abuse among anesthesiologists include the proximity to large quantities of highly addictive drugs, the relative ease of diverting particularly small quantities of these agents for personal use, the high-stress environment in which anesthesiologists work, and exposure in the workplace that sensitizes the reward pathways in the brain and thus promotes substance abuse.[6]

It is not the purpose of this article to present a manual for the treatment of addiction. Treatment should be administered by qualified personnel. All anesthesia personnel, however, should be aware of the basic nature of the problem and possess the necessary information to recognize and assist an impaired colleague.

Prevalence

There are limited data available to determine the current prevalence of drug use by anesthesia personnel. Records of disciplinary actions, mortality statistics, and registries for known addicts provide some information, but it is difficult to interpret these types of data in that there is no guarantee that all cases are reported and the total population out of which the reports emanate is rarely available. In the past, it had been concluded that the true prevalence of addiction in physicians is un-

* Assistant Professor, † Professor.

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Address correspondence to Dr. Bryson: Mount Sinai Hospital, Department of Anesthesiology, One Gustave L. Levy Place, New York, New York 10029. ethan.bryson@mountsinai.org.

known,[7] though it had been suggested that drug abuse is at least as prevalent as among the general population.[8]

A review of 1,000 treated physicians conducted by Talbott *et al.*[9] in 1987 suggested that addiction is common among anesthesiologists. Anesthesia residents represented 33.7% of all residents presenting for treatment but composed only 4.6% of all US resident physicians at the time of the study, thus presenting an apparent 7.4-fold increased prevalence of anesthesia residents in the study population.[1] Subsequent studies have consistently differed from the results of Talbott *et al.* Five years later, a study by Hughes *et al.*[5] found the rate of substance abuse in the anesthesia resident population to be no higher than that of other specialties. Interestingly, this same study showed higher rates of substance abuse among emergency medicine and psychiatry residents. In 2000, Alexander *et al.*[10] published a study examining the cause-specific mortality risks of anesthesiologists that suggested that the risk of drug-related death among anesthesiologists is highest in the first 5 yr after medical school graduation, and remains increased over that of other physicians. Most recently, a survey conducted in 2002 by Booth *et al.*[11] found the incidence of known drug abuse among anesthesia personnel to be 1.0% among faculty members and 1.6% among residents.

Etiology

In 1956, the American Medical Association declared alcoholism to be an illness,[12] and in 1987, it extended the declaration to include dependence on all drugs. There have been many theories regarding the etiology of chemical dependence,[13] including biochemical, genetic, psychiatric, and, more recently, exposure-related theories.[6] None alone has been able to identify specific causes, only to suggest what may increase the risk of developing addiction among anesthesia personnel.

Genetic and Biochemical Theories

Considerable research done in mice suggests a genetic basis for addiction. Tapper *et al.*[14] engineered mutant mice with α_4 nicotinic subunits that contained a single point mutation, Leu9′ → Ala9′, in the pore-forming M2 domain. The resulting nicotinic acetylcholine receptors were hypersensitive to nicotine, with the mutant mice exhibiting reinforcement in response to acute low-dose nicotine administration. It is this exaggerated response to lower levels of stimuli that is thought to be important in the development of dependence in susceptible individuals. Tolerance and sensitization elicited by chronic nicotine administration were also observed, suggesting the possibility that behaviors associated with the use of drugs of abuse may be reinforced by much smaller doses in some persons who are genetically susceptible but not in others who do not share this genetic predisposition.

There is strong evidence to suggest that drugs of abuse that activate the reward structures in the brain induce lasting changes in behavior that reflect changes in neuron physiology and biochemistry.[15] Although the majority of individuals who experiment with psychoactive substances do not become dependent, there exists a subset of individuals who do. These individuals typically exhibit preexisting comorbid traits such as novelty-seeking and antisocial behavior, and there seems to be a genetic basis for both the susceptibility to dependence and these comorbid traits.[16] According to one recent study, this genetic susceptibility plays a role in the transition from substance use to dependence and from chronic use to addiction.[17] Many genes have been identified as possibly playing a role in the susceptibility to drug addiction, but as of this publication, investigators have been able to identify a functional mechanism related to the specific effects of abused drugs in only a few.[18]

Release of the neurotransmitter dopamine in the mesolimbic system of the brain is involved with the reinforcement of drug-seeking behaviors associated with several drugs of abuse, including nicotine. Picciotto *et al.*[19] reported on mice lacking the β_2 subunit of the high-affinity neuronal nicotinic acetylcholine receptor. They found that mesencephalic dopaminergic neurons from mice without the β_2 subunit did not respond to nicotine, as did neurons from wild-type mice. The self-administration of nicotine was observed to be attenuated in these mutant mice.

In humans, the cholinergic muscarinic 2 receptor has been associated with the function of memory and cognition. Wang *et al.*[20] reported that variation in the gene responsible for the production of this receptor predisposed to both alcohol dependence and major depressive syndrome. Luo *et al.*[21] looked at the relations between the variations in the cholinergic muscarinic 2 receptor gene and alcohol dependence, drug dependence, and affective disorders in a population of 871 subjects and identified specific alleles, genotypes, haplotypes, and diplotypes significantly associated with risk for either dependence or affective disorders. Because there is empirical evidence that the disorders of substance abuse are prevalent within multiple generations of some families, it makes sense that there should be some associated genetic component. How much of a role this component plays in the development of the disease is not yet known, because there are many factors that contribute to the development of a substance use disorder in a predisposed individual.

Psychiatric Comorbid Conditions

There is considerable association between chemical dependence and other psychopathology. A 1991 review of the data found personality disorders in 57 of 100 substance abusers.[22] Of physicians admitted to one in-

patient drug/alcohol treatment facility in 1984, 5.9% had a primary psychiatric diagnosis as well as chemical dependence.[23] Therefore, it has been suggested that one source of motivation for the self-administration of drugs of abuse is the self-medication of symptoms associated with comorbid psychiatric disorders.[24] The observation that individuals with the same personality traits tend to self-administer drugs from the same class, *i.e.*, opioids for anxiety and depression and amphetamines for attention deficit and hyperactivity states, lends credence to this theory. Individuals under evaluation for or treatment for substance abuse should have an evaluation with subsequent management of comorbid psychiatric conditions.

Exposure-related Theories

It has been suggested that emotional stress and access to agents may play much less of a role in the development of addiction than was previously thought. Gold *et al.*[6] presented the hypothesis that the increased risk of addiction in certain occupational settings, such as within the practice of anesthesiology, is related to exposures that sensitize the reward pathways in the brain to promote substance use. It is known that drugs of abuse physically alter the chemistry of the addicted brain, changing the relative levels of the neurotransmitters γ-aminobutyric acid, dopamine, and serotonin associated with reward pathways such that drug-seeking behavior is favored over the rational evaluation of the risks of such actions.[25–27]

Gold *et al.* suggest that anesthesiologists who become addicted through such sensitization in the workplace may continue to use the agents to alleviate the withdrawal they feel when away from the exposure. The evidence to suggest this mechanism of addiction is based on the observation that low doses of opiate drugs can induce sensitization, and these agents are present and measurable in the exhaled breath of patients receiving them.[28] However, these chemical changes result from levels of exposure typically associated with active use of drugs of abuse and not from the trace levels found in the work environment, and it is not made clear how the transition to active use of these agents occurs. This is certainly a novel and relatively new idea, and considerable research needs to be conducted in this area before any conclusions can be made regarding its validity.

Clinical Manifestations

Although not one of the specific criteria for diagnosis of drug-related disorders, denial can present a major obstacle to treatment of the addicted physician.[29] The addict does not recognize that he or she has a problem, and treatment is seldom spontaneously sought. Denial is not lessened by education and training, and some have even suggested that physicians and other highly educated and highly functioning addicts may have a well-developed denial mechanism in place.[29] Physician–patients are often described as having grandiose ideas of invulnerability and self-sufficiency, and as unable to accept that abuse leads to addiction and that addiction is loss of autonomy.[30]

Denial is not limited to the addict.[1] Coworkers, friends, relatives, and associates will often make excuses for or prefer not to deal with the impaired physician.[31] It can be difficult to accept that a problem in a colleague is a result of addiction, but failure to initiate an investigation because of "uncertainty" masked as concern for the individual is denial.

Behavior Patterns

Because of the unique proximity of the chemically dependent anesthesiologist to his or her drug of choice while at work, behaviors that would arouse suspicion in another setting may make the addicted physician seem quite functional. The addicted anesthesiologist becomes extraordinarily attentive at work as maintaining a job in close proximity to the source of drugs becomes more important than aspects of the individual's personal life. Changes in behavior are frequently noted, with periods of irritability, anger, euphoria, and depression common.

Often it is the individual with this disorder who is the last to recognize that a problem exists. It is therefore imperative that those people most likely to observe the signs and symptoms of addiction, *i.e.*, the relatives, friends, and coworkers, gain a clear understanding of the disease and understand what to do if they suspect someone may have a problem. Early identification of the affected individual can often prevent harm, both to the impaired physician and to his or her patients. Early detection is often difficult because of the compartmentalized relationships the individual may have with different members of their social structure. The spouse of an addict may observe behavioral changes that may pass unnoticed by colleagues at work, and the entire picture is seldom appreciated by any one person.

Some of the changes typically observed in the affected anesthesiologist include but are not limited to the following[32]:

- Withdrawal from family, friends, and leisure activities
- Mood swings, with periods of depression alternating with periods of euphoria
- Increased episodes of anger, irritability, and hostility
- Spending more time at the hospital, even when off duty
- Volunteering for extra call
- Refusing relief for lunch or coffee breaks
- Requesting frequent bathroom breaks
- Signing out increasing amounts of narcotics or quantities inappropriate for the given case
- Weight loss and pale skin

The period of time over which these changes are manifested depends on the drug to which the individ-

ual has become addicted. Alcohol addiction typically takes years to become apparent, whereas addiction to the short-acting opioids, fentanyl and especially sufentanil, becomes apparent over the course of a few months of use.

So powerful is the disease of addiction and the need for the drug that otherwise reasonable and intelligent people will resort to seemingly incredulous behavior to obtain their drug of choice. Addicts may chart the use of an agent when in fact either an alternate agent or none at all was administered. Entire cases may be done with inhalational agents and β-blockers and charted as opioid based. Addicts may substitute a syringe containing their drug of choice for one containing saline or a mixture of lidocaine and esmolol during a relief break. Some have admitted to rummaging through sharps containers looking for residual drug in discarded syringes. Addicts quickly become proficient at removing controlled substances from secure places. The security features of automated dispensing machines are easily defeated, and drugs may be removed from glass ampules and replaced with another liquid without evidence of tampering.

Depending on the half-life of the abused agent, tolerance can develop rapidly. It is not uncommon for the addict in recovery to report self-administration of 1,000 μg fentanyl in a single injection, often simply to relieve the symptoms of withdrawal. When looking over the records of an addicted anesthesiologist, an increase in the quantity of opioids requested, particularly on Fridays, can often be noted.

Legal Issues

When dealing with an addicted physician, there are a number of legal issues to consider. The physician who is reported to either the state board of medicine or a physician referral program faces a series of legal choices. Consultation with legal counsel in these matters is mandatory for both the reported physician and the institution involved with reporting the physician, because an individual's license to practice medicine is in jeopardy.[1] As well, failure to report an impaired colleague may be considered negligence and leaves the individuals and institutions involved open to questions of liability should harm come to any patient. It is important to note that the legal requirements and protections associated with physician impairment are different from state to state. This is particularly true for confidentiality of records and the relation of Impaired Physicians Programs to licensure boards.[1] This section explores these issues but should not be construed as legal advice.

Diversion/Impaired Physicians Programs

The medical licensing board of each state may suspend or revoke an individual's license to practice medicine. In addition to actions against licensure, state, local, and federal authorities may institute criminal action associated with an individual's actions, including charges for diversion of controlled substances. As an alternative to suspension or revocation, state medical societies are allowed, under certain circumstances, to enroll physician addicts into diversion programs designed to rehabilitate the affected physician and return him or her to the practice of medicine. Enrollment in these programs is "voluntary," though nonparticipation almost always results in the case being turned over to the state licensing board. Although the licensing agencies are generally reluctant to accept any diminution of authority, they recognize that professional societies are more easily able to engage impaired colleagues. Many state Impaired Physicians Programs have now negotiated a significant responsibility for the investigation, intervention, and diversion in reported cases of impairment.[33–35]

In this instance, diversion is defined as the process of intervening in the case of a physician or nurse and arranging for assessment, treatment, and potentially return to practice independent of licensure authorities. The potential for involving licensure authorities represents the coercive power of diversion programs.[1] The relation between an Impaired Physicians Program and its associated licensing board is highly variable from state to state, and subject to constant reassessment.[36]

Although the issue of board certification is somewhat separated from that of medical licensure, it is the policy of the American Board of Anesthesiology (ABA) that a physician must maintain a permanent, unconditional, and unrestricted license to practice medicine in at least one state in the United States to maintain board certification. The ABA recently clarified its position on revocation of ABA certification for physicians involved in diversion programs in a recent issue of *ABA News*. According to the article, "It is the policy of the ABA that participation in an approved treatment plan for impaired physicians is not considered a restriction on a medical license in and of itself. If a state medical licensing board permits the practice of medicine while a physician is compliant with an approved rehabilitation plan, the ABA will allow certification to be maintained."[37]

State medical society diversion programs are available to provide consultation concerning intervention strategies, state-specific legal considerations, and reporting requirements. Some Impaired Physicians Programs sponsor group-therapy sessions for recovering health professionals.[1] Impaired Physicians Programs can be a great information resource, providing listings of available self-help groups, therapists, treatment centers, sources of legal advice, and urine monitoring programs.

Additional information regarding the state society programs that assist impaired physicians and nurses, including contact information and Web site addresses,

is available on the ANESTHESIOLOGY Web site at http://www.anesthesiology.org.

Confidentiality

Once involved in treatment, physicians are expected to share their experiences with addiction and substance abuse openly with peers and therapists through group therapy and participation in anonymous self-help groups such as Alcoholics Anonymous (AA) or Narcotics Anonymous (NA). In 1996, Roback *et al.*[38] examined the confidentiality dilemmas that exist in group psychotherapy with recovering physicians and found that because of the risk of personal and professional harm, participants remained exceedingly concerned about breaches of confidentiality. Because the current law provides little protection to physicians who enter group therapy, perhaps improving legislation would result in greater or more honest disclosure in the group setting.

Mandatory Reporting and Immunity

Failure to report an impaired physician as required by law may result in disciplinary action against the institution or designated individual.[1] Many of these laws provide immunity for persons who report an impaired professional; however, some specifically do not. Each state has its own laws regarding mandatory reporting and immunity.[39] For example, under Colorado law, addiction to alcohol or drugs is classified as unprofessional conduct, which therefore must be reported to the licensing board.[40] Under most circumstances, the individual making such a report is immune from civil suit over this action so long as it is made in good faith. There are reporting exceptions for the treating physician of the addicted physician–patient, so long as the physician–patient is not a danger to his or her patients.

The National Practitioner Data Bank functions as a repository for information regarding professional conduct, licensure status, and malpractice claims of the nation's physicians.[1] Voluntary entry into a substance abuse treatment program is not reportable to the National Practitioner Data Bank. As well, voluntary surrender of a medical license during treatment may not require reporting, but suspension of a physician's clinical privileges (*e.g.*, by a hospital) for greater than 30 days does.[1] Individuals wishing to make such a report should be familiar with the laws in their state of practice.

The Americans with Disabilities Act

The Americans with Disabilities Act, enacted in 1992, offers some protections to the addicted physician, though it should be noted that the protections offered by the Americans with Disabilities Act are limited in scope and are applied differently to individuals who are dependent on alcohol *versus* illegal drugs.‡ No protection is afforded to the user of substances other than alcohol unless he or she is currently in a treatment program, whereas the alcohol-dependent person need not be in treatment to be protected under this act. Recent case law has reduced these limited protections afforded by the Americans with Disabilities Act to addicted persons.[41] The Contract with America Advancement Act of 1996 removed substance use disorders as a valid cause of disabling impairment. If the addictive disorder exists in the presence of other psychiatric or medical disorders, the individual may qualify for protection if the individual would remain disabled if he or she stopped using alcohol or drugs.[42] As well, the presence of a substance-related disorder will not, by itself, allow an individual to collect disability benefits under the Veterans Administration unless another psychiatric or medical condition is also present, because of the determination by the US Supreme Court that a alcoholism involves an act of willful misconduct, which violates Veterans Administration regulations.[43]

To the extent that these regulations apply to the anesthesiologist in recovery, it should be understood that relapse presents a significant clinical risk and danger. The first symptom of relapse in an extraordinarily high number of cases involving the return of a fentanyl-addicted anesthesiologist to the operating room anesthesia practice has been death.[44] We may define disability as being unable to perform all or some aspects of a specific job, such as those required of an anesthesiologist, because the individual is disabled by active addiction, the need to receive treatment, or the need to pursue time-intensive recovery activities that may preclude work. Disability related to the potential for relapse, or a "prophylactic" disability, which is a very real concern when the anesthesiologist in recovery returns to the clinical practice of anesthesia, is generally not covered.[39]

Diagnosis and Treatment

An addiction psychiatrist should direct diagnosis and treatment. In 1993, addictionology was a relatively new specialty, with addiction psychiatry formally recognized by the American Board of Medical Specialists in 1992. The American Board of Psychiatry and Neurology began offering added qualifications in addiction psychiatry in 1993 and, although not recognized by the American Board of Medical Specialties at the time, the American Society of Addiction Medicine established a credentialing and examination process for its members. Currently, the American Board of Psychiatry and Neurology recognizes addiction psychiatry as a subspecialty of psychiatry that focuses on evaluation and treatment of individuals

‡ Further information regarding the implications of the Americans with Disabilities Act may be obtained from the Civil Rights Division of the US Department of Justice, Washington, D.C., at: http://www.usdoj.gov/crt/. Accessed June 22, 2008.

with alcohol, drug, or other substance-related disorders and of individuals with dual diagnosis of substance-related and other psychiatric disorders. An addiction psychiatrist referral may be obtained from drug treatment centers, the American Society of Addiction Medicine, or state Impaired Physicians Programs.

Initial Therapeutic Period

Once it has been established that a physician is impaired and requires treatment for addiction, a referral is made to an inpatient facility that specializes in the treatment of physicians. It is important that such a facility is chosen so that the affected individual may develop the support of other similarly affected physicians.[45] Although there are currently no programs in the United States that admit only physicians, several are available that offer programs for physicians and other medical personnel within the larger inpatient population. These groups interact with each other during activities that involve the entire population, such as recreational therapy and 12-step study groups, though group therapy sessions are structured so that the members of the medical professionals population are separated from the general population. The disease of addiction is one of isolation, and treatment in a facility where the other patients are not physicians or healthcare professionals may lead to an increased sense of isolation and despair.[46] As well, such an environment may foster the false belief that the physician is a special case, different from the other patients, and such treatment is detrimental to the individual's recovery. It is important that the physician see peers in the same situation, going through the same treatment.

Most treatment centers are based on the Minnesota treatment model,[47] which is derived from the recovery model of AA. Treatment involves detoxification, monitored abstinence, intensive education, exposure to self-help groups, and psychotherapy. Various models of individual and group therapy all aim at altering key addictive behaviors.[48] Inpatient therapy is an intensive form of treatment, with staff contact extending up to 12 h per day, 7 days per week. In this setting, patients are removed from the stresses of daily life and from access to alcohol and drugs. Typical inpatient durations of stay are between 8 and 12 weeks, but may be as long as 6 to 12 months if it is determined by the treatment team that the patient is not ready for discharge.

Anesthesiologists who are abusing opioids or other anesthetic agents are commonly sent for residential treatment that may last from 2 months to a year or more. The duration of treatment required and the very real possibility that little, if any, of the costs of treatment will be covered by medical insurance can be financially devastating to the physician in early recovery, because most residential treatment centers charge from $3,000 to $4,500 per week for treatment. In one recent survey that examined the level of satisfaction of impaired healthcare professionals with mandatory treatment and monitoring, 40% of Michigan respondents and 53% of Indiana respondents did not have insurance coverage for program costs.[49] The Impaired Professionals Committee should have a basic understanding of what mental health coverage is engendered by their health insurance coverage.

Subsequent Therapeutic Modalities

The intention of the initial period is to lay the groundwork for long-term abstinence and recovery. After successful completion of the inpatient treatment program, the individual is discharged either to a halfway house or directly to the community, where the work of early recovery begins. A structured halfway house community, with 60–120 h per week of staff contact, is often recommended for a 4- to 8-week period. Outpatient therapy may be appropriate under certain conditions. Outpatients must be able to function in their normal daily environment and are expected to remain abstinent despite normal availability of alcohol and drugs. It is our opinion that the chemically impaired anesthesiologist is best initially treated in an inpatient setting.

Most states allow physicians to return to work after inpatient treatment so long as these physicians remain under the supervision of a physician health and well-being organization, such as those sponsored by the state medical society. Monitoring contracts are usually a minimum of 5 yr in duration and include regular contact with a caseworker at the monitoring organization, worksite observation, and random urine drug and alcohol screens. The mainstay of long-term treatment is the complete abstinence from all mood-altering drugs, facilitated group psychotherapy with other recovering physicians, and regular attendance and participation in self-help fellowships such as AA or NA.[49] Concerns specific to reentry to the anesthesia work environment are discussed in detail below.

Abstinence Monitoring

Urine testing is still the cornerstone for monitoring and documenting abstinence in the recovering addict.[50] The value of urine testing as a therapeutic tool has not been clarified, though it is commonly thought to have a deterrent effect on drug use. Details of urine testing and new modalities currently under investigation are described in a subsequent section.

Compliance with mandatory urine monitoring schedules, which must be paid for out of pocket by the individual, may be difficult when financial issues are present. The cost for collection by an approved monitor and processing of urine or blood samples can be as much as $90 per sample and are often collected two or three times per week during early recovery. If the individual has a history of abuse of fentanyl, sufentanil, propofol, or any other drug that is not routinely included in the basic

Table 1. Side Effects Associated with the Use of Naltrexone

Abdominal pain/cramps	Headache
Anxiety	Impotence
Arthralgia	Irritability
Chills	Myalgia
Constipation	Nausea
Depression	Nervousness
Diarrhea	Rash
Dizziness	Sleep disturbances
Ejaculation disturbances	Vomiting

From Silverstein *et al.*[1]; reprinted with permission.

screen for drugs of abuse, the cost per sample to identify these agents is significantly increased.

Receptor Antagonists

Naltrexone, like naloxone, is a relatively pure μ-receptor antagonist. In contrast to naloxone, naltrexone is highly effective orally and still remains part of the treatment for anesthesiologists returning to the operating room. Recent studies suggest that naltrexone may reduce the cravings for both narcotics and alcohol in the recovering addict.[51] It produces sustained competitive antagonism of opioid agonists for as long as 24–48 h and is taken as either 50 mg daily or 100 mg three times per week. The antagonism may be overcome by large doses of opioids, which may result in immediate respiratory arrest. The blocking of agonist activity by an antagonist should be contrasted with the activity of a metabolic inhibitor, such as disulfiram (Antibuse; Wyeth-Ayerst, Philadelphia, PA), which blocks an enzyme in the pathway of alcohol metabolism, leading to the accumulation of a noxious metabolite.[52] Detoxification is mandatory before prescription of naltrexone, because ingestion without detoxification will precipitate a severe withdrawal syndrome. Significant side effects associated with the use of naltrexone are listed in table 1.

Self-help Groups

Participation in self-help groups is considered a vital component in the therapy of the impaired physician.[53] Self-help groups originated as a response to an unmet need for support and services available to those in recovery from addiction.[54] The AA 12-step program is the prototype organization serving as a model for NA and other self-help programs. Meetings of AA and NA are frequent and are available nationwide.

There are also organizations of recovering healthcare professionals based on the "Twelve Steps" and "Twelve Traditions" of AA but with membership limited to those in the healthcare professions. Local groups may be found by contacting the AA or NA or the state Impaired Physicians Program. International Doctors in AA serves as an umbrella organization for physician recovery groups around the world, and Anesthetists in Recovery is a similar group dedicated to recovering certified registered nurse anesthetists.

Professional Behavioral Observation

Once discharged from inpatient treatment, recovering physicians are often required to continue therapy with a certified addiction psychiatrist on a regular basis. Individual therapy may be more frequent initially, and later reduced to one or two office visits a month, designed to uncover behaviors and attitudes that can threaten ongoing recovery.[1]

Additional Psychotherapeutic Modalities

In addition to individual therapy, group therapy is often indicated for a protracted period of time. Designed to educate the individual and modify behavioral factors to support continued recovery,[55] weekly attendance at facilitated group therapy and individual psychotherapy is typically mandated for physicians in early recovery. It should be noted here that if the costs of these mandated sessions is not covered by insurance or if the physician has lost his or her medical coverage as a result of the loss of employment, these costs must be paid out of pocket by the individual in recovery. Inability to comply with mandated therapy and monitoring, even if due only to financial problems, can lead to removal of the physician from the monitoring program and the inability of the individual to reenter the clinical practice of medicine. The worst case would obviously be relapse into active addiction or death from an unintentional overdose.

Attention has been directed to the stresses peculiar to a medical family and to the role played by family members in impairment.[56] Fifteen years ago, this was still a developing subject in substance abuse therapy; involving the family of an impaired physician in the treatment process is now considered critical to the establishment of a support system for recovery.[57] Involving the family of an addicted individual allows for the development of an understanding of the disease concept of addiction, enabling, and has been shown to improve outcomes in the treatment process for addicted individuals.[58]

The Role of Ultrarapid Detoxification

Often the first step in treatment after intervention is detoxification of the individual. Most inpatient facilities admit patients first to a detoxification area, where they can be monitored for signs and symptoms of withdrawal and treated accordingly. This occurs over a period of days and often results in considerable suffering. As well, inpatient rehabilitation cannot begin until the patient is past the withdrawal period and able to focus their attention entirely on the work of recovery. Recently, newer techniques have been developed that dramatically accelerate the detoxification process, often doing so in less than 24 h.[59] Ultrarapid detoxification centers operate on the premise that continued opioid use results from the attempts to avoid withdrawal symptoms, and that elimination of these symptoms can ensure prevention of relapse. The rapid induction onto maintenance treat-

ment with opioid antagonists such as naltrexone is performed during general anesthesia, often in an outpatient setting.[60] Patients are simultaneously relieved of the physical symptoms of withdrawal and placed on opioid antagonist maintenance to prevent cravings and relapse, but little, if any, emphasis is placed on treating either the psychological issues or personal circumstances that resulted in addiction initially. The long-term success of this method has been shown to be no more effective than traditional methods of detoxification when the main outcome measure is the prevention of relapse.[61]

Prognosis

There remain few studies specifically examining the prognosis for continued recovery in the addicted anesthesiologist who returns to the clinical practice of anesthesiology, though the major controversy surrounding this decision surrounds the use of parenteral opioids and their availability in anesthesia practice. The studies available and the current thinking regarding reentry into anesthesiology are discussed in the following section.

Prospects for Reentry into Anesthesiology

Whether anesthesia personnel should be allowed to return to the operating room after successful treatment remains highly controversial. Historically, a distinction was made between the anesthesia resident and the attending. The thought was that the attending has fewer options and should be given a chance to reenter practice, whereas the resident should be encouraged to find another specialty. Too often, however, the attending who has successfully completed a short course of treatment is asked to return to work in the same full-time, stressful practice without any time allowed for early recovery work. The result is often disastrous. Residency programs, however, are more able to adsorb the part-time resident in early recovery, and this slow reentry into clinical practice may allow the motivated individual to pursue a career in anesthesia. The current thought is that the decision to allow an individual to return to the practice of clinical anesthesia should be made on a case-by-case basis, regardless of the level of training.

In the past it was thought that most anesthesiologists who completed therapy should be allowed to return to work. Historical data from the Impaired Physicians Program of the Medical Association of Georgia suggests that physicians who remain compliant with their prescribed program are able to remain abstinent at 2-yr follow-up.[62] However, because individuals lost to follow-up were not included in the evaluation, the majority of case failures were excluded before analysis.[1]

In 1990, a report of 180 cases of substance abuse by residents in anesthesiology concluded that prolonged abstinence was unusual and that redirection to another medical specialty is the desired course for an individual who abuses parenteral opioids.[44] This study queried directors of US anesthesiology training programs regarding the abuse of parenteral opioids and other drugs by their residents. Of the 180 reported cases, 13 (7%) presented as death per anoxic brain injury. Of the 167 remaining cases, 113 (67%) were allowed to reenter anesthesiology training. Those abusing opioids had only a 34% success rate reentering anesthesiology, and of the 66% who relapsed, 13 (25%) died as a result. Those abusing other drugs or alcohol had a 70% success rate, and of the 30% who did relapse, only 1 (13%) died. The authors defined success as an individual who underwent treatment, completed the residency, and had no relapse in practice to the best of the program director's knowledge.

Some have been critical of this study for a number of reasons, though the conclusions are likely valid. The conclusions are based on an incomplete survey of directors whose recall may be inaccurate.[63] As well, only 37% of the residents reviewed received more than 6 weeks of inpatient treatment, a figure considered inadequate by many experts in the field.[64] The authors also have been criticized for suggesting that residents be redirected to other specialties without evaluating the outcome of those who were.

In 2005, another report on the treatment outcomes of anesthesiology residents was published with very similar data. Collins *et al.*[65] conducted a survey of all US anesthesiology residency programs regarding experience and outcomes with chemically dependent residents from 1991 to 2001 and concluded that the redirection of residents who have successfully completed treatment into lower-risk specialties may allow a greater percentage to achieve successful medical careers. The majority of residents studied attempted reentry, but only 46% successfully completed an anesthesia residency. Of those residents who attempted reentry, the mortality rate was 9%.

Obviously, a mortality rate of 9% is unacceptable for any intervention; therefore, we do not advocate automatic reentry into anesthesiology for any residents, attending physicians, or certified registered nurse anesthetists. Rather, we agree with the idea that each case must be evaluated on an individual basis. Recent experience at our institution suggests that a graded reintroduction into the clinical practice of anesthesia may be no better at reducing the incidence of relapse than reintroduction after a short period of treatment.[66] Of note, this process of graded reintroduction may be beneficial insofar as the initial presenting event that marked the relapse of each individual was not death.

Implicit in this discussion of reentry is the potential for denying reentry into anesthesiology. If an addiction psychiatrist recommends that an individual should not return to the practice of anesthesiology, we believe that denial of reentry can be successfully

defended.[1] The case in which the addiction psychiatrist recommends reentry into anesthesia presents problems for denial of reentry. The Americans with Disabilities Act (section IIIE) has placed the onus of responsibility on the employer to prove that the employee is unable to perform the responsibilities of his occupation.[1]

Risk Factors for Relapse

Because of the nature of the disease of addiction, individuals who have successfully undergone treatment are still at risk for relapse. In a retrospective cohort study, Domino *et al.*[67] examined the rate of relapse among 292 physicians involved in the Washington Physicians Health Program between 1991 and 2001. Of the 2,922 individuals studied, 74 (25%) had at least one relapse. Factors that were associated with an increased risk of relapse included a family history of substance use disorder, the use of a major opioid, and the presence of a coexisting psychiatric disorder. Interestingly, the use of a major opioid increased the risk of relapse only in patients with a coexisting psychiatric disorder.

Work Reentry Contract

Anesthesiologists who are allowed to reenter medical practice must agree to certain conditions of reentry. A work reentry contract should be created outlining the individuals' responsibilities. Key to the success of such a contract is the open communication between all involved parties. The treating psychiatrist, members of the recovery support network, and persons responsible for verifying compliance with the work reentry contract need to maintain contact on a regular basis.

Some programs suggest that the first 3-month period of reentry to the operating room should exclude night and weekend calls and the handling of opioids. At the end of this period, the practitioner is reevaluated by treatment personnel. Our policy is to require a period of time, usually at least 1 yr, away from the practice of clinical anesthesia before reentry is attempted. This allows the individual time to concentrate on the work of early recovery and also to consider alternate career paths. The first year back in clinical practice is typically at two-thirds time, or no more than 40 h per week, with no call for the first 3 months.

The ABA has developed a specific policy regarding entry of individuals recovering from alcohol or drug addiction into their examination process. They currently have no written policy regarding diplomats of the ABA who are in recovery.[37]

Prevention

Clearly, the prevention of chemical dependence is preferable to treatment. Unfortunately, this remains a societal problem that is difficult, at best, to deal with.[45] Control of drug supply and education remain the mainstay of prevention, though one study suggests that the increased control and accounting procedures for controlled substances and increased mandatory education has not changed the frequency of controlled substance abuse among anesthesiologists.[11] Random drug screening for all anesthesia personnel remains a contentious issue, and as of 2002, only 8% of anesthesiology residency training programs used random urine testing, though 61% of departmental chairs indicated that they would approve of such a policy.[11] One survey of individuals involved in physician health programs reported a 39% incidence of substance abuse or mental health difficulties before a career in medicine,[68] suggesting that the use of substance abuse screening tools during interviews for medical school or residency may be helpful.

Drug Control

It has been suggested that a major contributing cause of addiction in anesthesiology is easy access to opioids and other psychoactive substances. [69,70] Even if access alone does not result in drug abuse, tighter control allows for earlier detection and documentation in suspected cases of abuse.[1]

A number of methods for control of opioids and other drugs in the operating room exist that involve careful record keeping and evaluation of use patterns.[71–74] Anesthesia information management systems have been successfully used to identify patterns suspicious for diversion among anesthesia personnel.[75] Computerized records may be examined to identify high use of opiates, high wastage of controlled substances, transactions that occur on cancelled cases or after case completion, and automated dispenser transactions that occur in a different location from the scheduled case. There is certainly an innocent explanation as to why any of these transactions suspicious for diversion activity may occur, and follow-up by monitoring personnel is required to determine whether diversion is an issue.

Computerized dispensing units are available for use, though in many institutions a satellite pharmacy dispenses controlled substances. At Mount Sinai, controlled substances are dispensed with a drug disposition form, and subsequently every anesthesia record is checked against the disposition record. Anesthesia personnel are asked to explain any discrepancy, and all discrepancies are reported to the departmental Impaired Professionals Committee. Because a computerized record-keeping system is in use at our institution, monthly reports regarding individual practitioners' use of controlled agents are generated, and outliers are identified. Such reports may be used to facilitate early intervention in cases of suspected diversion.

All waste drugs must be returned to the pharmacy, where they are analyzed on a random basis to verify

content. The Division of Quality Control, Department of Pharmacy of the Mount Sinai Medical Center has established the following policy for evaluating returned waste drugs. All undiluted returned drugs are analyzed by either refractometry or, for alkaloids (morphine, meperidine, fentanyl, cocaine, *etc.*), by precipitation with Mayer reagent. Diluted drugs are not detected by these methods and, in cases of repeated negative qualitative assay for any substance, quantitative analysis is requested from a forensic laboratory. Forensic laboratories are equipped for quantitative analysis of current anesthesia related psychoactive compounds, including fentanyl, sufentanil, and propofol.

Education

There continues to be an effort toward education of the anesthesiology community regarding substance abuse. Presumably, widespread education of the anesthesia community may aid in the early detection of afflicted colleagues. In 1991, between 47% and 89% of anesthesia programs had at least one lecture on substance abuse, but only 33% had an identifiable substance abuse program or committee.[76] By 2001, the number of hours of formal education regarding drug abuse had increased in 47% of programs,[11] but the rate of known substance abuse by anesthesiologists remains constant, at 1.0% among faculty members and 1.6% among resident physicians.[11] Whether education prevents addiction is not clear.

A number of educational videos are available that directly address the issue of substance abuse and anesthesia personnel and may be used as part of a program of education for residents training in anesthesiology. "Wearing Masks: The Potential for Drug Addiction in Anesthesia" was produced in 1993 and sponsored by the Association of Anesthesia Program Directors. The second video in this series, "Wearing Masks II," and the recently released third video, "Wearing Masks III," contain resource material for individuals concerned with addiction.§ The video "Unmasking Addiction: Chemical Dependency in Anesthesiology" was published in 1991 and is available from Janssen (Ortho-McNeil-Janssen Pharmaceuticals, Titusville, NJ).

Testing Methodologies

Urine Testing

When urine is tested as part of a rehabilitation toxicology program, a screening test is usually followed by a more specific confirmatory test because there is a high requirement for sensitivity to avoid a false-negative result. This section discusses current technical and forensic concerns associated with urine drug testing.[77–79]

The general drug screen composition varies from laboratory to laboratory. Certain drugs commonly abused by anesthesia personnel may or may not be included. Morphine, codeine, and meperidine are more commonly included, but fentanyl, sufentanil, alfentanil, and propofol are almost never part of a standard drug screen and must be specifically added to the assay (often at considerable additional expense) of each specimen. It is important to use a general drug screen because of the common abuse of multiple drugs, but specific requests should be noted if fentanyl, sufentanil, or propofol are to be included.

Familiarity with the available laboratory procedures allows for proper test selection and interpretation. Of the commonly available assays, thin-layer chromatography is the least sensitive and is generally performed as a screening test, whereas gas chromatography/magnetic resonance spectroscopy is considered the gold standard against which other methods are compared and by which any positive result should be confirmed.[80]

While some states may require that random drug screening programs guarantee privacy for employees while providing bodily fluids for drug testing, this degree of privacy does not apply to a documented case of substance abuse.

Witnessed collection is necessary to avoid a sham urine sample. Methods to circumvent detection include self-instillation of "clean" urine into the urinary bladder, either through catheterization or suprapubic injection, and the use of an artificial penis with a reservoir for clean urine, worn close to the skin and kept warm. Artificial urine is commercially available from multiple vendors *via* the Internet, and a number of teas, herbs, and extracts are marketed with the intent of allowing the user to "conquer" the urine drug tests.

Random observed urine collection is mandatory, because an addict will simply avoid drug use if a urine test is announced in advance or if a routine collection time becomes apparent.

Drug abuse detection requires knowledge of the suspected drug's biologic half-life, extent of biotransformation, and major route of excretion.[81] The primary clearance of fentanyl is metabolic. McCain and Hug[82] estimated that renal clearance of fentanyl in volunteers was only 6%. Based on this work, a regular user should have detectable fentanyl in urine for 3–5 days. Nanogram quantities of fentanyl can be detected in the urine, though there are a number of reports from "recovering" addicts who report regular fentanyl abuse not detected on routine urine tests.[1] Norfentanyl, a fentanyl metabolite, can be detected in the urine up to 96 h after small (100-μg) doses of fentanyl and should probably be the analysis of choice.[1] The metabolism of sufentanil is similar to that of fentanyl, and it is possible to detect the metabolite for a period of time that is longer than the interval for detection of the parent compound.

§ These videos are available free of charge from the publisher and may be ordered at: http://www.allanesthesia.com. Accessed June 22, 2008.

Morphine-3-glucuronide is the primary inactive metabolite of morphine. Detectable in the plasma 1 min after intravenous administration of morphine sulfate, it is detectable in urine for up to 72 h.[83] Meperidine is primarily metabolized to normeperidine, a compound that can be detected in the urine for as long as 3 days after administration.[83]

Hair Analysis

The half-lives of most of the agents typically abused by anesthesiologists are short, and the circulating concentrations are often too weak for detection at the time of urine or blood sample collection. An alternative method developed to detect chronic exposure to these drugs of abuse is the analysis of hair samples obtained from the individual under the same chain-of-custody guidelines as for urine or blood samples. Depending on the length of the hair, it is possible to test exposure over a period of time measured in months rather than hours or days.[70] Hair can serve as a marker of chronic exposure because drugs of abuse or their metabolites are incorporated into the structure of the hair follicle over time as the hair grows. The actual mechanisms of substance incorporation are unclear, but it is believed that drugs or chemicals either passively diffuse from blood capillaries into growing hair cells or are deposited onto the completed hair shaft from sweat or sebum secretions.[84]

The chromatographic–mass spectrometric techniques used today have increased test sensitivity and improved detection limits such that picogram to microgram levels of agent or metabolite can be detected.[85] Despite the ability to detect minute quantities of substances in the hair of individuals suspected of illicit drug use, certain limitations do exist. The most obvious is that the individual to be tested needs to have hair on which to perform the desired assay. It is not infrequent for an individual to arrive at the testing location having either trimmed or shaved their hair entirely. While such actions are telling in and of themselves, hair for forensic analysis may be obtained from alternative areas, such as the underarms, pubic area, chest, or thigh, if hair from the scalp is not available.[85]

When a positive result is obtained, often there is objection, and the question of contamination arises. Experiments have shown that positive test results can be obtained when hair has been environmentally exposed to particular agents, either by proximity to drug use or by intentional contamination. Hair experimentally contaminated with both the solid hydrochloride form and the evaporated base of cocaine has tested positive for use in subjects who have not ingested the drug.[86,87] Because of the implications of such a positive result, hair samples should not be taken in a physical site where the chemical to be tested for is present. Moreover, the individual taking the sample should thoroughly cleanse their hands before and wear gloves when obtaining the sample.

Naltrexone Assays

Naltrexone assays exist as a measure of patient compliance with mandated ingestion. Difficulties reside in the stability of the specimen. One laboratory will only accept serum or plasma that is wrapped in foil and shipped frozen. Because of sample instability, a negative test result may not indicate noncompliance with prescribed naltrexone ingestion. The only reliable measure of compliance with naltrexone therapy is witnessed ingestion.

Reliability of Assays

The requirements for urine drug testing of anesthesia personnel include accurate forensic testing for fentanyl and its derivatives, as well as other commonly abused drugs. A major concern, given the high stakes involved with the monitoring of a physician addict, remains the accuracy of the testing laboratories.[88,89] Performance testing, in the form of known blind samples, should be submitted to the designated laboratory on a regular basis (*e.g.*, 3 per 100 specimens) from high-volume testing centers. Knowledge of the laboratory's error rate (either false positive or false negative) on these blind controls is essential in evaluating analytic results.[1]

Misleading Positive Results

The report of significant concentrations of codeine and morphine in urine at 6 and 22 h after the consumption of three poppy seed bagels by Struempler[90] in 1987 highlighted the necessity for further evaluation of a positive test result. This is not a false positive, because the actual substance being assayed was present and detected. It represents a positive result with a cause unrelated to substance abuse. When a positive test result is attributable to the ingestion of poppy seeds, specific ratios of codeine to morphine can be identified.[91] Still, recovering addicts are advised to avoid the consumption of poppy seeds. In addition to dietary causes, nonprescription medications may also result in misleading positive results.[92] Because of this, many Impaired Physicians Programs specifically require that participants familiarize themselves with and abstain from any foods or nonprescription medicines that, when ingested, might lead to a positive test result for drugs of abuse.

Cost

The cost of initial drug screens is usually borne by the hospital or department, but the recovering addict is often required to bear the cost of ongoing monitoring. One laboratory in New York State currently charges $32.50 for a screening urine test with a fentanyl assay, but the price jumps to $290 per sample if a propofol assay is requested. Hair analysis can cost well over a

thousand dollars per sample. This is a significant expense for individuals requiring six to eight screens per month as part of a monitoring program, especially for those who do not have insurance to help defray the costs of treatment. Responsibility for the expense of testing should be clear and agreed to in advance. Often, arrangements for bulk discounts can be made by medical societies or hospitals.

Conclusions

Addiction is still considered by many to be an occupational hazard for those involved in the practice of anesthesiology. It has been suggested in this review that the presence of readily available highly addictive agents in our work environment contributes to the potential for abuse in a subset of the population at risk. Because it is not possible to identify these people before they become addicted, it is essential that each of us learn to recognize the signs and symptoms of addiction when they become manifest, such that we may preserve the safety of both our colleagues and the patients they care for. Although some highly motivated individuals have been able to successfully reenter the clinical practice of anesthesia and avoid relapse, this is not always the case. Successful completion of a treatment program does not guarantee freedom from future relapse, even several years into recovery. As such, each case must be carefully evaluated before the decision is made to allow an addicted physician to attempt a return to the practice of anesthesiology.

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Anesthesiology 2008; 109:762–4

The Anesthesiology Community's Approach to Opioid- and Anesthetic-abusing Personnel

Time to Change Course

IN this issue of ANESTHESIOLOGY, Bryson and Silverstein[1] provide an excellent detailed summary of addiction and substance abuse among anesthesiologists, and a review of "state-of-the-art" theories on the mechanisms of addiction, as well as recognition, intervention, treatment, and aftercare of addicted caregivers. Their thoughtful review once again reminds us that anesthesiology, as a specialty, has made a sincere and earnest effort to diminish substance abuse and addiction within its ranks through education and the creation of ever more intrusive and cumbersome drug-dispensing and -control mechanisms. While new information is continually emerging on these issues, it is apparent from the authors' analysis that despite multiple programatic efforts, there has been little, if any, positive impact on the specialty-wide incidence of substance abuse and addiction. Deaths from opioid abuse continue, and additional reports of deaths from nonopioid anesthesia-related drugs (such as propofol or inhalational anesthetic abuse)[2,3] periodically appear.

Although the drugs most commonly abused by the general population are nicotine and alcohol, multiple studies have shown that the drugs of abuse for which most anesthesia providers enter chemical dependency treatment are the potent opioids, with alcohol following far behind.[4] The rate of abuse of other anesthesia-related drugs is largely unknown. Anesthesiologists clearly present a skewed subset of the general population, and there is no question that they get in trouble with very dangerous and often rapidly lethal drugs. Further, anesthesiologists abuse these highly potent drugs more than other physicians.[5]

In the United States, considerable efforts have been made to reduce the incidence of drug diversion by anesthesia practitioners through the implementation of systems such as those mentioned in the Bryson and Silverstein discussion. However, at Mayo Clinic, Rochester, Minnesota, the Department of Anesthesiology has carried these systems a step further. While Bryson and Silverstein use a *qualitative* random assay of returned waste in their own practice, Mayo Clinic uses a more expensive *quantitative* assay of randomly selected returned narcotic samples in conjunction with the other methods the authors describe (*e.g.*, computer charting and Pyxis machine [Cardinal Health, Dublin, OR] drug-dispensing records). Division of Pharmacy personnel rigorously review all available data and, in concert with a representative of the Department of Anesthesiology Chemical Abuse Committee, relentlessly investigate any apparent discrepancies in charting or variations from typical practice patterns. For such a system to be effective, there must be excellent cooperation between the Division of Pharmacy and Department of Anesthesiology to support the auditors in order to avoid "us-against-them" conflicts. In every instance of suspected narcotic diversion, all waste narcotic returned by the individual in question is assayed until diversion is either confirmed or disproved. With this system in place, Mayo Clinic has seen its rate of recognized diversion of narcotics—in a department that has a combined population of some 475 staff anesthesiologists, residents and fellows, nurse anesthetists, and nurse anesthesia students—decrease from approximately one incident per year for many years to one incident in the past 7 yr. Having said that, we understand that there will continue to be practitioners who divert anesthesia-related drugs for their personal use, and we suspect that at Mayo Clinic Rochester, the problem is simply in remission, not cured. We are hesitant to suggest that this system change is solely responsible for the apparent decrease in diversion, although we are cautiously optimistic that the trend will continue.

One issue not addressed by Bryson and Silverstein is that other anesthesia care providers (*e.g.*, nurse anesthetists, sedation nurses) are at similar, if not increased, risk of addiction simply because their practices are often in remote settings, and they may not fully appreciate the risks of a first-time experiment with diverted anesthetic drugs. Unfortunately, there is very limited comment in the literature on this topic. However, one of us (K.H.B.) frequently lectures to large nurse anesthesia groups on this problem, and in response to the question, "Who here has lost a friend or colleague to narcotic addiction?" nearly every hand in the audience will go up. The American Association of Nurse Anesthetists has an active support line in an effort to help with the recognition and appropriate handling of drug diversion, and the death of a former American Association of Nurse Anesthetists president to a fentanyl overdose in 2002 makes the point vividly clear that abuse of diverted anesthetic drugs does not choose its victims by the letters after their names.

This Editorial View accompanies the following article: Bryson EO, Silverstein JH: Addiction and substance abuse in anesthesiology. ANESTHESIOLOGY 2008; 109:905–17.

Accepted for publication August 5, 2008. Dr. Seppala is employed by Beyond Addictions, Beaverton, Oregon, and, as a part of his duties, cares for addicted patients. Otherwise, the authors are not supported by, nor maintain any financial interest in, any commercial activity that may be associated with the topic of this article.

What is the risk to the patient posed by a narcotic-addicted caregiver? Here the literature is relatively silent. Certainly none of us having a surgical procedure would desire our anesthesia caregiver to have just self-administered a narcotic, especially if it were prescribed and intended for us. Bryson and Silverstein state that one method of diverting is to substitute β-adrenergic blocking drugs for narcotics. Who among us would care to awaken from an anesthetic with a nice slow heart rate but inadequate analgesia?

The thorniest question posed to those who must deal with identified drug abusers or narcotic-dependent individuals is what to do with them once they emerge from their treatment program. For the past many years, there seems to have been a national consensus that narcotic-dependent anesthesia personnel in recovery should be allowed to return to the practice of operating room anesthesia in a closely monitored setting. This also has been the policy of the Mayo Clinic Department of Anesthesiology, and generally this is the recommendation of the addiction medicine and psychiatric caregivers when they release the addicted anesthesia personnel back to the administrative responsibility of their employers. Certainly the passage of the Americans with Disabilities Act further created the impression that return to practice with reasonable accommodation is the only choice in this setting; at least this was the impression immediately after enactment of the Act (Jill Beed, J.D., Legal Counsel, Mayo Clinic, Rochester, Minnesota, personal verbal communication, July 23, 2008). Although, as noted by Bryson and Silverstein, case law and legislative acts over the years have refined the implications of the Americans with Disabilities Act regarding substance use disorders, considerable ambiguity still exists in this area.

We recommend another approach: We believe that, specifically in the case of an individual who has become addicted to or is abusing self-administered anesthetic drugs and supplements (*e.g.*, opioids, benzodiazepines, inhalational anesthetics), it is high time for our specialty to undergo a fundamental reconsideration of our policies. We believe that a default "one strike, you're out" policy should replace the current default position of assuming a return to the workplace. We propose this for several reasons. First, neurobiologic research has revealed that addiction is a disorder of the brain's reward system, which alters behavioral drives that are under limited conscious control. Decision making is damaged by addiction so that abstinence is not simply a choice. Indeed, Gastfriend dubs addictive disease as "a brain disease that subverts self-preservation."[6] Returning to the operating room (or other anesthesia practice settings) places the anesthetic abuser or opioid addict at high risk for relapse. Second, a pragmatic review of our personal experience with our Mayo Clinic nurse anesthetists who have become addicted to narcotics, successfully completed treatment, and returned to the workplace (approximately 12 over the past 20 yr) leads us to believe that there has been a nearly 100% relapse rate (K.H.B. and Mary E. Marienau, C.R.N.A., Coordinator of Mayo School of Nurse Anesthesia, Rochester, Minnesota, personal verbal communication, October 2007). It is difficult to exactly quantify the relapse rate, because far too often affected individuals are simply lost to formal follow-up, and word filters back through acquaintances of multiple relapses, job changes, and in some cases deaths. In the case of other categories of addicted anesthesia caregivers at our institution (*e.g.*, residents and student registered nurse anesthetists who went on to complete their training), although we are aware of some relapses, too many have been lost to follow-up to draw any conclusions. Third, the study by Menk *et al.*[4] in 1990 showed that nearly two thirds of parenteral opiate–addicted anesthesiology residents who return to their training program relapse, and in 16% of these cases death was the initial clinical presentation of relapse. Abusers of diverted inhaled potent anesthetics seem to fare no better.[3] With two recent studies of narcotic addiction among anesthesia residents showing the death rate with relapse ranging from 9% to 31%,[7,8] we question the wisdom of the current approach to allow known addicts to return to the workplace and the daily temptation of access to addictive drugs. Bitter experience over the years suggests that returning those addicted to or abusing anesthesia-related drugs to the operating room work environment puts bright, talented young people at an unnecessary risk of premature death.

We suggest that anesthesia caregivers who have become addicted to or abuse anesthetic drugs and supplements should be directed toward lower-risk occupational environments, either within medicine or in a different field entirely. We fully understand that we will be criticized for advocating what many will see as a draconian stance, but we believe it is high time that this issue is thrashed out in public debate. Some will say, "Show us the data to support the contention that addicts redirected to other professional domains with less access to narcotics and anesthetics will have a lower relapse and death rate." Such data do not exist, and most likely never will exist. Here, an element of pragmatism might stand us in good stead, similar to that exhibited in the *BMJ* article in 2003 which rather famously challenged the contemporary blind allegiance to randomized controlled trials by proposing (tongue-in-cheek) that such a study be conducted to assess the efficacy of parachutes in preventing injury after individuals jump out of airplanes.[9] Sometimes we do not need time-consuming prospective studies (which, during their completion, place even more individuals at risk) to do the right thing; sometimes the issue speaks for itself: *res ipsa loquitur*.

It is time we as a specialty stop—or at least revisit—this practice of returning narcotic- or anesthetic-abusing or addicted anesthesia caregivers to the operating room environment. Removing the proven at-risk healthcare

providers from the high-risk operating room environment should not be based on concerns for political correctness, but instead on concerns that a return to practice carries with it a significant likelihood of death or permanent disability of professionals during the most productive years of their lives.

Keith H. Berge, M.D.,* Marvin D. Seppala, M.D.,† William L. Lanier, M.D.‡ *Department of Anesthesiology, Mayo Clinic, Rochester, Minnesota. berge.keith@mayo.edu. †Beyond Addictions, Beaverton, Oregon. ‡Department of Anesthesiology, Mayo Clinic, Rochester, Minnesota.

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Vigilance and the Drug-dependent Anesthesiologist

To the Editor:—The recent editorial by Berge and colleagues[1] sends an extremely important message to the anesthesia community, and I agree with many of its thoughtful and incisive points. However, I must take issue with the authors' proposed new default position of "one strike, you're out." I believe that the question of return to work is far too complex to be approached in a monolithic fashion that lumps all anesthesiologists who have manifested drug dependence into a single group that "should be directed toward lower-risk occupational environments, either within medicine or in a different field entirely."

A uniform prognosis cannot be assigned to every drug-dependent anesthesiologist. For example, Domino *et al.*[2] suggest that dual diagnosis and family history are among the major factors that must be taken into account when predicting the risk of relapse in opioid-addicted physicians. My own experience supports an additional and extremely important variable that must be considered when deciding whether or not a drug-dependent anesthesiologist should return to his or her profession: The availability of long-term supervision, support, and monitoring. The Medical Society of the District of Columbia's Physician Health Committee (PHC) intervenes on physicians whose colleagues (and sometimes themselves) believe them to be suffering from the disease of drug dependence. The PHC refers this physician to a specialist in addiction medicine and, if recommended, facilitates admission to treatment (usually residential). Immediately after discharge the physician, now in early recovery, enters into a five-year contract with the PHC. This contract mandates random drug testing (a daily phone call determines whether or not an observed urine sample must be furnished within the next 12 h), monitoring by a member of the PHC, participation in 12-step programs, and continuing aftercare under the supervision of an addictionologist. Some of our clients also submit hair samples for drug testing every two to three months. Our recommendation for a graduated return to work is made only after we receive a recommendation from the treating specialist that this would be appropriate. Aftercare of opioid-addicted anesthesiologists in recovery may include the use of depot naltrexone. At least one supervisory member of the department is made aware of the individual's history at the time of return and is informed that the PHC will be responsible for monitoring.

Approximately 90% of physicians (including anesthesiologists) enrolled in the Washington, DC Medical Society's Physician Health Program have successfully completed their 5-yr contracts.[3] The PHC has monitored sufficient numbers of anesthesiologists in recovery whose return to work has been recommended to support my stance that "one strike" need not preclude reentry into anesthesiology. At the present time, although some of our clients do indeed voluntarily leave anesthesiology for another medical specialty, those who have returned to the practice of anesthesiology have been successful in their recovery. While the group of anesthesiologists with whom we have experience is small in comparison with the entire national cohort, our observations support my view that individual consideration, long-term close surveillance, and aftercare by specialists in addiction medicine may provide an alternative to the editorial's default position.

In contrast, the editorial[1] appears to base at least some of its argument on a "pragmatic review of our personal experience with our Mayo Clinic nurse anesthetists," leading to the observation that "there has been nearly a 100% relapse rate" (relapse is not defined and could represent anything from a single "slip" to a full-fledged resumption of frequent drug use). It is significant that the authors do not provide evidence of long-term monitoring of these nurse anesthetists. Indeed, they state that "it is difficult to exactly quantify the relapse rate, because far too often affected individuals are simply lost to formal follow-up."

Finally, the editorial refers to Gastfriend's statement that addiction is "a brain disease that subverts self-preservation"[4] to support its contention that "decision-making is damaged by addiction so that abstinence is not simply a choice." However, Gastfriend also clearly emphasizes—quoting reports from several other Physician Health Programs—that "the vast majority of physicians who have substance use disorders seem to do surprisingly well in recovery." While I certainly do not disregard the unmistakable threat that addiction poses to anesthesiologists and patients, my own personal experience, and that of other PHC chairs, suggests that the editorial's pessimism is not justified. Documented sobriety *is* possible within the operating room environment. When complemented with vigilance,* including supportive and careful long-term monitoring, return to work can be successful for both the physician and society.

Peter J. Cohen, M.D., J.D., Physician Health Committee of the Medical Society of the District of Columbia and Georgetown University Law Center, Washington, DC. ccohenp@aol.com

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* See logo of the American Society of Anesthesiologists at http://www.asahq.org/Newsletters/2000/09_00/fig1.gif. Accessed April 10, 2009.

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Anesthesiologists Returning to Work after Substance Abuse Treatment

To the Editor:—We read with interest the review article *Addiction and Substance Abuse in Anesthesiology* by Bryson and Silverstein[1] and the companion editorial by Berge *et al.*[2] While the former is an excellent overview, the authors inaccurately state that "outcomes have not appreciably changed" for anesthesiologists treated for substance abuse and the emergent role of state Physician Health Programs (PHPs), and their documented achievements in this regard are not adequately emphasized. The subsequent editorial then mentions patient harm, ignoring literature to the contrary, and jumps to the unwarranted policy recommendation of "one strike, you're out."

* See Web site of the Federation of State Medical Boards at http://www.fsmb.org/pdf/1995_grpol_Physician_Impairment.pdf. Accessed April 8, 2009.

Three articles strikingly absent in the review and our own recent work document excellent outcomes for all physicians, including anesthesiologists, treated and monitored by PHPs. To summarize each, Pelton and Ikeda[3] reported a 10-yr follow-up of 255 physicians (including 35 anesthesiologists) successfully completing the California Diversion Program with excellent outcomes. They concluded that anesthesiologists had "equal chance of recovery and contradicts the pessimism about recovery in anesthesiologists." Paris and Canavan[4] reported a case control study comparing relapse and recovery rates between addicted anesthesiologists and other physicians. Thirty-two anesthesiologists were compared with 36 randomized physician controls. After an average of 7.5 yr, the relapse rates between groups were not significantly different. They concluded, "with aggressive follow-up and monitoring, clinicians can expect similar relapse and recovery rates for anesthesiologists as others." The authors cite Domino *et al.,*[5] but they didn't mention that the study reported excellent outcomes over an 11-yr follow-up among 262 physicians, of whom 33 were anesthesiologists, and there was no statistical difference in relapse rates for anesthesiologists as compared with other physicians. In addition, there was not a single anesthesiologist overdose death. Finally, McLellan *et al.,*[6] recently published by our group, looked at outcomes of 904 physicians from 16 PHPs followed for 5 or more years. Of this group, 102 were anesthesiologists who we found received more intensive monitoring and had slightly better outcomes with no deaths. Overall, outcomes were remarkably positive for all physicians.

Furthermore, the brief mention of "Impaired Physician Programs" in this review fails to adequately describe modern PHPs that have taken the lead nationally, represented by the Federation of State Physician Health Programs, and are now supported and acknowledged by the Federation of State Medical Boards as preeminent clinical mediators of early detection, treatment, and long-term monitoring of troubled physicians.* These programs use innovative technologies for monitoring (for example, regularly testing hair or fingernails for fentanyl and internet-based notification and monitoring) and treatment (such as depo-naltrexone), to mention a few, that identify relapse early and likely account for improved outcomes.

Berge *et al.*, in their subsequent editorial, highlighted concerns about patient safety without mentioning data to the contrary. For example, Domino *et al.* found no evidence of patient harm during their 11 yr follow-up. Sivaragan *et al.*[7] examined data from the American Society of Anesthesiology malpractice database, seeking evidence of patient harm from substance abuse. Of the 2,715 closed anesthesia claims, in only 7 was substance abuse noted in the claim summary. Two of the 7 cases involved substance-abusing nurse anesthetists inadequately supervised by anesthesiologists. Three of the remaining 5 claims involved serious patient harm (brain damage or death) as a result of lack of vigilance or judgment during anesthesia. Two involved anesthesiologists who were alcoholics, and the third involved an anesthesiologist who left the care of the patient to smoke a cigarette. The two alcoholic anesthesiologists had been unavailable to provide care, one because of alcohol intoxication and the other who left to attend rehabilitation without providing backup care for a chronic pain patient. In summary, of 2,715 malpractice claims against anesthesiologists 5 involved substance abusing anesthesiologists, 4 of whom were alcoholics and the other a smoker. None involved drug-addicted anesthesiologists. The special stigma directed toward opiate-addicted anesthesiologists does not appear to be warranted.

The recommendation, therefore, by Berge *et al.* to change the default policy to "one strike, you're out" is misguided. Before discarding anesthesiologists that fall prey to the scourge of substance abuse, let us first establish early detection programs, such as workplace drug testing, that have only just begun to be used[8] to identify problems early, before overt impairment or overdose; and second, immediately refer those affected to PHPs so they can be properly managed and monitored to assure good outcomes.

Gregory E. Skipper, M.D.,* Robert L. DuPont, M.D. *Alabama Physician Health Program, Montgomery, Alabama. gregskipper@usa.net

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Reentry after Addiction Treatment: Research or Retrain?

To the Editor:—Addiction remains a disconcerting disease for anesthesiologists, and we applaud Bryson and Silverstein[1] for their comprehensive review. In the editorial accompanying the review, Berge *et al.*[2] have taken an extreme position by recommending that "anesthesia caregivers who have become addicted to or abuse anesthetic drugs and supplements should be directed toward lower-risk occupational environments, either within medicine or in a different field entirely." Although this suggestion may be appropriate for some addicted anesthesia caregivers after undergoing initial treatment, we also know that there have been many individuals who have successfully reentered the specialty of anesthesiology to become productive clinicians and academic leaders. The critical question is whether we can differentiate the treated addict who will relapse from the one who can, under the right circumstances, be integrated back into the practice of anesthesiology without adverse consequences. Is there data to support Berge *et al.*'s recommendation?

The cry for redirecting recovering anesthesia personnel to other specialties began with the Menk *et al.*[3] 1990 publication describing the experience of anesthesia training program directors. Data were collected on 180 residents abusing opioids or other addicting drugs. The relapse rate was 66% for the 79 opioid-dependent residents who returned to anesthesiology. It was especially disturbing that there were 14 deaths among this group. Since the relapse rate was much lower (30%) in returning residents who had abused alcohol or nonopioids, the authors recommended redirection into another medical specialty for residents who had been addicted to parenteral opioids. Collins presented similarly dark data, noting that of the 50% of anesthesia residents who continued in anesthesiology after treatment, 9% died.[4]

On the other hand, research that emanates from state Physician Health Programs paints a different picture. In a retrospective case control study, Paris and Canavan compared 32 anesthesiologists with 36 physician controls, and after an average follow-up of 7.5 yr, there was no difference in the relapse rates between these 2 groups.[5] Likewise, the outcomes of residents did not differ from attending physicians. A similar report from Pelton[6] involving 255 physicians who had participated in the California Diversion Program showed no difference in relapse rates for anesthesiologists.

It is of concern that none of the published studies describing the outcomes of addicted anesthesiologists contain specifics regarding the treatment, the follow-up care, or the factors that were used to determine whether to recommend return to anesthesia or redirection. Addiction treatment in physicians today is rich and sophisticated, with careful attention to the components of the addiction itself, peer-based support, family therapy, and continuing care protocols through Physician Health Programs in most states. Anesthesiologists or those in training who return to the specialty must now agree to specific terms of follow-up care, often including the mandatory use of naltrexone. From Domino's work, we know that the risk of relapse in physicians is highly associated with the use of opioids, coexisting psychiatric disease, and a family history of addiction.[7] Angres *et al.* have published lists of factors that they used to decide whether addicted anesthesiologists were candidates to return to the specialty immediately after treatment, should be reassessed after 2 yr, or were at high risk for relapse and not recommended for return.[8]

Nonetheless, the science of addiction treatment remains in its infancy. An exhaustive evaluation of the addiction, psychological, psychiatric, and occupational characteristics of anesthesia providers in treatment has not been performed to date. Research that triangulates the patient characteristics, the type of treatment, and patient outcome is critical but nonexistent. Addiction is a complex disorder with varying severity, course treatment sensitivity, and outcome. Berge *et al.*[2] by suggesting that we apply a "retrain everyone" policy, ignore this complexity.

One of the authors (PHE) directs a program that in the past 9 yr has evaluated or treated 128 addicted anesthesiologists, as well as hundreds of anesthetists. Many of them do return to anesthesia with a carefully staged reentry process. Additional assessment and management protocols have been put into place to decrease the likelihood and lethality of relapse. Most anesthesia personnel are carefully monitored, reengage slowly, and are at least partially protected by naltrexone, preferably administered intramuscularly. It is our belief that we need research, not a one-size-fits-all policy for our colleagues suffering from the disease of addiction.

Paul H. Earley, M.D., Arnold J. Berry, M.D., M.P.H.* Emory University School of Medicine, Atlanta, Georgia. aberry@emory.edu

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Throw out the Bathwater; Keep the Baby

To the Editor:—The article by Bryson and Silverstein[1] and the accompanying editorial by Berge, Seppala, and Lanier[2] together provide a comprehensive review of much of the current literature regarding the diseases of substance abuse and addiction and their devastating impact on too many anesthesia care providers.

I completely agree with the opinion expressed by Berge *et al.* that professional organizations must continuously reexamine their efforts to protect their patients and colleagues from the consequences of these diseases.[2] However, their editorial does not provide sufficient justification for their "one strike, you're out" policy towards substance abusing anesthesia care providers. They offer only anecdotal reports and fail to present any unique, peer-reviewed data or novel insights to support such a dramatic shift in policy. Their approach overlooks several important aspects of these diseases as they pertain to anesthesia care providers: 1) There are important differences between addiction to "anesthetic drugs" and "supplements," and it is inaccurate to lump them together; 2) the circumstances under which a trainee becomes chemically dependent frequently differs from that of a seasoned practitioner, with profound implications for prognosis; 3) denying reemployment treats only a symptom and may do little to impede unresolved drug-seeking behavior (this was tragically illustrated in a recent newspaper article detailing the drug- related death of an anesthesiologist);* and 4) as acknowledged in the editorial, the fact remains that data are lacking to prove that relapse and death rates would be affected by redirecting recovering anesthesiologists to other specialties.

Instead of the "one size fits all" approach advocated by Berge *et al.*,[2] I prefer the recommendation of Bryson and Silverstein[1] of an individualized diagnosis and treatment plan, such as is currently employed by many chemical dependency treatment centers.[3] These programs provide distinct categories that define a patient's risk factors and potential to return, under strict supervision, to various work environments, including the operating room. For example, those who fall into the most favorable category understand their disease, have no underlying psychiatric disorder, are committed to recovery, and have support from their families and colleagues. On the other hand, those in the least favorable category have coexisting psychiatric disease, continue to deny their addiction, and demonstrate no genuine interest in the recovery process. Individuals in the former group are excellent candidates for supervised reentry into practice, those in that latter should be directed to a different profession.

A reasoned approach such as this, coupled with strict supervision and aggressive efforts using modern technology to deter and detect drug diversion, should help us to avoid throwing out all of the babies with the bathwater.

* http://www.boston.com/news/local/massachusetts/articles/2008/11/09/something_anything_to_stop_the_pain/?page=full. Accessed January 25, 2009.

Jonathan D. Katz, M.D., Yale University School of Medicine, New Haven, Connecticut. Jonathan.Katz@Yale.edu

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Anesthesiology 2009; 110:1425

The Quality of Care by Opioid- and Anesthetic-abusing Personnel

To the Editor:—One issue incompletely addressed by Bryson and Silverstein[1] and by the accompanying editorial of Berge *et al.*[2] is the problem of the quality of care delivered by the anesthesia care provider who is relapsing into opioid addiction.

The time between relapsing addiction and diagnosis typically extends into many months, as in a recent case presented on the first page of a *Sunday Boston Globe* article.[3]

In this rather long time period the anesthesia care provider will be treating a few hundred patients while either under the influence of self-administered opioids or during a withdrawal syndrome. It is doubtful that his or her care would be in accordance with the principles of the American Society of Anesthesiologists. For one, vigilance would be obviously and seriously impaired either by the psychic effects of self-administered opioids or by signs and symptoms of a withdrawal syndrome. Given the suggested rate of relapse in opioid addiction from the pragmatic review of the Mayo Clinic experience (*"[. . .] there has been a nearly 100% relapse [. . .]*)[2] and the high rate of individuals lost to formal follow-up in other studies, it is likely that many thousands of patients have been treated by anesthesia care providers in the course of their relapsing addiction to opioids.

I am therefore totally in accord with the proposal of Berge *et al.* to direct anesthesia caregivers who have become addicted to or abuse anesthetic drugs and supplements away from the practice of clinical anesthesia, once and for all and at the first diagnosis. As we struggle to improve our care and to diminish the tragic effects of medical errors, we cannot allow hundreds of future patients to predictably suffer and possibly die because of laxity and misplaced kindness in our approach to opioid addiction in anesthesia providers.

Andrea Torri, M.D., Massachusetts General Hospital, Boston, Massachusetts. atorri@partners.org

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Anesthesiology 2009; 110:1425–6

One Strike, You're Out: One Size Fits None

To the Editor:—I read with interest the article by Bryson and Silverstein[1] and the accompanying editorial by Berge, Seppala, and Lanier.[2] The problem of addiction among all anesthesia providers is a problem that requires continued study and attention to try and lessen the potentially devastating impact this disease continues to have among our colleagues.

While I welcomed the exposure to this issue the article brought, I am disturbed by the editorial by Berge *et al.* and the attention it may receive as representing current opinion regarding their recommended approach to this problem.

Coming from a background of 29 yr of private practice as an anesthesiologist and 14 yr of active recovery, I have worked with physician health programs in 2 states as well as remaining involved with well-being activities in my local hospital, my state medical association, and our state component society of the American Society of Anesthesiologists. I have been aware of and witnessed both the successes and tragedies of the disease in anesthesiology with my involvement in recovery in these capacities.

I do not agree with the proposed approach of Berge *et al.* of "one strike, you're out." I think that this is exactly opposite to the approach that should be taken to individuals who find themselves addicted to or are abusing drugs used in the work environment. I also disagree that the current default position is one of assuming a return to the workplace, a policy that I equally take issue with.

I am in agreement that there are data lacking to fully support any specific position on this issue, and also agree with Berge *et al.* that such data would be impossible or inappropriate to obtain using the usual scientific approach. Further, the idea that a pragmatic approach should therefore be taken is also difficult to argue with. Where these concepts diverge from what I feel needs to be done is in how to apply this to the individual physician caught up in the disease process.

Anyone who has been active in physician well-being and addiction recovery has seen that there is a great deal of ignorance about this issue by even otherwise well-educated and well-intentioned people, often in the position to either support the idea of an appropriately conducted recovery of an individual or not. My concern with "one strike, you're out" is that you will give these individuals the easy option of dismissing *every* addicted anesthesia health care worker as too dangerous to return to work. That is draconian and also inappropriate. Evaluating each case individually involves a lot of work. Creating an appropriate aftercare environment of support, accountability and monitoring does also, but we as physicians need to do this for our colleagues.

Further, I believe that "one strike, you're out" will discourage individuals who might otherwise seek help from doing so because of the

concern that this action will end their career. Rather than disclose the need for help, even after years of successful practice, the individual will choose to remain out there rather than suffer the inevitable consequence of career loss. This has a strong potential for keeping the individual isolated, disease progressing, until he injures a patient or himself and then is discovered. For some individuals career redirection needs to happen and is the right approach, but it shouldn't be applied to everyone any more than the idea that everyone should get a chance to return to the same work environment in the same capacity.

I am also disappointed in the editorial policy of ANESTHESIOLOGY that allowed this editorial to be published without so much as a counterpoint view. For the uneducated and inexperienced in this area this editorial may well be adopted as the standard approach by some departments and treatment centers dealing with these personnel, simply because it appeared as it did in this journal. That would be very unfortunate and a tragedy for some in its own right.

I think this editorial, unlike the article by Bryson and Silverstein,[1] have helped foster the idea that we need a "one size fits all" approach where what we should be doing is to evaluate each case individually, applying data where they it exist (like family history, personal history, length of time using, comorbidities, family and hospital/department support, and environment, among others) and individually making a decision to return to the same work or not, employing appropriate monitoring, aftercare and safeguards for the individual and to protect his or her patients.

I agree that it is time we revisit the issue of addiction among our anesthesia caregiver peers. We should continually revisit the handling of this problem, given the potentially tragic consequences to our peers and their patients. I would propose continuing to develop an individualized care plan, based on the best data and judgment available, for each of them much as we do for all our other patients.

Thomas C. Specht, M.D., Tahoe Forest Hospital, Truckee, California. tcspecht@usamedia.tv

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In Reply:—We thank the authors of the six letters to the editor, as well as the many other concerned readers of ANESTHESIOLOGY who have contacted us personally, in response to our editorial[1] on the abuse of narcotics and other anesthesia-associated drugs by anesthesiologists and related professionals (*e.g.,* Certified Registered Nurse Anesthetists [CRNAs], Student Nurse Anesthetists, and Anesthesia Assistants), hereafter collectively referred to as anesthesia care providers (ACPs). The goal of our editorial was to promote scholarly discussion about the strengths and limitations of the anesthesiology community's current approach to dealing with drug-abusing ACPs. All who have commented seem to agree that the anesthesiology community is faced with a serious problem, but the question remains, "What should we do about it?" Underlying the messages of all who have spoken is a concern about striking a balance between preserving the personal and professional rights of ACPs found abusing these drugs *versus* protecting the health and safety of both the drug abusers and the vulnerable patients in their care. Clearly it is difficult to make optimally informed decisions given the lack of information on the scope of the problem, deficiencies in the current approach, and the outcomes of all drug abusers (including drug-abusing ACPs involved in ideal treatment programs *vs.* those receiving suboptimal monitoring and care).

Despite these limitations, the Federation of State Physician Health Programs (dealing with physician programs) and the National Organization of Alternative Programs (dealing with nursing programs) have labored to provide uniform standards for Health Professionals Programs (HPPs; *i.e.,* the individual state's programs primarily responsible for monitoring and caring for drug-abusing physicians and nurses). Those who have embraced these standards and designed optimal treatment and aftercare programs, and the ACPs who have diligently participated in those programs and returned to meaningful employment, are to be commended for their efforts. Although not all 50 states have such well-functioning HPPs, and although the exemplary programs are not universally successful in treating drug-abusing ACPs and returning them to the workplace, the exemplary programs nevertheless represent an ideal worth striving for. Successful HPPs should be celebrated, replicated, and *required* for addicted ACPs who seek to return to healthcare employment.

Consistent with this view, authors of four of the six letters commenting on our article (*i.e.,* Cohen, Earley, Skipper, and Specht) shared with readers the results reported by several studies conducted by state HPPs showing narcotic and related-drug abuse relapse rates for anesthesiologists no higher than with physicians in other specialties addicted to other drugs (most commonly alcohol). Of note, the authors of the 4 letters reported no deaths among the drug abusers. Skipper *et al.* refer to a subset of 102 addicted anesthesiologists with "slightly better outcomes and no deaths" in a recently published review of United States HPPs,[2] although there are no published data in the reference that would allow us to confirm this conclusion. Thus, we must take this claim at face value, without the ability to critique and criticize the underlying evidence.

Despite the optimistic picture provided by many of the letter authors, anesthesiologists continue to relapse and die, as documented by the literature.[3–5] That no deaths were captured in the data sets provided by the letter authors, and considering the small sample sizes involved in the various letter-writers' comments, we must reflect on a point made by one of the corresponding authors, Dr. Berry, in an 2000 editorial where he and a coauthor introduced an article that had studied cause-specific mortality risk in 40,000 anesthesiologists.[6] According to Berry and Fleisher, even with this large sample, the finding of a 34% excess risk of death of accidental poisoning (*i.e.,* fatal overdose) in male anesthesiologists when compared with the risk of the general population did not reach statistical significance. Berry and Fleisher suggested that an even larger sample or a longer period of follow-up would be necessary to detect small yet statistically significant increases in risk.[7] It is difficult to square this statement based on data from 40,000 anesthesiologists with the willingness of the current letter authors to rely on data sets that consist of 32,[8] 35,[9] 33,[10] and 102[2] presumably highly selected anesthesiologists to assert the relative safety of returning addicted anesthesiologists to the practice of clinical anesthesia. Skipper acknowledges the weakness of these data in a recent 2008 paper he coauthored concerning the effectiveness of HPPs, stating, "It is not possible from the evidence here to prove whether this form of support and monitoring for physicians with substance use disorders is appropriate, too harsh, or too permissive. Any episode of substance use in the context of patient care has the potential for considerable harm."[2] That an ACP who has suffered a relapse will almost certainly be caring for many patients between relapse and intervention is emphasized by Torri.

Others who contacted us independently of the correspondence section of ANESTHESIOLOGY (and, for readily apparent reasons, did not want to publicly share their information because of the personal and professional consequences of doing so) emphasized the negative aspects of our current approach to dealing with drug-abusing ACPs. Some described to us their experiences in dealing with personality disorders, dishonesty, and uncollegial behavior that accompanied drug-abusing ACPs and their (and others') efforts to cover up the abuse. Clearly these issues are not conducive to the type of cohesive work efforts required of a well-functioning anesthesia care team. And speaking of the anesthesia care team, we are troubled that only one author, Cohen, mentioned our CRNA colleagues, and then only to take us to task for not providing evidence of long-term monitoring of these individuals. The failure of the other authors to mention CRNAs and other nonphysician ACPs is perhaps explained by the fact that four of the six letters were authored by physicians who either work in programs specializing in the treatment of physician addiction or work with their state's HPP. As such, the authors might reasonably be expected to focus more on physicians. However, our dismal experience with relapse in drug-abusing nonphysician ACPs, when contrasted with the excellent results these authors claim in their letters, may, in part, explain these letter authors' bias against our proposed policy. But to answer Cohen, all but one of the CRNAs caught abusing workplace drugs left our employment by their own choice. Whether or not there was long-term monitoring in such cases is impossible to know, and the only follow-up we receive is from sad tales through old friends of multiple relapses and, in several situations, deaths. The one CRNA who remained in our employ relapsed multiple times and was ultimately dismissed. This episode occurred in the mid-1980s, and the records of the level of aftercare are unavailable to us because of confidentiality concerns.

While some of the letter authors referenced best-practice models of care and the (possible) acceptable outcomes they provide, it is clear that not all ACPs, including many of our CRNA colleagues, receive such superb care and aftercare. The expense of residential chemical dependency care (approximately $25,000 for the first month and $7,000–$10,000 for subsequent months [Marvin Seppala, M.D., personal communication, e-mail January 6, 2009] is a significant obstruction to many lacking the financial wherewithal of a physician's income. Many have lost their job at this point, and such treatment would be financially ruinous. As such, they are often left to seek care in the outpatient setting, which many experts in chemical dependency feel may not offer the services and support required for successful long-term recovery. Even so, at approximately $5,000 to $9,000 for 6 to12 months of outpatient care, the cost may still be prohibitive (Marvin Seppala, M.D., personal communication, e-mail January 6, 2009). As well, the cost of the frequent (*e.g.,* initially 4–6-times monthly) monitoring of biologic specimens can be quite daunting (*e.g.,* a gas chromatography mass spectrometry test for fentanyl costs approximately $40 per sample, with an additional collection fee of $10 in one facility [Jones S, MN, Office Manager, Health Professionals Services Program, telephone conversation January 7, 2009]). Generally, this cost is borne by the employee, not the employer or an insurance company.

At present, the system (or, in some locales, lack of system) used to address drug-abusing anesthesiologists has wide disparities between best-practices and worst-practices. Hedberg* has proposed criteria that portend a good chance of success for return to the workplace. As suggested by several of the respondents when all of these criteria have been met, and the individual is reentering the workplace within the framework of a well-functioning HPP, we would concede that a second chance at anesthesia employment is not inappropriate. As these letter authors state, when all of these elements are present, considerable success can be expected. However, when one or more elements are missing, failure—assessed by recidivistic behavior and potentially death—becomes more likely.* As well, it must be pointed out that California, the state with the largest physician population in the United States, has recently shut down its HPP.† Quoting the President of the California Medical Board, ". . . the diversion (HPP) program not only did not protect the public, but it was a failed concept, despite 27 yr of efforts to improve it." He added, "Audit after audit showed the plan did not work for some participants. Abuse of the privilege of the program by some participants repeatedly put consumers at risk. Repeat offenders were pointed out in several audits as well as the ability for the participants to game the system." Clearly, not every HPP is an unmitigated success.

Despite statements to the contrary by many of the letter authors, it remains our belief that in many instances the current approach to the drug-abusing ACP is to assume that a premium should be placed on returning the provider back to anesthesiology practice, even when some of the critical elements of the aforementioned formula of Hedberg* are missing. We believe that, in the minds of many, this constitutes the "default" position. Our view was simply to approach this problem from the other end of the spectrum: *i.e.*, the default should be to *not* return the drug-abusing ACP to the practice of anesthesiology until we can ensure that all of the elements of the aforementioned formula are addressed. While we do not question the importance of clinical judgment in determining the treatment and aftercare most appropriate for an individual patient, we also believe that any omissions in the patient fulfilling all of the obligatory criteria of Hedberg‡ will dictate that the drug-abusing ACP is "out" of anesthesiology practice. Our recommendations suggest that anesthesiologists who have become addicts should move to a practice setting with a less access to potent anesthesia drugs. Nonphysician ACP colleagues would move into a clinical setting where narcotic control mechanisms (*e.g.,* witnessed administration and wasting) is possible, although doubtless at some loss of income and prestige.

In reply to Katz's concern about our lumping together of "anesthetic drugs" and "supplements," we concur that this was awkward wording. It was our desire to avoid verbosity while still conveying that we were speaking not only of parenteral opioid dependence, but also of propofol and volatile anesthetic abuse with their apparently equivalent risk of relapse and death. We stand corrected.

Clearly more research and practical application of the research findings are needed if we are to most appropriately care for those ACPs discovered to be abusing drugs. For example, are there any data to support the traditional 3- or 5-yr monitoring period? Given that one often hears chemical dependency experts state that "physicians are good at getting into compliance, but not good at getting into recovery," would not a lifelong monitoring program be more appropriate? We would admit that a "one strike, you're out" policy is overzealous should future research reveal that all addicted ACPs are receiving optimal care and aftercare, and that they in fact have no higher risk of death than practitioners in other areas of medicine. Until some future time when such data might become available, we believe that the path that presents the least potential harm is redirection into another area of practice those ACPs who have abused addictive drugs diverted from the workplace.

In closing, we applaud those authors who wrote to this journal to share with readers their exemplary experiences. Hopefully their experiences can be used as a beacon to guide others toward an ideal approach to dealing with drug-abusing ACPs, and to influence those locales where the approach to this problem is far less enlightened. However, before we concede that these programs represent a final solution for drug-abusing anesthesiologists and other ACPs, it is imperative that we have adequate research data (using valid study designs and outcome metrics, and appropriate data analysis) demonstrating these programs appropriately care for at- risk practitioners and the patients otherwise destined to be in their care.

* Hedberg EB. Anesthesiologists: Addicted to the drugs they administer. ASA Newsletter 2001; 65 (http://www.asahq.org/Newsletters/2001/05_01/hedberg0501.htm) Last accessed 1/27/09.

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Keith H. Berge, M.D.,§ Marvin D. Seppala, M.D., William L. Lanier, M.D. §Mayo Clinic, Rochester, Minnesota. berge.keith@mayo.edu

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In Reply:—We read the letters to the editor written in response to our review article[1] and the accompanying editorial[2] with great interest, and we are encouraged by the enthusiasm generated for this very important discussion.

Drs. Skipper and DuPont contest our assertion that "outcomes have not appreciably changed" during the period of time covered by our review (1992–2007), and cite three papers to support their position.[3–5] Each of these papers report similar positive outcomes for physicians treated and monitored by physician health programs, but they specifically do not indicate any improvement in outcomes in the periods covered (1991–2005). These reports support our assertion that "outcomes have not appreciably changed." In interpreting these studies, it is important to appreciate that the selection process, which is generally described as individuals who *complete* a multiyear program, tends to systematically eliminate early relapsers from the data set. Nonetheless, these are peer-reviewed reports that could and perhaps should have been cited in our review. We agree that treatment and monitoring by a physician health program is essential if an anesthesiologist wishes to return to clinical practice.

Skipper and DuPont also cite the lack of evidence for patient harm reported in the 2005 study by Domino *et al.*; however, lack of evidence is not the same as lack of harm. We believe is it both self serving for the addicted practitioner as well as somewhat irrational from a neurophysiologic perspective to argue that an individual who is managing a addiction that requires diverting medication from their patients is a competent anesthesia provider. One might argue that given a stable dose of methadone, one could be an attentive and focused anesthesiologist. As pointed out by Dr. Torri, when someone is diverting drugs and charting it on a patient's record, one need not look further for harm. To suggest that harm is only measurable in morbidity and mortality is indeed to minimize the role and value of modern anesthesia practice.

Although we had a serious discussion as to whether to suggest a "one strike, you're out" policy for anesthesia practitioners, we chose to suggest an individualized approach. It should be noted that asking a trained nurse or physician to find another specialty of medicine in which to practice is hardly draconian, and we find it difficult to assert that individuals have some form of right to return to the scene of the crime. We note that "out" could easily mean out of clinical medicine entirely, but even this scenario allows for alternative careers. However, we are also acutely aware of individuals who were treated for substance abuse who have been successfully practicing anesthesiology for 20 or more years without a relapse. Unfortunately, these cases are rare. The suggestion made by Berge *et al.* is a simple solution without ambiguity, but each case of addiction and recovery has its own narrative that we believe merits consideration. We applaud the assertion made by Dr. Katz that if, as a society, we are going to adopt a "one strike, you're out" policy, it should be based on evidence. However, we add with some resignation that the lack of appropriate evidence does not diminish the imperative to make decisions when confronted with an addicted colleague.

Ethan O. Bryson, M.D.,* Jeffrey H. Silverstein, M.D. *Mount Sinai School of Medicine, New York, New York. ethan.bryson@mountsinai.org

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Looking Beyond Model Fidelity

To the Editor:—We read with interest the article by Chandra *et al.* in which the authors address the cost-effectiveness of simulation-based teaching of procedural skills.[1] The authors compared an inexpensive low-fidelity simulator to a relatively expensive high-fidelity simulator for learning a complex psychomotor skill: Fiberoptic orotracheal intubation. They found that the high-fidelity simulator had no additional educational benefit.

These findings are consistent with the results of other research that has found low-fidelity models to be as effective as high-fidelity models

The above letter was sent to the authors of the referenced article. The authors did not feel that a response was required. —James C. Eisenach, M.D., Editor-in-Chief.