Lesson 296: Preanesthetic Assessment of the Elderly Patient with Coexisting Alcohol or Substance Use Disorder

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Read this article, reflect on the information presented, then go online and complete the lesson post-test and course evaluation before the termination date below. (CME credit is not valid past this date.) You must achieve a score of 80% or better to earn CME credit.

TIME TO COMPLETE ACTIVITY: 2 hours
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Professional Gaps

Recent reports by the American Association of Retired Persons and press releases have highlighted a growing problem with drug and alcohol addiction in the elderly population that is both doctor- and patient-induced. This information should be emphasized to the anesthesia community because of potential drug interactions and other perioperative concerns.
Learning Objectives

At the end of this activity, the participant should be able to:
1. Describe the altered physiology that occurs during withdrawal.
2. List the potential anesthetic problems associated with substance abuse.
3. Identify postanesthetic complications of the newly sober elderly patient.
4. Describe the altered effects of different anesthetic agents in this patient population.
5. Discuss the altered physiology of the geriatric patient.
6. Identify potential drug–drug interactions, including alcohol.
7. Identify potential medical consequences of substance abuse.
8. Outline a plan for appropriate intraoperative monitoring.
9. Present a plan for appropriate intraoperative monitoring.
10. Identify appropriate referral sources for continued recovery of the elderly patient.

Case History

A 74-year-old woman presented for surgical repair of a hip fracture 2 days after falling. She reported that she had fallen because she might have had “one too many” cocktails and was unsteady on her feet. Her medical history was significant for hypertension, osteoporosis, chronic lower back pain, and mild anxiety. Her medications included metoprolol, amlodipine, spironolactone, oxycodone, zolpidem, and alprazolam. The patient was widowed and lived alone. Her son and her daughter accompanied her to the hospital and expressed concern that their mother might be drinking too much and was often confused.

Introduction

In December 2009, the Substance Abuse and Mental Health Services Administration reported that 4.3 million adults over the age of 50 years had used an illicit drug in the past year. The number of older adults with problems related to substance abuse and alcohol use is expected to double by the year 2020 and has been a topic of discussions by the Anesthesia Patient Safety Foundation.

Alcohol and substance abuse among the elderly population is a hidden national epidemic. It is believed that about 10% of the population of the United States abuses alcohol, but surveys have revealed that as many as 17% of adults over age 65 have an alcohol abuse problem. A researcher at the University of Kentucky, College of Medicine, in Lexington, found that 2.5 million older adults and 21% of older hospitalized patients had alcohol-related problems.\(^1\)

Elderly alcohol abusers can be divided into 2 general types: the “hardy survivors,” who have been abusing alcohol for many years and have reached age 65, and the “late-onset” group, who begin abusing alcohol later in life. Alcohol abuse in the latter group often is triggered by life changes, such as retirement; death or separation from a family member, a friend, or a pet; health concerns; reduced income; sleep impairment; and familial conflict.

The metabolic absorption rate of alcohol is higher in the elderly and in women than in younger individuals and in men. Thus, the same amount of alcohol results in higher blood alcohol levels in the former group, causing a greater degree of intoxication.
Drug interactions and the often unexpected effects of anesthetic agents that occur in the elderly patient in withdrawal can complicate anesthetic care. Because of the patient’s altered physiology, critical situations may arise at any time. The anesthesiology care provider should be aware of potential problems and how they can best be managed.

It is increasingly common for elderly trauma patients to have coexisting drug addiction and alcoholism. The American Society of Anesthesiologists has indicated that the anesthesiologist is well positioned to intervene to direct the trauma patient to a recovery program. Hospital admission may present a teachable moment when the anesthesia care provider can offer the necessary support to an addicted patient to get into a recovery program.

Preanesthetic Assessment

In the case presented, the patient had a clear surgical need. Despite her recent alcohol use, she was not currently intoxicated. However, the effects of chronic substance use and possible withdrawal might have complicated her intraoperative management.

The drug- and alcohol-abusing patient is at high risk for many related medical problems that potentially complicate anesthetic management. For many addicted patients, admission to the hospital for surgical intervention related to an injury sustained while intoxicated represents their “bottom” or low point, during which they may be more responsive to interventions aimed at initiating a program of recovery. Depending on the individual, his or her health status, and personal relationships, there may be a number of reasons why an elderly person becomes addicted to alcohol or drugs. Special considerations for the geriatric patient who is abusing drugs include:

- **Physical pain**: can be chronic resulting from deterioration with aging, or acute such as postoperative pain that is not well controlled.
- **Emotional pain**: can be especially prevalent in isolated patients and widowed individuals who may not have the support of family or friends.
- **Confusion**: such as in the early stages of Alzheimer’s disease, that can be caused by or result in unintentional abuse of prescription medication.
- **Insomnia**: caused by a lack of daytime activity or frequent napping.

A detailed history and physical examination of the patient are essential. Many substance-abusing patients have experienced a withdrawal. In the geriatric population, a lack of prescription analgesics or sleeping aids (eg, expired prescriptions and an inability to renew them) may be causative. Patients often are honest regarding their drug use in order to avoid experiencing the discomfort of pain or sleeplessness again, provided the questions are posed in a nonaccusatory manner. Younger patients may exaggerate their daily opioid use in an attempt to receive more of the drug, whereas geriatric patients who imbibe or use hypnotics may downplay the extent of their use.

In this case, although the patient had received opioids for a legitimate medical need, the dose and frequency needed to be addressed, as well as the hazards of combining these drugs with alcohol. In general, specific questions should be posed, without leaving room for interpretation—for example, “How much alcohol do you drink each day?” instead of “Do you drink alcohol?”

Geriatric patients may not realize that they are drinking to excess and blame empty bottles on pilfering
by caregivers. It is essential to find out how much of a drug the patient has been taking, in addition to when they last used it. Some patients might not consider marijuana or other substances to be a drug, thus direct questions about specific agents are important. If a patient says, “No,” it is reasonable to probe further and ask “Never?” or “Have you ever?” It is not unusual for elderly patients to indulge or experiment with drugs such as marijuana so as to appear “cool” to their children who may be using those drugs themselves.

When assessing the addicted patient, it is important not to stereotype. The disease of addiction does not discriminate according to age or appearance. Establish a comfort level by asking every patient, from a young man in his 20s to a woman in her 80s, the same questions.

The signs commonly seen in an alcoholic of a younger age such as problems at work and marriage difficulties may not be present in the older alcoholic. The disease of alcoholism in the elderly patient who no longer works or whose spouse has died may slowly progress undetected until an acute injury brings it to light. These patients are much less likely to voluntarily enter a rehabilitation program. Body language and the volume and tone of voice of the health care worker are important; all patients deserve privacy, respect, and kindness.

Inappropriate questioning can make patients feel that they are being judged, and lead them to give less than honest answers. If the patient appears hesitant to answer, it might help to say something like, “I am not the police; I am not here to judge you. I only need to know these things so that I can care for you in a safe and effective manner.”

Universal precautions should always be observed. In the case of an obtunded patient who cannot provide his or her history, it is appropriate to inquire about the patient’s drug use from friends or family.

**Complications of Perioperative Alcohol Use**

Acute alcohol intoxication has been associated with increased risk for traumatic injury (eg, related to falls) that can complicate the patient’s medical management, perioperatively. In the patient who is acutely intoxicated, common findings include nystagmus, slurred speech, unsteady gait, and inability to coordinate gross motor functions. Polysubstance abuse is common and intoxication with other drugs of abuse (more likely medically prescribed), or interaction between medications and alcohol, also must be considered.

Chronic alcohol consumption can lead to problems affecting almost all organ systems (Table 1), including a variety of neurologic deficits. Patients should be evaluated for signs of cerebellar degeneration and cerebral atrophy because acute intoxication may mask signs of chronic dysfunction. Thiamine deficiency can result in Wernicke’s encephalopathy, which should be considered in the confused patient with encephalopathy, oculomotor dysfunction, and gait ataxia. If left untreated, this disorder can progress to Korsakoff’s syndrome, resulting in selective anterograde and retrograde amnesia. Dilated cardiomyopathy, dysrhythmias, and hypertension should be considered, as well as peripheral neuropathy which should be documented prior to administration of neuraxial anesthesia.

In a recent study, 20% of adult patients presenting for surgery were found to have a history of problematic alcohol use that ranged in severity from hazardous use and harmful consumption to abuse and dependence. Of these patients, almost 50% were physically dependent on alcohol and at risk for...
alcohol withdrawal syndrome (AWS).

There is a linear dose–response relation between hazardous drinking and postoperative morbidity. The rate of complications in patients who consume 3 to 4 drinks per day is 50% higher than in those who consume 0 to 2 drinks. In patients who consume more than 5 drinks per day, the complication rate increases by 200% to 400%.

Postsurgical morbidity and mortality is 2 to 5 times greater in the chronic alcoholic than in the general population, regardless of the surgical procedure. Complications include not only AWS, but also higher rates of postoperative infections, and increased risk for cardiovascular complications including dysrhythmias, sudden cardiac death, and hemorrhage.

AWS is a potentially life-threatening condition that develops in up to 25% of alcohol-dependent patients. Mortality may reach 15% if AWS is not identified early and treated; even with proper treatment, the mortality rate is 2%.4

The pathophysiology of this syndrome is complex, but can be thought of as the reverse of intoxication. An increase in excitatory brain processes coupled with a decrease in activity of inhibitory processes usually develop within 6 to 24 hours after the last drink. Autonomic hyperactivity appears early, generally peaking in the first 24 to 48 hours with tremulousness, sweating, nausea, vomiting, anxiety, and agitation. If left untreated, neuronal excitation can progress to grand mal seizures.

Following its initial symptoms, untreated AWS may lead to delirium tremens characterized by hallucinations (auditory and visual), disorientation, severe autonomic hyperactivity, and death secondary to cardiovascular or respiratory collapse.

**Complications of Perioperative Drug Use**

Chronic substance abuse is commonly associated with developing a tolerance to the drug’s effects. Patients with chronic substance abuse—regardless of the drug being abused—often require a greater

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Table 1. Medical Conditions Associated With Chronic Alcohol Use

<table>
<thead>
<tr>
<th>Organ System</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central nervous system</td>
<td>Wernicke-Korsakoff syndrome, alcohol withdrawal syndrome, cerebellar degeneration, cerebral atrophy</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>Dilated alcoholic cardiomyopathy, dysrhythmias, hypertension</td>
</tr>
<tr>
<td>Gastrointestinal and hepatobiliary</td>
<td>Esophagitis, gastritis, pancreatitis, liver cirrhosis, portal hypertension, esophageal varices</td>
</tr>
<tr>
<td>Skin and musculoskeletal</td>
<td>Myopathy, osteoporosis</td>
</tr>
<tr>
<td>Endocrine and metabolic</td>
<td>Ketoacidosis, hypalbuminemia, hypomagnesemia</td>
</tr>
<tr>
<td>Hematologic</td>
<td>Thrombocytopenia, leukopenia, anemia</td>
</tr>
</tbody>
</table>
amount of opioid anesthetics per weight than other patients. This results from development of a cross
tolerance to different classes of agents.

Care of the patient who has been abusing stimulants such as cocaine, methamphetamines, and related
drugs presents additional concerns during the perioperative period. Abuse of such agents can result in
altered physiology that persists for days after the last ingestion.

Like ephedrine, the primary mechanism of action of these drugs involves indirect sympathetic
activation either by increased release, or decreased reuptake, of norepinephrine, dopamine, and
serotonin from terminals in the central and autonomic nervous systems. Chronic abuse leads to
catecholamine depletion that persists even though the patient has stopped active use. How long this
depletion lasts is unclear, and thus direct-acting sympathomimetics such as phenylephrine should be
used instead of indirect-acting agents in treating hypotension. The elderly patient who abuses alcohol
and also takes angiotensin-converting enzyme inhibitors, and who becomes hypotensive
intraoperatively, may respond best to vasopressin and methylene blue.

Cocaine is both a direct- and indirect-acting agent that stimulates the sympathetic nervous system by
blocking the presynaptic uptake of norepinephrine and dopamine, and also by directly stimulating
dopaminergic receptors. Catecholamine depletion is seen more often with amphetamine use than in
the cocaine-abusing patient.

The composition of drugs produced illicitly—and not regulated—varies widely. Often, the white
powder sold as cocaine also contains methamphetamines, among other compounds. Long-term use of
amphetamines and cocaine warrants concern about cardiac dysrhythmias, even in the patient who is
not acutely intoxicated. If time permits, such patients may benefit from a focused cardiovascular
assessment, if appropriate.

**Medical Consequences of Substance Abuse**

Addicted patients may appear to be healthier than they really are. Each case is different, but prolonged
substance abuse should raise suspicion of organ damage; appropriate testing such as coagulation
studies, liver function tests, or hepatitis panel may be necessary.

The route of drug ingestion also has implications. For example, parenteral abuse is associated with an
increased risk for blood-borne viral infections such as HIV, hepatitis C, and hepatitis B—either through
the sharing of injection equipment, or from unsafe sexual activities while intoxicated. Although both
scenarios are less likely in the geriatric population, a recent increase in the incidence of sexually
transmitted diseases among nursing home patients suggests that the possibility exists.

Obtaining peripheral IV access often is a challenge in IV drug users. In patients abusing inhaled drugs
(particularly methamphetamine), a thorough airway assessment is warranted because the smoke can
be corrosive to dentition. Chronic marijuana smokers may present clinically with obstructive lung
disease. In patients who report nasal administration—common with snorted cocaine or heroin—
cautions is warranted when inserting a nasogastric tube or nasal endotracheal tube because of nasal-septum atrophy.

All users are at risk for drug dependency and overdose; many also may have associated mental health
problems such as depression, anxiety, post-traumatic stress disorder, and sleeping disturbances. Cigarette smoking, obesity or other eating disorders, and chronic pain are common.

Interactions With Prescription Drugs

Alcohol abuse in this generation is complicated by the use of prescription and over-the-counter (OTC) medications. The elderly population spends more than $500 million annually on medications. Combining medications and alcohol frequently results in significant adverse reactions.

Reduced blood flow to the liver and kidneys in the elderly result in a 50% decrease in the rate of metabolism of some medications, especially benzodiazepines. Additionally, the long half-lives (often several days) of chloridiazepoxide and diazepam in the elderly cause prolonged sedation from these drugs; combined with the sedative effects of alcohol, the risk for falls and fractures can be elevated. Users of benzodiazepines can become confused and take additional doses. Veterans from the Korean or Vietnamese campaigns may have addictions to a wide variety of drugs that they continue to consume into their 80s and 90s.

It is evident that geriatric patients often are prescribed many medications. As office visits become shorter because of financial constraints, the tendency of health care providers is to advocate mood-altering and antidepressant drugs rather than to listen more closely to patients’ problems. Benzodiazepines, monoamine oxidase inhibitors (MAOIs), and selective serotonin reuptake inhibitors often are given. MAO-A inhibition reduces the breakdown of primarily serotonin, epinephrine, and norepinephrine, and thus there is a higher risk for serotonin syndrome or a hypertensive crisis.

When ingested, MAOIs slow the catabolism of dietary amines. Consumption of foods containing tryptophan, for example, may result in hyperserotonemia. The amount of tryptophan required to cause a reaction varies greatly among individuals, and depends on the degree of inhibition, which in turn depends on dosage and selectivity.

Tyramine is broken down by MAO-A and MAO-B. Because inhibiting the action of MAO may result in its excessive buildup, the patient’s diet must be monitored for tyramine intake. When foods containing tyramine are consumed, a hypertensive crisis may develop (the so-called “cheese effect”). MAO-B inhibition reduces the breakdown mainly of dopamine and phenylethylamine, so there are no dietary restrictions associated with this class of drugs, unless the dosage is high.

The exact mechanism by which tyramine causes a hypertensive reaction is not well understood, but it is assumed that tyramine displaces norepinephrine from the storage vesicles and may trigger a cascade in which excessive amounts of norepinephrine can lead to a hypertensive crisis. Another theory suggests that proliferation and accumulation of catecholamines causes hypertensive crisis.

Foods and drinks with potentially high levels of tyramine include liver, fermented substances such as alcoholic beverages, and aged cheeses. Certain meat extracts and yeast extracts (eg, Bovril, Marmite, and Vegemite)—often popular among the geriatric population—contain extremely high levels of tyramine, and should not be taken with these medications or alcohol. The most significant risk associated with MAOIs is the potential for interactions with OTC and prescription medicines, illicit drugs or medications, and certain supplements (eg, St. John’s wort). MAOI interactions with other drugs and certain foods are of particular concern for elderly patients who may feel depressed from
adhering to dietary restrictions, and “don’t care if they live or die.”

The use of OTC medications, solely or in combination with alcohol, also can have serious consequences. Laxatives, for example, can cause chronic diarrhea, which can lead to a sodium and potassium imbalance and dysrhythmias. Antihistamines, another popular OTC medication, can cause confusion; cold medications can elevate blood pressure and lead to strokes. Caffeine is frequently added to OTC medications, causing anxiety and insomnia. Often, the mixing of alcohol and OTC medications increases the occurrence of side effects and can intensify negative consequences.

Nicotine dependence is a significant problem in the elderly, related to both addiction and boredom. The use of nicotine early in life sets the stage for morbidity and mortality from this addiction. More than 400,000 people in the United States die each year from smoking-related diseases. Elderly smokers not only continue to impair their respiratory systems, but also are more apt to die of respiratory diseases.

The addictive potential of nicotine is manifested after coadministration of an MAOI. In rats, this combination specifically causes sensitization of the locomotor response, which is a measure of addictive potential. This may be reflected in the difficulties associated with smoking cessation, as tobacco contains a naturally occurring MAOI, in addition to the nicotine. Nicotine replacement products work successfully in the geriatric population, especially when combined with behavioral, supportive, and other therapies.

In summary, MAOIs should not be combined with other psychoactive substances, such as antidepressants, pain-killers, stimulants (both legal and illegal), or alcohol. Combinations that can be fatal include MAOIs and selective serotonin reuptake inhibitors, tricyclics, methylenedioxymethamphetamine, meperidine, tramadol, or dextromethorphan.

Postoperative Pain Management

Hyperalgesia or hyperesthesia is common in the substance-abusing patient. Characterized by dramatically increased sensitivity to painful stimuli, this phenomenon is thought to develop through a spinal sensitization to glutamate and substance P. The chronic substance abuser may become hypersensitive to surgical and other stimuli, in addition to developing tolerance. These patients often will require even higher doses of anesthetic agents than would be expected from tolerance alone.

Allodynia also may be present, whereby stimuli that normally are not painful to the patient may elicit the sensation of pain. Development of these phenomena may result from activity of N-methyl-D-aspartate (NMDA) receptor agonists. NMDA antagonists, such as ketamine, may be effective in relieving hyperalgesia and should be considered in refractory cases.

Local anesthesia, whether administered directly in the surgical field or as a regional technique, can reduce the need for opioids. Regional techniques should be offered to the patient whenever appropriate, especially in cases of opioid tolerance or opioid-induced hyperalgesia. Suggested doses for adjuvant therapy for alternative methods of pain control are presented in Table 2. It should be noted that the opioid-tolerant elderly patient may require even lower doses of these medications. A “start low and go slow” approach is prudent.
Suggesting a Program of Recovery

A certain degree of denial, rationalization, and minimizing can be expected when the addict or alcoholic is confronted. Often it is beneficial for the health care worker to conceptualize—separating the patient from the disease. If frustrated, the provider should direct negative sentiments at the disease instead of the patient. Ultimately the patient, who can begin to take responsibility for recovery, recognizes addiction. Often a well-timed push in the right direction can make a significant difference.

Many anesthesia care providers might be uncomfortable bringing up the topic of substance abuse, and may not know what to say. To open a dialogue with the patient about the extent of his or her drug use, it is helpful to pose questions that are open-ended and that also encourage reflection. By asking questions such as the following, the health care worker is encouraging the addicted patient to consider the current situation and health consequences of continued drug use:

- “Have you thought that perhaps you fell because of your drinking/drug use?”
- “Have you ever considered drinking less?”
- “Have you ever thought that you do not have to live like this anymore?”

The postoperative check is the perfect time to broach the subject by inquiring about the patient’s plans after discharge; this may open a discussion about possible referral to an inpatient treatment center or sober community.

Patients may become defensive at suggestions of addiction. The addict who is in denial may respond better to a statement such as, “I am not necessarily saying that you have these problems; however, we do see a lot of people here who have a problem with drugs or alcohol, and have sustained injuries exactly like yours. Please think about it.”
Challenges that are unique to the addicted elderly patient may present barriers to treatment; these include matters of pride, economic restraints, and failing health. It can be very difficult for elderly patients who have lived long lives, raised families, and been successful, to view themselves as “drug addicts,” when they should be enjoying their golden years. As well, many of the physical symptoms of drug withdrawal may be too hard for the older patient in ill health to tolerate. Treatment should be expedited to prevent a further decline in health, but detoxification should proceed only in a medically monitored setting.

Elderly patients already may have tried to become sober through self-help groups such as Alcoholics Anonymous, and may feel discouraged that it did not work for them. Some may have been involved in minor traffic accidents and had their driver’s license suspended because of alcohol-related problems that they might have attributed to poor eyesight or mechanical problems with a car. These patients should be encouraged to seek help again. Addiction is a chronic, relapsing disease and multiple attempts often are necessary before lasting sobriety is achieved. It is important to request discharge planning and social work for appropriate referrals.

Patients may not be interested in sobriety when they feel better prior to discharge, so the idea of entering a program should be broached early on—often with the support of family members. Not all patients will have access to the Internet, so local telephone numbers of the following organizations should be provided to patients:

- Alcoholics Anonymous (www.aa.org)
- Narcotics Anonymous (www.na.org)
- Cocaine Anonymous (www.ca.org)

It also is important to tell patients that meetings of these anonymous programs are free and widely available in most areas. Family members should be encouraged to help with transportation if necessary. Anesthesiologists perform a disservice when they treat the acute needs of the patient, but do not address the underlying problem of addiction, which often has contributed to the patient’s condition.

**Management of the Case Presented**

Given the patient’s history of substance use, the diagnosis of alcohol use disorder (AUD) was considered. Preanesthetic assessment included use of the CAGE questionnaire (Figure 1) and AUDIT questionnaire to evaluate the patient. Answers provided on these two screening tools suggested AUD. Subsequently, a discussion was held with the orthopedic surgeon regarding the urgency of hip fracture repair and risks to the patient of proceeding.

The consensus was that surgery should not be postponed until after the patient’s treatment and detoxification—which would require a minimum period of abstinence of 4 weeks. It was decided that inhibition of the sympathetic symptoms of withdrawal would be instituted with low-dose morphine (15 mcg/kg per hour) before induction of anesthesia, and for 3 days, postoperatively. Parenteral thiamine was administered preoperatively, and maintained for 5 days postoperatively to prevent "Wernicke’s encephalopathy and Korsakoff’s syndrome."
The decision was made to proceed with spinal anesthesia for the procedure so that the patient could be monitored for signs of AWS, intraoperatively. Because the potential for clotting abnormalities is elevated in patients with alcoholic liver disease, prothrombin time and partial thromboplastin time levels were confirmed within normal limits before regional anesthesia was administered. Additionally, because chronic alcoholics may need higher doses of anesthetics, secondary to cross tolerance or metabolic tolerance (induced P450 system), the decision was made to avoid general anesthesia if at all possible.

Surgery proceeded without incident; premedication with benzodiazepines to prevent withdrawal delirium in the postoperative period was not necessary. The patient did not develop autonomic instability. In the postoperative period, while the patient was recovering, a family meeting was arranged to discuss the patient’s diagnosis of AUD. Arrangements were made for direct admission to an inpatient rehabilitation facility at discharge, should the patient be amenable to such a plan.

Conclusion

Alcohol and drug abuse may be difficult to detect in the elderly patient. A list published by the Center for Substance Abuse Treatment (Substance Abuse and Mental Health Services Administration, Rockville, Maryland) describes signals that might indicate an alcohol- or medication-related problem in an elderly person.

Therapy of these elderly patients centers around education for, and from, health care providers, family, and pharmacies; increased attention by the patient’s family, that includes maintaining a medication inventory; attempts at increasing activity levels of the patient; and patient participation in the Twelve-Steps, or other self-help and support-group programs.

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REFERENCES


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Post-test

Post-Test

1. The patient in alcohol withdrawal will likely exhibit:
   a. nystagmus, slurred speech, an unsteady gait, and inability to coordinate gross motor functions
   b. obtundation and difficulty in arousal
   c. tremulousness, sweating, nausea, vomiting, anxiety, and agitation
   d. no specific signs or symptoms

2. Potential anesthesia problems associated with substance abuse include:
   a. altered physiology that persists for days after the last ingestion
   b. tolerance to opioids and other anesthetics
   c. appearing healthier than his or her actual health status
   d. all of the above

3. Postanesthetic complications of the newly sober patient include:
   a. dramatically increased sensitivity to painful stimuli
   b. decreased incidence of withdrawal syndrome
   c. decreased incidence of postoperative wound infections
   d. decreased incidence of postoperative bleeding

4. Which of the following is a true statement about the altered effects of anesthetic agents in elderly patients who are drug- or alcohol-addicted?
   a. Propofol does not reliably induce general anesthesia in this population.
   b. Patients often will require a greater amount of opioid anesthetics per weight than the patient who is not abusing drugs.
   c. Ephedrine is the preferred drug for treatment of hypotension in these patients.
   d. In these patients, dopamine will not increase the blood pressure.

5. The potential medical consequences of substance abuse include:
   a. blood-borne viral infections
   b. obstructive lung disease
   c. atrophy of the nasal septum
   d. all of the above
6. Which of the following is a consideration for pain management in the newly sober patient?
   a. Hyperalgesia or hyperesthesia is not common in the substance-abusing patient.
   b. Allodynia may exist, and normally nonpainful stimuli may elicit the sensation of pain.
   c. N-methyl-D-aspartate antagonists, such as ketamine, are not effective in the reduction of hyperalgesia.
   d. Regional anesthesia should not be offered when there is tolerance of opioids or opioid-induced hyperalgesia.

7. When suggesting a program of recovery to the drug- or alcohol-abusing patient:
   a. denial, rationalization, and minimizing are rarely evident
   b. it is acceptable to be upset with the patient because it is not the job of the health care provider to address these issues
   c. the individual does not need to take responsibility for his or her own recovery
   d. a well-timed push in the right direction can make a significant difference in the patient’s life or health

8. Which of the following are appropriate referral sources for patients’ continued recovery?
   a. Self-help programs such as Alcoholics Anonymous and Narcotics Anonymous
   b. Inpatient treatment programs for medical detoxification, followed by therapy
   c. Outpatient treatment programs
   d. All of the above

9. What level of alcohol use suggests that a patient may have alcohol use disorder?
   a. Alcohol used socially on a monthly basis
   b. 1 to 2 drinks per day
   c. More than 2 drinks per day
   d. Alcohol is a legal drug and has not been associated with any use disorder.

10. The patient who drinks more than 2 servings of alcohol per day has an increased risk for which perioperative complication?
    a. Sudden cardiac death
    b. Pulmonary embolism
    c. Decreased tolerance to anesthetic agents
    d. Intraoperative hypotension