Identification and management of unhealthy alcohol use in the perioperative period

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INTRODUCTION

Patients with unhealthy alcohol use face multiple risks in the perioperative period. Along the continuum of alcohol consumption, alcohol use, unhealthy alcohol use, and alcohol use disorder impart greater risks to perioperative morbidity. Unhealthy alcohol use is an amount of alcohol consumed that places a person at risk for alcohol-related events. Unhealthy alcohol use does not necessarily indicate that the patient has an alcohol use disorder; unhealthy alcohol consumption is a spectrum of alcohol consumption from risky alcohol consumption to alcohol use disorder. Patients with unhealthy alcohol use, with or without alcohol withdrawal syndrome, have an elevated risk of alcohol-associated medical and psychiatric problems, which if present can contribute to complications in the perioperative period. Alcohol consumption may interact with perioperative medications (eg, anesthetics, analgesics) and can contribute to compliance with postoperative treatment or postoperative recovery.

Patients anticipated to have surgery should be screened for unhealthy alcohol use. Those assessed with or suspected of having frequent heavy use could be encouraged to undergo medically supervised withdrawal prior to surgery and should be monitored closely for alcohol withdrawal syndrome during the perioperative surgical period. If surgery is needed urgently, or medically supervised withdrawal is refused by the patient, for patients suspected to have physical dependence on alcohol, they should be treated prophylactically with benzodiazepines (or other agents) to prevent alcohol withdrawal syndrome and its associated complications. The

perioperative surgical period is an ideal time to identify and intervene on patients with unhealthy alcohol consumption. Patients with unhealthy drinking should always be educated about the consequences of their use and encouraged to participate in brief counseling or alcohol use disorder treatment, as appropriate.

This topic reviews the epidemiology, consequences, identification, and management of unhealthy alcohol use in patients who are undergoing surgical procedures. The epidemiology, clinical manifestations, course, assessment, diagnosis, and treatment of patients with alcohol use disorder are described separately. The diagnosis and management of alcohol withdrawal are also described separately.

- (See "Risky drinking and alcohol use disorder: Epidemiology, clinical features, adverse consequences, screening, and assessment".)
- (See "Screening for unhealthy use of alcohol and other drugs in primary care".)
- (See "Brief intervention for unhealthy alcohol and other drug use: Efficacy, adverse effects, and administration".)
- (See "Alcohol use disorder: Psychosocial management".)
- (See "Alcohol use disorder: Pharmacologic management".)
- (See "Management of moderate and severe alcohol withdrawal syndromes".)
- (See "Alcohol withdrawal: Ambulatory management".)

TERMINOLOGY

The identification and management of patients with unhealthy alcohol use in the perioperative period is aided by defining the spectrum of problems encountered. (See "Risky drinking and alcohol use disorder: Epidemiology, clinical features, adverse consequences, screening, and assessment".)

Unhealthy alcohol use — Unhealthy alcohol use encompasses the spectrum of alcohol use that can (but may not necessarily) result in health-related consequences, including risky alcohol use, which includes frequent or heavy alcohol use, and alcohol use disorder [1]. Patients with frequent and heavy alcohol use can, but not always, have physiologic dependence and have alcohol withdrawal syndrome, which can contribute to morbidity directly and through increased complications of surgery or of treatment in the postoperative period.

Risky alcohol use — Risky alcohol use refers to consumption of amounts of alcohol that places the patient at risk for health consequences. Thus, risky alcohol use – often called at-risk, heavy, and hazardous alcohol drinking – is defined by the amount a person drinks. Acute and

chronic conditions resulting from risky alcohol consumption include injuries, gastrointestinal bleeding, depression, sexually transmitted diseases, stroke, cancer, liver and heart disease, birth defects, perioperative complications, and alcohol use disorder. Many conditions that may occur or be exacerbated in patients who drink at risky levels may be further exacerbated by stress and treatment that naturally occur in patients in the perioperative period. For example, the increased risk of gastrointestinal bleeding, dyspepsia, and ulcers in the perioperative period may be additive to these risks in patients who drink at risky alcohol amounts.

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) in the United States has estimated consumption amounts of alcohol that increase health risks [2]:

- Men under age 65:
  - More than 14 standard drinks per week on average
  - More than 4 drinks on any day (or episode of drinking) in the last year
- Women and all adults 65 years and older:
  - More than 7 drinks per week on average
  - More than 3 drinks on any day (or episode of drinking) in the last year

Amounts are based on a standard drink, which is defined, in the United States, as 12 grams of ethanol, 5 ounces of wine, 12 ounces of beer, or 1.5 ounces of 80 proof spirits. The number and size of drinks used in these estimates vary internationally.

Specifying thresholds for risky alcohol use is an inexact science based on epidemiological evidence, and patients who drink just below these thresholds may have similar risks of those patients who drink just above these thresholds. While risky alcohol use is defined as a dichotomous "yes" and "no" state, risks of a myriad of untoward health consequences are often delineated along a continuum of consumption amounts.

Patients with frequent heavy alcohol use are more likely to have a moderate to severe alcohol use disorder, and are at increased perioperative risks from the medical consequences of alcohol use, as well as from physiologic dependence and potential withdrawal if alcohol is suddenly discontinued. Patients may have physical dependence on alcohol, with or without a formal diagnosis of alcohol use disorder.

Alcohol use disorder — In the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) [3], alcohol use disorder (which replaced the DSM-IV disorders alcohol abuse and alcohol dependence) is characterized by a pattern of alcohol use associated with clinically significant impairment or distress, as manifested by

multiple psychosocial, behavioral, or physiologic features [4]. As opposed to risky alcohol drinking, alcohol use disorder is not defined by the amount of alcohol consumption; physical dependence on alcohol is just one criterion for DSM-5 alcohol use disorder. Not all patients diagnosed with alcohol use disorder have physiologic dependence on alcohol and may not require or need management of alcohol withdrawal syndrome. Patients with risky alcohol consumption may not have physical dependence on alcohol and not experience alcohol withdrawal syndrome. It is rare, however, for a patient not be physically dependent on alcohol without either consuming unhealthy alcohol amounts or having a diagnosis of alcohol use disorder. (See "Risky drinking and alcohol use disorder: Epidemiology, clinical features, adverse consequences, screening, and assessment", section on 'Diagnosis'.)

Binge drinking — "Binge" drinking has been defined as "drinking so much within about two hours that blood alcohol concentration (BAC) levels reach 0.08g/dL" [2]. In women, this typically occurs after about four standard drinks, and, in men, after about five standard drinks. This term is consistent with heavy drinking episodes in the NIAAA definition of risky alcohol use. (See 'Risky alcohol use' above.)

EPIDEMIOLOGY

The prevalence of risky drinking in surgical patients is not precisely known, but is higher than in the general population. In a study of 2219 patients admitted to a university hospital trauma service, investigators tested 1602 patients for serum ethanol; 685 (43 percent of those tested) patients had a measurable level of ethanol [5].

In a study of consecutive inpatient admissions to a university hospital, investigators found that 23 percent of general surgery admissions, 12.5 percent of obstetrics-gynecology admissions, and 43 percent of otolaryngology admissions screened positive for a DSM-IV diagnosis of alcohol dependence [6]. The incidence of alcohol withdrawal syndrome is generally estimated to be two to five times higher in surgical and trauma patients compared with other inpatients [7,8].

Obesity combined with presentation for a gastric bypass procedure is strongly associated with a history of an alcohol use disorder and may be a risk factor for perioperative complications secondary to alcohol use. A longitudinal study of 199 patients who underwent bariatric surgery found that nearly 33 percent had a lifetime history of alcohol use disorder [9]. There is strong evidence that bariatric surgery leads to changes in alcohol metabolism after surgery [10-13]. Patients with obesity may have an increased risk of alcohol consumption and new onset of alcohol use disorder after bariatric surgery [14-16].

ALCOHOL-RELATED COMPLICATIONS

Unhealthy alcohol use contributes to surgical and postoperative complications [7,17,18]. Patients with unhealthy drinking have a higher likelihood of comorbid illnesses that can complicate surgery (eg, liver disease, dementia with risk of delirium). The effect of alcohol use on perioperative complications appears to be dose-dependent, with greater consumption incurring a higher rate and severity of perioperative consequences [18]. Common complications include:

- Infections:
  - Risky alcohol use is a significant independent risk factor for surgical site infections [19].
  - Alcohol-induced immune incompetence is believed to contribute to this risk. Risky alcohol use has been found to decrease T-cell activity and proliferation; delayed type-hypersensitivity (DTH) reactions have been shown to be decreased pre- and postoperatively in patients with unhealthy alcohol use [17].
- Wound disruption – Decreased protein accumulation and slower surgical wound healing among patients with alcohol use disorder has been demonstrated [20,21].
- Bleeding – Significantly higher bleeding times and an increased frequency of bleeding episodes requiring transfusion have been observed postoperatively in patients with unhealthy alcohol use [17,22].
- Cardiopulmonary insufficiency:
  - Risky alcohol use and alcohol use disorders are known to cause cardiomyopathy, and patients with unhealthy alcohol use have decreased preoperative ejection fractions compared with controls [23]. Depressed cardiac function may predispose patients to increased postoperative ischemia and arrhythmias [17,23]. (See "Alcohol-induced cardiomyopathy".)
  - Arrhythmias can develop in patients with unhealthy alcohol use without preexisting cardiac disease. The "holiday heart syndrome" refers to arrhythmias classically occurring after episodes of binge drinking, often atrial fibrillation [24-28]. Surgery is often a risk factor for heart problems, including arrhythmias, which can be compounded by concomitant unhealthy alcohol consumption. (See "Epidemiology, risk factors, and prevention of atrial fibrillation".)

- Liver disease – Alcohol-associated liver disease, including fatty liver, alcohol hepatitis and alcohol cirrhosis, may affect surgical risk. These subjects are discussed in greater detail separately. (See "Clinical manifestations and diagnosis of alcohol-associated fatty liver disease and cirrhosis" and "Management of alcohol-associated steatosis and alcohol-associated cirrhosis" and "Management and prognosis of alcoholic hepatitis" and "Alcoholic hepatitis: Clinical manifestations and diagnosis".)

- Prolonged length of stay – Longer lengths of stay in hospitals and in intensive care units have been seen among inpatients with unhealthy alcohol use compared with those without unhealthy alcohol use [29,30].

Alcohol withdrawal syndrome — Admission to a hospital or simply the perioperative period itself, whether inpatient or outpatient, often imposes abstinence on patients with unhealthy alcohol use, putting them at risk of alcohol withdrawal syndrome. Alcohol withdrawal syndrome is comprised of withdrawal signs and symptoms along with associated distress or impairment in social, occupational, or other important areas of functioning [31-33]. Among surgical patients with unhealthy drinking, patients who experience perioperative alcohol withdrawal have higher levels of morbidity than patients without withdrawal [7].

Mild to moderate symptoms of alcohol withdrawal include:

- Insomnia
- Tremulousness
- Mild anxiety
- Gastrointestinal upset
- Anorexia
- Headache
- Diaphoresis
- Palpitations
- Tachycardia
- Hypertension

Symptoms of severe alcohol withdrawal, which can be life threatening, include:

- Disorientation
- Hyperthermia
- Agitation
- Hallucinations
- Seizures

The time course for the development of alcohol withdrawal syndrome varies, often from individual to individual and by the nature, frequency, and volume of the alcohol consumption by the individual prior to alcohol cessation. Early symptoms of alcohol withdrawal syndrome can begin as early as two hours after cessation of or significant reduction in alcohol consumption. Severe alcohol withdrawal syndrome symptoms typically peak within four days after onset and usually subside within a week (table 1). Seizures and hallucinations, however, can occur early in the course of withdrawal and in the absence of hyperautonomic symptoms. (See "Management of moderate and severe alcohol withdrawal syndromes".)

It is important, if possible, to query patients about their typical alcohol withdrawal syndrome, to help planning prophylactic or definitive treatment for a particular individual. Clinical manifestations, course, diagnosis, and management of alcohol withdrawal is discussed in detail separately. (See "Management of moderate and severe alcohol withdrawal syndromes" and "Alcohol withdrawal: Ambulatory management".)

Intraoperative issues — Unhealthy alcohol use among surgical patients can complicate the administration and dosing of anesthesia and analgesia, due to widespread and complex effects of alcohol on virtually all systems. Any patient with a history of regular alcohol consumption may require additional anesthesia. Studies have documented increased anesthesia requirements for both induction and analgesia among patients with unhealthy alcohol use [34-36]:

- Patients consuming greater than 40 g of alcohol/day for at least two years have been found to require more propofol to induce anesthesia compared with patients without unhealthy use (<40 g alcohol/day) or who did not consume alcohol [34].
- Patients with DSM-IV alcohol dependence have been found to require significantly larger doses of fentanyl than those without a diagnosis of alcohol dependence to achieve adequate analgesia at the time of surgery [35,36].

Acute alcohol consumption prior to surgery may prolong the duration of action of several medications used perioperatively, including propranolol and phenobarbital [37]. Chronic alcohol consumption induces the cytochrome P-450 system, potentially shortening the duration of action of other medications used perioperatively.

Patients with unhealthy drinking experience increased surgical stress. Acute physical stress activates the hypothalamic-pituitary-adrenal (HPA) axis, resulting in increased serum cortisol levels. Surgery is a known potent stimulus for HPA activation. The "surgical stress" response triggers multiple physiologic changes including increased heart rate, elevated blood pressure, and increased plasma catecholamine levels. The stress response begins at the time of incision,

peaks upon cessation of anesthesia and return of pain sensation, and continues throughout the postoperative period [38].

A number of intraoperative complications common in patients with unhealthy alcohol use can affect hemostasis. A study of patients with traumatic hemorrhage found patients with unhealthy alcohol use less able to maintain adequate blood pressures during surgery [39]. Intraoperative episodes of hypoxemia or hypotension increase the risk of postoperative delirium in patients with unhealthy alcohol use [40].

SCREENING AND INITIAL ASSESSMENT

It is important in the preoperative period to identify patients at risk of perioperative complications. All preoperative patients should be assessed for quantity, frequency, and recency of alcohol use. This allows clinicians to anticipate operative and postoperative complications.

The primary function of screening in the preoperative period is to ensure that persons with unhealthy alcohol use are identified. If identified, practitioners should assess for risky alcohol use and alcohol use disorders and for potential physical alcohol dependence, which can cause alcohol withdrawal syndrome. Screening instruments and approaches to severity assessment are described in greater detail separately. (See "Screening for unhealthy use of alcohol and other drugs in primary care", section on 'Screening tests'.)

There exists several instruments to screen for unhealthy alcohol consumption that may be appropriate for use in the perioperative period. For example, the three-item Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) can screen for unhealthy alcohol use prior to surgery. A score of 5 or more in the year before surgery has been associated with increased postoperative complications [19]. An alternative is to screen with a single question: "How many times in the past year have you had five or more drinks in a day (four for women)". A response of one or more indicates unhealthy use. Patients screening positive should be assessed for quantity, frequency, and recency of use. In addition, they should then be screened for alcohol use disorder, using standard instruments.

Patients with heavy drinking episodes (identifiable through the AUDIT-C or single screening question described above) are at risk of alcohol withdrawal syndrome. For such patients, they should be inquired about their last drink, the volume of recent consumption, and history of withdrawal symptoms. If they do have a history of withdrawal, they should be carefully questioned about their typical course of alcohol withdrawal including history of major

consequences of withdrawal (eg, timing and duration of hallucinations, seizures, delirium tremens).

Some patients may not disclose their alcohol consumption in the perioperative period (eg, due to fear of not having elective surgery), or may not be able to do so (eg, under sedation, unconscious). Inquiry to patterns of alcohol consumption should be made in a nonthreatening manner without fear of retribution or consequences to the patient. Surrogate interviews, medical history, physical examination, and laboratory studies can provide information on alcohol consumption, signs and symptoms of unhealthy alcohol use, alcohol withdrawal, and resulting end-organ damage.

- Risk factors that suggest possible physiologic alcohol dependence include presentation with alcohol intoxication or a detectable (and particularly a high) blood or breath alcohol level or a past history of alcohol withdrawal symptoms. The emergence of alcohol withdrawal symptoms may be the first sign of physiologic dependence in some patients. Risk factors associated with severe and prolonged withdrawal including amount and duration of alcohol use, prior withdrawal episodes, recurrent detoxifications, older age, and comorbid disease, are described separately. (See "Management of moderate and severe alcohol withdrawal syndromes", section on 'Risk factors'.)

- Physical examination findings indicative of acute or chronic hepatic injury can aid diagnosis but are generally not sufficiently sensitive or specific to identify current unhealthy alcohol use. (See "Clinical manifestations and diagnosis of alcohol-associated fatty liver disease and cirrhosis", section on 'Physical examination findings'.)

- Hepatic impairment, damage, or altered medication metabolism is suggested by abnormal international normalized ratio (INR), albumin, aspartate aminotransferase (AST), and/or alanine aminotransferase (ALT) values. Enzymes including the gamma-glutamyl transferase can provide information suggestive of recent excessive alcohol consumption. Regardless, patients with significant alcohol consumption may have impairment of INR and liver enzymes causing potential perioperative bleeding problems or drug interactions. In particular, reduced hepatic metabolism that may complicate perioperative anesthetic and analgesic management.

All patients with known or suspected unhealthy alcohol use, particularly those with recent and frequent heavy drinking, should be systematically assessed for signs/symptoms of alcohol withdrawal syndrome using a validated instrument such as the Clinical Institute Withdrawal Assessment for Alcohol, revised (table 2) [41]. The clinical presentation of withdrawal is summarized above and is discussed in more detail separately, as is the differential diagnosis of

alcohol withdrawal. (See 'Alcohol withdrawal syndrome' above and "Management of moderate and severe alcohol withdrawal syndromes".)

To facilitate patient education and treatment, patients should receive a DSM-5 diagnostic evaluation for alcohol use disorder. The psychiatric diagnoses in DSM-IV-TR, alcohol abuse and alcohol dependence, were replaced by one diagnosis, alcohol use disorder, in DSM-5. Although the crosswalk between DSM-IV and DSM-5 disorders is imprecise, alcohol dependence is approximately comparable to the moderate to severe subtype of alcohol use. Alcohol abuse is comparable to a mild alcohol use disorder. (See "Risky drinking and alcohol use disorder: Epidemiology, clinical features, adverse consequences, screening, and assessment", section on 'Diagnosis'.)

MANAGEMENT

Perioperative management of patients with unhealthy alcohol use involves close monitoring and prompt intervention to:

- Reduce alcohol use both during the perioperative period and beyond
- Prevent or detect and treat alcohol withdrawal
- Anticipate and manage perioperative complications of alcohol use

Preoperative

Treatment of alcohol use disorder — We suggest that patients with unhealthy alcohol use whose need for surgery is not urgent receive education about alcohol-associated risks and alcohol use disorder treatment with a goal of abstinence prior to surgery. There is some evidence of benefits to this approach. A randomized trial of 42 patients with daily heavy drinking compared alcohol use disorder treatment (800 mg of disulfiram twice weekly to achieve and maintain abstinence) with no treatment one month before surgery [23]. Abstinence was associated with fewer postoperative complications.

Alcohol use disorder treatment can begin with medically supervised withdrawal or prophylaxis, if needed, and typically includes addiction counseling and mutual help group participation; it may include other psychosocial interventions and/or medication. Brief intervention is an option for patients without moderate to severe alcohol use disorder and as an initial approach for anyone with unhealthy alcohol use. (See 'Preventing/treating withdrawal' below and "Alcohol use disorder: Psychosocial management" and "Alcohol use disorder: Pharmacologic management" and "Brief intervention for unhealthy alcohol and other drug use: Efficacy, adverse effects, and administration".)

Although naltrexone, an opioid antagonist, is a mainstay of alcohol use disorder pharmacotherapy, it is not typically used in the perioperative period because it essentially precludes or complicates the use of opioids for perioperative pain. As a result, acamprosate and disulfiram are better choices for treating alcohol use disorder preoperatively, although evidence for this approach is lacking. Patients in the perioperative period are typically in controlled environments where alcohol is not available. (See 'Preventing/treating withdrawal' below and "Alcohol use disorder: Pharmacologic management" and "Alcohol use disorder: Psychosocial management".)

Brief interventions have been found to be effective for patients with unhealthy alcohol consumption without moderate to severe alcohol use disorder, though research to date does not show clear evidence of effectiveness in hospital inpatients [42-46] or preoperative surgical patients [47]. As an example, in a clinical trial, 3139 patients scheduled to undergo elective inpatient surgery were screened to identify 136 patients with unhealthy alcohol use; they were randomly assigned to receive a customized brief intervention or to a control condition [47]. At six months' follow-up assessment both groups experienced a reduction in drinking; they did not differ in the amount consumed or in postoperative complications. (See "Brief intervention for unhealthy alcohol and other drug use: Efficacy, adverse effects, and administration".)

For patients with unhealthy alcohol use who refuse preoperative alcohol use disorder treatment or whose urgent need for surgery precludes treatment, the perioperative period typically involves contacts with several clinicians, providing an important opportunity for patient education and encouraging the patient to transition to alcohol use disorder treatment following surgery. The patient's need for surgery can be a powerful motivator for modifying behaviors that may have contributed to health consequences.

Preoperative consultation with a healthcare provider with addiction expertise (eg, addiction psychiatrist, addiction medicine clinician) may be useful, depending on the treating physician's knowledge and experience treating alcohol use disorder and alcohol withdrawal syndrome. The consultant would interview the patient, identify the presence and extent of unhealthy alcohol use, determine risk of withdrawal, develop a plan with the patient to minimize alcohol-related surgical morbidity, and review treatment options. Frequent contact with the specialist and the patient in the perioperative period may enhance outcomes (eg, length of stay, use of benzodiazepines), but further research in this area is warranted.

Preventing/treating withdrawal — Patients with recent history of known or suspected frequent heavy alcohol use require ongoing monitoring for symptoms of alcohol withdrawal and treatment, if present, with a cross-tolerant medication. Patients with risky alcohol use but no recent frequent heavy use and those without physiological dependence do not need

supervised withdrawal or prophylaxis prior to alcohol use disorder treatment. (See 'Alcohol withdrawal syndrome' above.)

Benzodiazepines are the mainstay of treatment for alcohol withdrawal and may be used to prevent alcohol withdrawal syndrome. Benzodiazepines have been found to reduce the severity of withdrawal symptoms and incidence of delirium and seizures more effectively and safely than other agents [48,49]. We recommend that alcohol not be used to treat symptoms of alcohol withdrawal syndrome. Study of alcohol for this purpose has been limited; it is difficult to titrate, has been associated with surgical and medical complications (eg, anemia and hepatic enzyme elevations) and end-organ effects, and is less efficacious compared with benzodiazepines [50]. Beyond benzodiazepines, there exists other pharmacologic treatments of alcohol withdrawal syndrome, but at the time of this writing, they are the preferred agent, particularly in controlled inpatient environments. (See "Management of moderate and severe alcohol withdrawal syndromes", section on 'Alternative and contraindicated agents'.)

Monitoring — Patients with known or suspected frequent or heavy alcohol use need ongoing monitoring to detect the emergence of signs and symptoms of withdrawal. Use of a validated instrument such as the Clinical Institute Withdrawal Assessment for Alcohol, revised, a measure of withdrawal severity, is suggested (table 2) [41].

Identifying alcohol withdrawal accurately in patients during or following surgery can be challenging, and often assessment using validated instruments of alcohol withdrawal syndrome are imprecise. As an example, patients may not be able to communicate, and other perioperative signs and symptoms (eg, tremulousness, fever/sweat) may impart a falsely high reading on the withdrawal instrument. Administration of withdrawal instruments in the postoperative period may be complicated by endotracheal intubation, decreased level of consciousness, or inability to communicate with the assessor [51]. (See "Management of moderate and severe alcohol withdrawal syndromes".)

The presentation of alcohol withdrawal can be similar to manifestations of the stress responses; difficulty differentiating between the two syndromes can delay time to recognition of withdrawal, increasing the morbidity of patients with physiologic dependence on alcohol. The preoperative evaluation for potential unhealthy alcohol use and potential for alcohol withdrawal syndrome may inform the differentiation. In patients with suspected (but uncertain) unhealthy alcohol use, the clinician can provide alcohol withdrawal syndrome prophylaxis and low-dose alcohol withdrawal syndrome pharmacotherapy while monitoring physical signs and their response to treatment until the patient is able to communicate.

Emerging alcohol withdrawal syndrome symptoms days after the surgery may tip the clinician to institute full alcohol withdrawal syndrome treatment. In all patients with alcohol withdrawal syndrome symptoms postoperatively who are unable or unwilling to be assessed for their preoperative alcohol consumption, preoperative unhealthy alcohol consumption and alcohol withdrawal syndrome should be considered. As an example, postoperative delirium is common and can present similarly regardless of whether due to alcohol withdrawal or other causes (table 3) [52]. The clinician must consider a differential diagnosis that includes cardiovascular, endocrine, infectious, metabolic, neurologic, oncologic, psychiatric, pulmonary, and medication-related causes.

Because patients with unhealthy alcohol use may be at risk for or have medical and mental health conditions associated with their use, these conditions could be exacerbated in the postoperative period. (See 'Alcohol-related complications' above.)

Medically supervised withdrawal — Patients experiencing alcohol withdrawal syndrome prior to surgery need to undergo medically supervised alcohol withdrawal. Treatment with a benzodiazepine is administered when withdrawal symptoms occur. Dosing is based on the severity of symptoms. Supervised alcohol withdrawal is discussed in greater detail separately. (See "Management of moderate and severe alcohol withdrawal syndromes".)

For severe alcohol withdrawal syndrome and delirium tremens, a preferred regimen is to give diazepam 5 to 10 mg IV for moderate to severe symptoms, repeated every 5 to 10 minutes until symptoms are controlled. Lorazepam may also be used (2 to 4 mg IV, repeated every 15 to 20 minutes). Lorazepam, chlordiazepoxide or oral diazepam should be used for milder cases. The choice of oral versus parenteral medication depends in large part on ability to take oral medication. The dosing of benzodiazepines in medically supervised alcohol withdrawal should be guided by using a validated assessment tool, such as the Clinical Institute Withdrawal Assessment for Alcohol, revised (table 2). This requires formally assessing patients at regular intervals. (See "Management of moderate and severe alcohol withdrawal syndromes", section on 'Symptom control and supportive care'.)

Prophylaxis — Benzodiazepines can alternatively be administered prophylactically to prevent alcohol withdrawal syndrome in presurgical patients. In benzodiazepine prophylaxis, the medication is given to asymptomatic, at-risk patients to prevent withdrawal symptoms. This may also be beneficial for patients whose preoperative alcohol consumption is not known. In this case, a long-acting, low-dose benzodiazepine can be used. (See "Management of moderate and severe alcohol withdrawal syndromes", section on 'Prophylaxis'.)

Prophylaxis should be considered to any patient suspected of frequent heavy alcohol use. This is particularly important in such patients whose alcohol consumption is not known because of perioperative pain, sedation, or intubation. In these cases, it is important to ask family and/or friends about the patient's consumption as well as to be attentive to alcohol withdrawal syndrome symptomatology that may develop. (See "Risky drinking and alcohol use disorder: Epidemiology, clinical features, adverse consequences, screening, and assessment", section on 'Diagnosis'.)

Prophylaxis should begin upon cessation of alcohol consumption or admission to the hospital. Delaying until the postoperative period places the patient at risk of developing withdrawal during surgery, when perioperative stress is at its peak. We favor the use of chlordiazepoxide, 25 to 100 mg given every six hours for one day, followed by 25 to 50 mg every six hours for an additional two days. Diazepam 2.5 to 10 mg and lorazepam 0.5 to 2 mg are a reasonable alternative. Patients continue to be monitored and treated for breakthrough withdrawal symptoms as described above. (See 'Monitoring' above and 'Medically supervised withdrawal' above and "Management of moderate and severe alcohol withdrawal syndromes".)

Clinical trials have not evaluated the effect on surgical outcomes of benzodiazepine prophylaxis for alcohol withdrawal. In our clinical experience, preoperative treatment reduces the risk of alcohol withdrawal and may reduce operative morbidity or mortality secondary to alcohol-related complications.

Intraoperative — Close attention to adequate hemostasis and effects of unhealthy alcohol use on anesthesia, analgesia, and surgical stress during surgery may prevent the development of complications and improve postsurgical outcomes. (See "Overview of hemostasis" and 'Intraoperative issues' above.)

Postoperative

Agitation — Agitation due to alcohol withdrawal may be wrongly attributed to postoperative pain, use of restraints, medications, or continued pulmonary intubation. The preoperative assessment of alcohol consumption and the time of last drink, and the use (or lack of use) of pre- or intraoperative withdrawal prophylaxis can assist in determining the role of withdrawal in a patient's agitation. (See 'Screening and initial assessment' above.)

Other — To prevent stress-induced Wernicke-Korsakoff syndrome, patients with alcohol use disorder should receive daily multivitamins and thiamine (100 mg, oral or parenteral) during the preoperative and perioperative periods. (See "Wernicke encephalopathy".)

SOCIETY GUIDELINE LINKS

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "Society guideline links: Alcohol use disorders and withdrawal".)

SUMMARY AND RECOMMENDATIONS

- Patients with unhealthy alcohol use (risky alcohol consumption and alcohol use disorder) face multiple risks in the perioperative period. (See 'Terminology' above and 'Alcohol-related complications' above.)
  - Patients with risky alcohol use, who consume amounts that increase the likelihood of health consequences, face risks associated with increased medical or psychiatric and perioperative consequences. They can also experience alcohol withdrawal syndrome in the absence of alcohol use disorder diagnoses.
  - Patients with frequent heavy alcohol use (including those with a moderate to severe alcohol use disorder) face these risks along with the additional risk of physiologic dependence and withdrawal.
- All preoperative patients should be assessed for quantity, frequency, and recency of alcohol use, and screened (eg, with the Alcohol Use Disorders Identification Test-Consumption [AUDIT-C]) for risky use and frequent heavy use. Laboratory studies and surrogate interviews can provide additional information, particularly for patients who are unable to participate in verbal screening. (See 'Screening and initial assessment' above and "Screening for unhealthy use of alcohol and other drugs in primary care".)
- Patients who screen positive for unhealthy alcohol use should be assessed for evidence of complications of alcohol use, such as hepatic impairment and injury, and bone marrow suppression. (See 'Screening and initial assessment' above and "Hematologic complications of alcohol use" and "Clinical manifestations and diagnosis of alcohol-associated fatty liver disease and cirrhosis".)
- Surgical patients should be carefully monitored and frequently assessed throughout the perioperative period to detect alcohol withdrawal symptoms, signs of infection, cerebral complications, hematological and metabolic complications, and cardiovascular episodes.

(See 'Monitoring' above and "Management of moderate and severe alcohol withdrawal syndromes".)

- We suggest that patients whose need for surgery is not urgent be treated for unhealthy alcohol use prior to rather than subsequent to surgery (**Grade 2B**). Achieving and maintaining abstinence in advance of surgery avoids many of the perioperative complications associated with prophylactically treated withdrawal. (See 'Treatment of alcohol use disorder' above and "Brief intervention for unhealthy alcohol and other drug use: Efficacy, adverse effects, and administration" and "Management of moderate and severe alcohol withdrawal syndromes" and "Alcohol use disorder: Pharmacologic management" and "Alcohol use disorder: Psychosocial management".)

- Patients in alcohol withdrawal typically require observation and treatment with benzodiazepines. The dosing of benzodiazepines in medically supervised alcohol withdrawal should be guided by using a validated assessment tool, such as the Clinical Institute Withdrawal Assessment for Alcohol, revised (table 2). (See "Management of moderate and severe alcohol withdrawal syndromes", section on 'Symptom-triggered therapy' and 'Preventing/treating withdrawal' above.)

- For patients with known or suspected frequent heavy drinking who are not motivated to cease or reduce alcohol use and have not yet experienced withdrawal symptoms, we suggest prophylactic treatment with a benzodiazepine to prevent withdrawal symptoms rather than observation only and/or other treatment strategies (**Grade 2C**). (See 'Prophylaxis' above.)

- Patients with unhealthy alcohol use should receive daily multivitamins and thiamine (100 mg, oral or parenteral) to prevent stress-induced Wernicke-Korsakoff syndrome. (See 'Other' above and "Wernicke encephalopathy".)

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