TERMINOLOGY

CLINICAL CLARIFICATION

- Alcohol use disorder is a problematic pattern of compulsive and uncontrolled alcohol use associated with clinically significant impairment or distress as defined by ***DSM-5*** criteria[1]
- Disease is often heritable, chronic, and progressive[2]
- Presentation is highly variable but is characterized by inability to control drinking, continued drinking despite knowledge of consequences, and neglect of responsibilities[3]

CLASSIFICATION

- Unhealthy alcohol use
  - Overarching term that includes unhealthy alcohol consumption and risky drinking behaviors[4]
    - Estimated prevalence is more than 20% among adults in the United States[5]
  - Risky drinking behaviors
    - Drinking amounts of alcohol that exceed recommended limits and increase risk for health consequences without meeting ***DSM-5*** criteria for alcohol use disorder[5]
      - Maximum recommended limits for men younger than 65 years[5]
        - 4 or fewer standard drinks per day and 14 or fewer per week
      - Maximum recommended limits for women and for men aged 65 years and older[5]
        - 3 or fewer standard drinks per day and 7 or fewer per week
      - ***Standard drink*** equals about 14 g of absolute ethanol; this equates to approximately:[6]
        - 12 oz of 5% ethanol beer
        - 5 oz of 12% ethanol wine
        - 1.5 oz of 80 proof liquor
    - Binge drinking
      - Defined as 5 or more drinks for men and 4 or more drinks for women in a day (or on the same occasion) during the preceding month[1]
      - Pattern of alcohol consumption that results in elevation of blood alcohol concentration to 0.08 g/dL or more within 2 hours[7]
    - Consumption of any amount of alcohol in specific patient populations may be considered risky:
      - Pregnant women
      - Patients with a health condition caused or exacerbated by alcohol (eg, pancreatitis, alcoholic liver disease)
  - Alcohol use disorder
    - Problematic pattern of alcohol use leading to clinically significant impairment or distress as defined by ***DSM-5*** criteria (meeting at least 2 of 11 criteria within a 12-month period)[8]
      - Classified as mild, moderate, or severe based on criteria for condition during the past year[9]
    - Previous iterations of ***Diagnostic and Statistical Manual of Mental Disorders*** (***DSM-III*** and ***DSM-IV***) separated diagnosis of alcohol-related disorders into alcohol abuse and alcohol dependence. This older nomenclature is now out of favor in lieu of current diagnostic terminology: alcohol use disorder with specified severity (mild, moderate, or severe). ***Craving*** was added to the criteria in the newest classification[5]
      - Previous term ***alcohol abuse*** in general correlates with milder alcohol use disorder, whereas ***alcohol dependence*** correlates with more severe alcohol use disorder[3]

DIAGNOSIS

CLINICAL PRESENTATION

- History
  - General
    - Ignorance about and stigma surrounding this disease are barriers to obtaining accurate history
      - Patients may not be forthright with amount and frequency of alcohol consumption; denial and minimization are common
      - Provider must develop a positive and supportive relationship and not show bias
      - History obtained from family and friends may provide a more accurate account of consumption history
    - Clinical presentation is highly variable[2]
  - Course and development of disease
    - First episode of intoxication often occurs in middle teen years[8]
    - Most patients who develop alcohol use disorder do so by their late 20s; about 10% develop the condition after age 40 years[8]

Published December 19, 2018; Updated August 9, 2019

  - Earlier onset of disease is associated with patients who start becoming intoxicated younger and who had conduct problems before they began drinking [8]
  - Disease course is highly variable but often is marked by periods of remission and relapse
    - Characteristic remission and relapse pattern:
      - Stop drinking in response to crisis or serious consequence
      - Resume drinking after a period of abstinence with an initial, brief period of more controlled drinking
      - Rapid escalation in consumption ensues and severe problems again develop
- Typical drinking behavior characteristics and other manifestations based on severity of unhealthy alcohol use [3]
  - Risky drinking behavior
    - Patients often do not regularly drink much above maximum recommended limits
  - Mild alcohol use disorder
    - Patients often drink more heavily than patients with risky drinking behavior but may not drink daily
    - Typical consumption is fewer than 40 drinks per week, and serious withdrawal manifestations are often lacking
  - Moderate alcohol use disorder
    - Patients usually drink daily and may have some withdrawal manifestations when they stop
    - Some do not drink daily but have heavy binge drinking behavior
  - Severe alcohol use disorder
    - Patients are usually daily drinkers who consume more than 40 drinks weekly
    - Significant withdrawal symptoms usually are present, and serious life consequences develop
- Primary manifestations consistent with alcohol use disorder include:
  - Craving phenomenon
    - Patients are unable to reliably stop drinking once they start
  - Obsessions and compulsions surrounding alcohol
    - Strong desire and preoccupation with planning next drinking event, obtaining alcohol, and hiding alcohol, and seeming inability to avoid initiating consumption
    - Patients often report unsuccessful attempts to cut back or quit drinking
  - Tolerance
    - Require increased amounts of alcohol to achieve intoxication or desired effect, or there is diminished effect with continued use of same amount of alcohol
  - Blackouts
    - Manifest as complete or partial amnesia for events during any part of a drinking episode without loss of consciousness and without relative loss of other skill deficits (eg, maintain relative ability to perform other functional skills such as walking, talking, and even driving) [10]
    - Relatively rapid increase in blood alcohol concentration is most consistently associated with increased likelihood of blackout [10]
  - Withdrawal
    - Often one of the last manifestations of disease to appear after other aspects of disease have developed [8]
    - Minor (eg, headache, tremor, insomnia, nausea, vomiting, anxiety) or major (eg, hallucinations, seizure, delirium tremens) withdrawal symptoms may be reported with diminished alcohol use or abstinence
    - Symptoms may be relieved by drinking alcohol (eg, early morning or afternoon alcohol consumption) or by taking another drug closely related to alcohol (eg, a benzodiazepine)
- Additional manifestations that often occur secondary to progression of disease
  - Use of alcohol in hazardous situations (eg, driving car, operating machinery, swimming)
  - Life consequences commonly develop; continued consumption of alcohol may occur despite consequences
    - Common consequences
      - Legal (eg, arrests, incarceration) and conduct (eg, violence) problems
      - Relationship strains (eg, marital discord, estrangement from close relatives or friends)
      - Employment, financial, and educational consequences (eg, absences, failure to meet responsibilities, poor performance and productivity, job related accidents, loss of job)
      - Organ changes (eg, liver disease, gastritis, endocrine disturbance, persistent insomnia, and depression)
  - Hopelessness, depression, and anxiety
    - Often accompanied by overarching feelings and emotions such as:
      - Guilt, shame, and remorse secondary to perceived harm caused to self and others while drinking
      - Deep anger and resentment
      - Intense fears
  - Isolation
    - From people (eg, family, friends, colleagues) and from social and/or recreational activities previously enjoyed

Published December 19, 2018; Updated August 9, 2019

- Common personality traits and characteristics in patients with active disorder (occur and/or worsen as a result of the disorder) may include:
  - Negative temperament[11]
  - Disinhibition and impulsivity[11]
  - Manipulativeness[11]
  - Extroversion[12]
  - Neuroticism[12]
- Initially, patients may present with symptoms secondary to complications related to alcohol use disorder, such as:
  - Unexplained primary medical complications (eg, hypertension, pancreatitis, elevated liver function test results, fatty liver)
  - Child born with fetal alcohol syndrome or fetal alcohol spectrum disorder
  - Falls associated with significant injury (eg, extensive bruising, epidural hematoma)
  - Traumatic injury associated with operating machinery or vehicles while intoxicated
  - Traumatic injury associated with violence while intoxicated
  - Mental health problems (eg, depression, anxiety, attempted suicide)
  - Gastrointestinal issues (eg, gastritis with dyspepsia, nausea, bloating)
  - Neurologic problems (eg, gait instability, peripheral neuropathy)
  - Reproductive health issues (eg, recurrent sexually transmitted infections, unplanned pregnancy, erectile dysfunction, menstrual irregularity)
  - Sleep problems (eg, insomnia, sleep apnea)

- Physical examination
  - Initially, patients may present with findings secondary to complications related to alcohol use disorder
    - Elevated blood pressure and/or tachycardia
    - Hepatomegaly, which may indicate alcohol-induced liver disease
    - Epigastric abdominal tenderness, which may indicate pancreatitis or gastritis
    - Decreased testicular size and feminization in men, associated with reduced testosterone levels
    - Evidence of unexplained trauma
  - Patients may present with characteristic signs of alcohol withdrawal syndrome
    - Unsteady gait
    - Fine action tremor
    - Seizures
    - Mild peripheral edema
    - Restlessness
    - Tachycardia or hypertension
  - Patients may present with signs of intoxication
    - Ataxia
    - Nystagmus
    - Slurred speech
    - Inappropriate affect

CAUSES AND RISK FACTORS

- Causes
  - A combination of genetic, physiologic, and environmental factors[8]
- Risk factors and/or associations
  - Age
    - Past year prevalence estimates in the United States for alcohol use disorder:
      - About 5% for 12- to 17-year-old patients[8]
      - Overall, about 8.5% to 14% for adults aged 18 years and older[8,4]
        - Prevalence is highest among young adults aged 18 to 29 years (about 16%), decreases among middle aged patients, and is lowest among patients aged 65 years and older (about 1.5%)
  - Sex
    - Past year prevalence estimates in the United States for alcohol use disorder are higher among men (12.4%) than women (4.9%)[8]
    - Women who drink heavily are more susceptible to some physical peripheral organ consequences (eg, liver disease) than men[13]
      - Higher fat content and differences in total alcohol dehydrogenase levels in women increase organ damage

Published December 19, 2018; Updated August 9, 2019

- Genetics
  - Family history of alcohol use disorder is a strong risk factor for development of disease [14]
    - Disease is often familial; genetic influences account for approximately 40% to 60% of risk variance [15, 8, 16]
    - Risk of disease is 3- to 4-fold higher in close relatives of patients with disease [8]
      - Highest risk occurs in patients with: [8]
        - Greater number of affected relatives
        - Closer genetic relationship with affected relatives
        - Higher severity of disorder in affected relatives
  - Details regarding specific genetic influences are evolving; some known phenotypes influenced by a number of genetic variations impart lower or higher risk for disease [8]
    - Lower risk phenotypes
      - Altered function of aldehyde dehydrogenase
        - Acute alcohol-related skin flush phenomenon
          - ***ALDH2*2 s***ingle nucleotide polymorphism rs671 (Glu504Lys) leads to diminished activity of aldehyde dehydrogenase and impaired alcohol metabolism [16, 2]
          - Carriers of ***ALDH2*2*** allele develop a disulfiramlike reaction (skin flushing, diaphoresis, tachycardia, nausea, vomiting, headache, palpitations) after consuming alcohol [14]
          - Symptoms may lead to diminished future alcohol consumption, thereby protecting against development of alcohol use disorder
          - Usually noted in Asian patients and is rare in Europeans [14]
      - Altered function of alcohol dehydrogenase
        - ***ADH1B*2 s***ingle nucleotide polymorphism rs1229984 (Arg48His) leads to a fast rate of alcohol metabolism [16]
        - Usually noted in Asian patients and leads to protective effect for development of alcohol use disorder [16]
    - Higher vulnerability phenotypes
      - Preexisting schizophrenia or bipolar disorder
      - Low-level sensitivity (low-level response) to alcohol
  - Genetic variations and clinical response to certain medication
    - Single nucleotide polymorphism variant in exon 1 (Asn40Asp) in ***OPRM1*** (μ-opioid receptor gene) is associated with greater positive reinforcing effects of alcohol consumption and greater alcohol craving, in addition to improved clinical response to naltrexone [9, 17]
    - Allele is more prevalent in white and Asian populations [2]
- Ethnicity/race
  - Among 12- to 17-year-old patients in the United States, listed in order of most to least prevalent: [8]
    - Hispanic (about 6% past year prevalence)
    - Native American and Alaskan Native
    - White
    - African American
    - Asian American and Pacific Islander (about 1.6%)
  - Among adults, in order of most to least prevalent: [8]
    - Native American and Alaskan Native (about 12% past year prevalence)
    - White
    - Hispanic and African American
    - Asian American and Pacific Islander (about 4.5%)
- Other risk factors/associations
  - Increased risk of developing disease is associated with:
    - Earlier onset of first alcohol use and/or intoxication [14, 16]
    - Increased frequency of binge drinking [14, 1]
    - Higher number of years of heavy drinking and number of drinks per day [16]
    - Accepting cultural attitudes toward drinking and intoxication [8]
    - Easy availability of alcohol [8]
    - Low self-control and impulsivity [14]
    - Increased stress levels and suboptimal methods of coping with stress [8]
    - Positive personal experiences with alcohol use and exaggerated positive expectations of alcohol effects [8]
    - Association with peers who use alcohol and other mood-altering substances [8, 14]
    - Childhood conduct and mood disorders [14]
    - Childhood and adolescent stressors (eg, verbal, physical, sexual abuse) and household instability (eg, parent or intimate partner violence, parental psychiatric illness and substance use, household member incarceration) [1, 16]

Published December 19, 2018; Updated August 9, 2019

- Low parental monitoring and poor family support[14]
- Additional associations include:
  - High rates of other concomitant mental health disorders such as another substance use disorder, depression and mood disorders, anxiety disorders, schizophrenia, bipolar disorder, and posttraumatic stress disorder[3]
    - Up to 50% of patients with a lifetime history of alcohol use disorder have a least 1 other mental health disorder[14]
    - Most patients have an additional substance use disorder: at least one-half smoke tobacco and one-third have another drug use disorder[14]
    - Conduct disorder and antisocial behavior often co-occur in adolescents with alcohol use disorder[8]
  - High rates of challenging psychosocial issues such as intimate partner violence, unstable housing, and poverty[3]
  - High rates of concomitant chronic diseases
  - Marital status is associated with rate of alcohol use disorder:[1]
    - Never married: highest association
    - Separated, divorced, or widowed: second highest association
    - Married or cohabitating: lowest association
  - Higher levels of impulsivity are associated with more severe and earlier onset of disease[8]
  - Rates may be higher in lesbian, gay, and bisexual populations[18]

DIAGNOSTIC PROCEDURES

- Primary diagnostic tools
  - Suspect diagnosis based on clinical presentation or positive response to screening tool
  - Conduct secondary assessments to confirm screening results, determine type of unhealthy alcohol use (eg, risky drinking, alcohol use disorder), establish baseline behavior, and identify particular concerns for further discussion during treatment phase[5]
    - May use a second tier screening tool (eg, AUDIT full version [Alcohol Use Disorders Identification Test]) to follow initial positive first tier screen (eg, single question, AUDIT-C [Alcohol Use Disorders Identification Test–Consumption]). AUDIT score can then help guide further assessment and subsequent plan[5]
    - Alternately, National Institute on Alcohol Abuse and Alcoholism's checklist may help guide further assessment with a systematic evaluation for maladaptive patterns of alcohol resulting in clinically significant impairment or distress[19, 20]
  - Confirm alcohol use disorder with a diagnostic interview to establish *DSM-5* criteria[8]
  - Baseline and adjunct studies obtained at time of diagnosis are nondiagnostic but may confirm heavy drinking and identify alcohol-related peripheral organ damage; tests to consider include:[21]
    - Baseline renal function testing, serum glucose level, liver function testing, and CBC on all patients to assess for potential alcohol-related complications[3, 14]
    - Pregnancy test in women of childbearing years[21]
    - Some sources recommend urine toxicology screen to assess for other substances that may affect treatment approach[21]
    - Adjunct tests and findings that may be helpful during evaluation include:
      - Blood alcohol concentration may help in assessing tolerance and recent alcohol consumption[8]
      - γ-glutamyltransferase and carbohydrate-deficient transferrin levels may be elevated in heavy drinkers; both tests combined improve test characteristics (sensitivity/specificity) compared with either test alone[22]
        - Although combining tests is the most useful, carbohydrate-deficient transferrin is more expensive, so many use γ-glutamyltransferase alone
      - Other test results that may be altered in heavy drinkers include:[8]
        - Elevated triglyceride and HDL-C levels
        - High reference range levels of uric acid
        - Elevated mean corpuscular volume
      - Testing for breath or blood alcohol concentration and alcohol metabolites (eg, ethyl glucuronide, phosphatidylethanol) may be useful in certain monitoring scenarios[21]
- Laboratory
  - Liver function testing
    - Liver function testing can identify consequences of liver injury secondary to heavy drinking[8]
    - AST level is characteristically elevated more than ALT level in patients with alcohol-related hepatocyte damage[3]
    - AST to ALT ratio greater than 2 raises the possibility of alcoholic hepatitis, particularly when each enzyme level is lower than about 400 units/L[23]
    - Use of certain drugs (eg, naltrexone, disulfiram) is cautioned in patients with liver disease[21]
    - AST and ALT elevations usually normalize about 4 weeks after cessation of drinking[14]

Published December 19, 2018; Updated August 9, 2019

- γ-glutamyltransferase
  - Modest elevation or high reference range levels (more than 35 units) are consistent with persistent heavy drinking (8 or more drinks daily on a regular basis)[8]
  - Levels return toward reference range within days to weeks of abstinence from drinking[8]
  - Sensitivity and specificity to identify heavy drinking overall is poor; detects about 20% of heavy drinkers[14]
- Renal function testing
  - Baseline renal function testing can help direct appropriate choice of pharmacotherapy[21]
  - Use of certain drugs (eg, naltrexone, acamprosate) is cautioned in patients with impaired renal function[21]
- Mean corpuscular volume
  - Macrocytosis with elevated or high reference range mean corpuscular volume values may be present in heavy drinkers secondary to direct toxic effects of alcohol on bone marrow erythropoiesis[8]
  - Elevations may persist in times of abstinence for up to 3 months owing to long half-life of erythrocytes[14]
- Blood alcohol concentration
  - Most individuals without tolerance will demonstrate severe signs of intoxication with levels at 200 mg/dL or more[8]
  - Some degree of tolerance likely exists when blood alcohol concentration exceeds 150 mg/dL without signs of intoxication[8]
  - Blood or breath alcohol concentration may be a helpful measured parameter to monitor for abstinence[14]
- Carbohydrate-deficient transferrin
  - Levels of 20 units or higher are consistent with persistent heavy drinking (8 or more drinks daily on a regular basis)[8]
  - Levels return toward reference range within days to weeks of abstinence from drinking[8]
  - Sensitivity is moderate and specificity is high for detection of high-risk drinking; may be helpful parameter to identify heavy drinking[14]
  - Testing is not widely available and usually is performed in specialized laboratories[14]
- Alcohol metabolites
  - Ethyl glucuronide[22]
    - Urine is the most widely used sample for testing
    - Test is highly sensitive; false positives are not infrequent because even trace amounts of alcohol exposure (eg, in cosmetics) can result in positive test[21]
    - False positives can occur from other conditions (eg, bacterial hydrolysis from *Escherichia coli* causing a urinary tract infection)
    - Time for levels to normalize after alcohol consumption is about 2 days[14]
    - Measured parameter may be helpful to monitor for abstinence[14]
    - Testing is not widely available and usually is performed in specialized laboratories[14]
  - Ethyl sulfate[22]
    - Ethyl sulfate and ethyl glucuronide are both products of ethanol metabolism and levels are often measured together in the urine to detect recent ethanol use
    - Unlike ethyl glucuronide, ethyl sulfate occurs in the urine only as a result of alcohol consumption
  - Phosphatidyl ethanol
    - Blood is the most widely used sample for testing
    - Sensitive and specific marker to detect chronic drinking (eg, 3 or more drinks a day for 1-2 weeks); may be helpful parameter to identify heavy drinking[14,21]
    - Marker may be detected for 2 to 4 weeks in blood after drinking has stopped[21]
    - Testing is not widely available and usually is performed in specialized laboratories[14]

Common biologic markers of alcohol use.

Test	Monitor abstinence	Identify high-risk drinking	Time to normalize	Sensitivity	Specificity
Breath or blood alcohol concentration	Yes	No	Hours	Low	High
γ-glutamyltransferase	No	Yes	Up to 4 weeks	Low	Moderate
RBC mean corpuscular volume	No	Yes	3 months	Low	Moderate
AST	No	Yes	4 weeks	Low	Low
Carbohydrate-deficient transferrin	No	Yes	4 weeks	Moderate	High
Ethyl glucuronide	Yes	No	2 days	High	High

Published December 19, 2018; Updated August 9, 2019

Phosphatidyl ethanol	No	Yes	4 weeks	High	High
Ethyl sulfide	Yes	No	2 days	High	High
Test characteristics (sensitivity/specificity) apply to usefulness for detection of high risk drinking.					

Adapted from Connor JP et al: Alcohol use disorders. Lancet. 387(10022):988-98, 2016, Table 2.

- Other diagnostic tools
  - *DSM-5* diagnostic criteria for alcohol use disorder[8]
    - Diagnosis of alcohol use disorder may be assigned based on meeting at least 2 of the following 11 symptom criteria occurring within a 12-month period
    - Symptom criteria include:[8]
      - Alcohol consumed in larger amounts or over a longer period than intended
      - Persistent desire or unsuccessful efforts to cut down or control alcohol use
      - Much time spent in activities necessary to obtain, use, or recover from effects of alcohol
      - Craving, strong desire, or urge to use alcohol
      - Recurrent alcohol use resulting in a failure to fulfill major role obligations at work, school, or home
      - Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by effects of alcohol
      - Important social, occupational, or recreational activities given up or reduced owing to alcohol use
      - Recurrent alcohol use in situations in which it is physically hazardous
      - Continued alcohol use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by alcohol
      - Tolerance, as defined by either of the following:
        - Need for markedly increased amounts of alcohol to achieve intoxication or desired effect
        - Markedly diminished effect with continued use of the same amount of alcohol
      - Withdrawal, as manifested by either of the following:
        - Characteristic signs of alcohol withdrawal syndrome
        - Consuming alcohol or a closely related substance (eg, a benzodiazepine) to relieve or avoid withdrawal symptoms
    - Specifiers[8]
      - Severity
        - Mild: presence of 2 to 3 *DSM-5* symptom criteria
        - Moderate: presence of 4 to 5 *DSM-5* symptom criteria
        - Severe: presence of 6 or more *DSM-5* symptom criteria
      - Remission status
        - Early remission
          - None of the criteria previously met for alcohol use disorder are present for at least 3 months but less than 12 months (except for craving phenomenon, which may still be present)
        - Sustained remission
          - None of the criteria previously met for alcohol use disorder are present at any time for a period of 12 months or longer (except for craving phenomenon, which may still be present)
      - Presence in a controlled environment
        - Specify if patient is in a controlled environment (eg, locked hospital unit, therapeutic community, correctional facility) where access to alcohol is restricted

DIFFERENTIAL DIAGNOSIS

- Most common
  - Nonpathologic use of alcohol
    - Similar presentation, with repeated (sometimes daily) and occasionally heavy use of alcohol in quantities sufficient to cause intoxication[8]
    - As opposed to patients with alcohol use disorder, use does not result in repeated and significant distress or impaired functioning in these people[8]
    - Differentiate clinically with *DSM-5* criteria
  - Sedative, anxiolytic, or hypnotic use disorder
    - Presenting signs and symptoms are nearly identical to manifestations of alcohol use disorder
    - Concurrent use of sedative, anxiolytic, or hypnotic medications is not uncommon in patients with alcohol use disorder
    - As opposed to alcohol use disorder, mild decrease in autonomic system functioning (eg, bradycardia, hypotension) is more characteristic of sedative, anxiolytic, or hypnotic use

Published December 19, 2018; Updated August 9, 2019

- Differentiation can be difficult and disorders may be comorbid. Clinical history, urine drug testing, and application of *DSM-5* criteria can aid in differentiation
- Depressive and anxiety disorders
  - May present similar to alcohol use disorder with mood changes in conjunction with heavy or frequent alcohol use
  - People with mental health conditions may self-medicate with alcohol in effort to blunt severity of psychiatric symptom manifestations
  - Alcohol-induced depression and anxiety are common in patients with active alcohol use disorder and initially can complicate the differentiation process
  - True comorbid psychiatric illnesses, rather than alcohol-induced effects, are often noted before onset of heavy alcohol use and persist after recovery from alcohol use disorder is achieved [3]
  - Diagnosis of comorbid depressive and anxiety disorders may require a period of abstinence to determine whether manifestations are secondary to alcohol-induced effects, primary mental health issue, or both
  - Diagnoses are based on *DSM-5* criteria

TREATMENT

GOALS

- Start individualized treatment approach with goal of abstinence from alcohol consumption
- Reduce or eliminate complications associated with the disorder, and improve or restore health and social well-being of patient
- Monitor and provide follow-up in effort to prevent relapse

DISPOSITION

- Admission criteria
  - Admit patients with moderate to severe withdrawal and those who are at risk for severe withdrawal (eg, history of severe withdrawal, withdrawal seizures) for inpatient detoxification [3]
  - Admit patients with significant medical or psychiatric comorbidity, patients who lack social support, and patients who are pregnant for further evaluation and management [3]
  - Admit patients at risk for suicide for further evaluation and treatment
  - Admit any heavily intoxicated patients who cannot be cleared in the emergency department after period of observation for airway protection, hydration, seizure precautions, and monitoring for glucose abnormalities, ketoacidosis, potential trauma, and development of withdrawal [14]
  - Patients with serious health consequences related to alcohol use (eg, significant trauma, cardiac complications, liver failure, pancreatitis, pneumonia) may require admission for further diagnostic and management considerations
  - Criteria for ICU admission
    - Alcohol use disorder does not generally require ICU level of care; however, patients with severe withdrawal manifestations or complications related to extreme intoxication may require ICU admission
- Recommendations for specialist referral
  - Consider evaluation and treatment in consultation with an addiction medicine specialist for patients at risk for severe withdrawal course, moderate to severe alcohol use disorder, and inability to maintain sobriety secondary to frequent relapse
  - Psychiatric evaluation is required for patients at risk for suicide (eg, ideations with plan, ideations with past attempt) and patients with likely psychiatric comorbidity
  - Pregnant patients require care in consultation with high-risk obstetrician and may require evaluation and management by an addiction medicine specialist
  - Consider evaluation and treatment in consultation with an adolescent addiction medicine clinician for adolescent patients
  - Consult appropriate specialist for patients presenting with serious health consequences related to alcohol use (eg, gastroenterologist for liver failure, cardiologist for cardiomyopathy)

TREATMENT OPTIONS

- Treatment of alcohol use disorder
  - Brief behavioral intervention is the initial step to define and formulate a treatment plan. Indicated for all patients with unhealthy alcohol use [14]
    - Variations in content and intensity of intervention exist. Most interventions involve 1 to 3 sessions lasting 5- to 20-minutes to educate regarding safe consumption levels, set drinking goals, and provide strategies to lower intake [14]
    - Clinical approach protocol is available on the National Institute on Alcohol Abuse and Alcoholism website [24]
    - Intervention can be effective in reducing hazardous drinking and in encouraging patients with alcohol use disorder to engage in treatment [14]
  - Several treatment options are available; no single approach has proven superior to another [5, 25]
    - Medically managed withdrawal and detoxification when indicated [5]

Published December 19, 2018; Updated August 9, 2019

- Most treatment is currently delivered in specialty settings; however, treatment is increasingly available and effective from a primary care setting. Treatment via primary care generally requires coordination with behavioral/mental health services[5]
- Options for treatment settings include inpatient care, residential treatment, intensive outpatient programs, and outpatient care[5]
  - Structured residential treatment in a therapeutic community or rehabilitation program may be required for patients with greater challenges (eg, more severe alcohol use disorder, little social support, unstable living conditions) and those who are unresponsive to outpatient treatment
- Aftercare program is often a valuable adjunct to follow inpatient, residential, and intensive outpatient programs[5]

- Various treatment modalities are complementary; no single approach is universally successful or appeals to all patients
  - Ultimate treatment target of sustained abstinence from alcohol consumption is associated with best overall outcomes[26, 14, 11, 5, 9, 27]
  - Important overarching principle of treatment is to engage patient in 1 or more psychological and/or pharmacologic treatment approaches rather than advocate for a specific treatment[14]
  - Most commonly recommended treatment is multimodal; ideal approach includes an individualized combination of psychiatric and/or psychosocial rehabilitation and pharmacotherapy[9]
    - Common psychological and psychosocial treatment approaches include:
      - Mutual help groups
        - Used to address the psychosocial aspect of alcohol use disorder[28]
      - Brief counseling sessions
        - Used to affect behavior: encourage abstinence, adherence to medication regimen, and participation in mutual help groups[21]
      - Intensive psychological counseling
        - Used to address psychological aspects of alcohol use disorder; required particularly in those with co-occurring mental health disorders[26]
    - Pharmacotherapy
      - Used to address the neurobiologic aspect of alcohol use disorder[26]
      - Medications are usually recommended after successful cessation of alcohol use to improve ability to maintain abstinence and to enhance intensive psychological counseling[5]
        - Best outcomes for patients prescribed medications occur in those who are able to abstain from consuming alcohol (even for a few days) before starting pharmacotherapy[26]
      - Indications for pharmacotherapy
        - Consider for all patients with active alcohol use disorder[9, 26]
          - Patients with mild disease may benefit from pharmacotherapy, but data are limited[1]
        - Moderate to severe alcohol use disorder[29]
          - Naltrexone or acamprosate is first line therapy. Goal is to reduce consumption or achieve abstinence[30]
          - Disulfiram is for patients who prefer it or are intolerant of or unresponsive to the first line medications. Goal is to achieve abstinence
          - Gabapentin is for patients who prefer it or are intolerant of or unresponsive to other approved medications. Goal is to reduce consumption or achieve abstinence[31]
          - Topiramate can be used, but it has more adverse events than the other choices
        - Patient who has discontinued drinking in the past few months but continues to experience intense cravings, lapses, or relapses[26]
        - Patient who fails to respond to nonpharmacologic treatments approaches alone[26]
      - Pharmacotherapy options
        - Approved medications include disulfiram, acamprosate, and naltrexone (oral and long-acting intramuscular injection)[5]
          - Oral naltrexone and acamprosate appear similarly effective for lapse (return to any drinking) prevention and for reduction of drinking days when compared with placebo[27, 14]
          - Oral naltrexone appears effective for relapse (return to heavy drinking) prevention compared with placebo[27]
          - Number needed to treat ranges from 9 to 20 for lapse and relapse prevention[27, 14]
        - Nonapproved medications with some proven efficacy include topiramate[5] and gabapentin
          - Data supporting topiramate yield small to moderate effect size in promoting abstinence and reducing heavy drinking compared with placebo[9]
          - Limited data indicate substantial effect size in promoting abstinence and reducing heavy drinking compared with placebo[9]

Published December 19, 2018; Updated August 9, 2019

- Duration of pharmacotherapy
  - Optimal duration is not firmly established [9, 26]
  - 3 to 6 months minimum is recommended [1, 26]
  - Treatment continued for 1 year or more is often employed given that risk of relapse is highest in the first year of abstinence [21, 26]
  - Patients may require multiple episodes of pharmacotherapy or indefinite pharmacotherapy [21, 1]
- Choice of medication
  - Data do not support 1 standardized approach to help guide initiation of 1 medication as opposed to another [26]
    - Initial medication choice depends on individual treatment goals, presence or absence of comorbidity, medication adherence considerations, and other historical factors [9]
    - Common considerations include:
      - Disulfiram may be helpful in a clinical scenario involving a highly motivated patient with goal of complete abstinence [9]
      - Naltrexone is ***not*** preferred for patients with chronic pain syndromes who may require opioids [9]
      - Naltrexone may be preferred in patients with concomitant opioid use disorder, intense cravings, or family history of alcohol use disorder [21]
      - Advanced liver disease may limit use of naltrexone [9]
      - Advanced renal disease may limit use of acamprosate
      - Consider using topiramate for patients with preexisting seizure disorder and gabapentin for patients with preexisting neuropathy [9]
  - Consider trial of alternate medication if patient does not respond to first choice of medication [26]
  - No current data support increased efficacy of combination pharmacotherapy; however, data are limited [26, 9]
- Comprehensive resource—***Medication for the Treatment of Alcohol Use Disorder: A Brief Guide***—is available from the Substance Abuse and Mental Health Services Administration [21]

- Most experts suggest administering a multivitamin containing thiamine, folic acid, and pyridoxine
- Multiple treatment resources are listed in Appendix B of the Substance Abuse and Mental Health Services Administration publication, ***Medication for the Treatment of Alcohol Use Disorder: A Brief Guide*** [21]
- Address comorbid psychiatric illnesses, substance use disorders, and behavioral disorders [32]
- Avoid using antidepressants to treat alcohol use disorder unless evidence exists of a co-occurring disorder for which an antidepressant is indicated (eg, anxiety disorder) [29]
- ***Avoid using benzodiazepines,*** except to treat alcohol withdrawal

- Treatment of risky drinking behavior without alcohol use disorder
  - Preferred treatment approach is brief alcohol counseling intervention in the primary care setting with the goal of reducing harm by reducing alcohol consumption [5, 33]
- Drug therapy
  - Naltrexone (oral and long-acting intramuscular injection)
    - Contraindications
      - Acute hepatitis or liver failure; [5] however, drug is safe in patients with mild to moderate liver disease (up to Child-Pugh Class B cirrhosis or transaminases less than 5 times upper limit of reference range) [9]
      - Patients taking opioids or opioid agonists such as buprenorphine (drug precipitates opioid withdrawal) or anticipated need for opioids (drug blocks effects of opioids) [5, 34]
        - Opioid abstinence for several days to a week (about 5 times half-life of opioid taken) is recommended before starting naltrexone [21, 9]
    - Use with caution in patients with moderate to severe renal impairment [21]
    - Most data support best efficacy in patients not currently drinking alcohol (number needed to treat is 12 to prevent return to heavy drinking compared with placebo) [9]
    - Predictors of positive therapeutic response to naltrexone may include positive family history for alcohol use disorder and strong cravings for alcohol [35]
    - Oral dosage
      - Naltrexone Hydrochloride Oral tablet; Adults: 50 mg PO once daily with food for 12 weeks. Other regimens include 50 mg PO once daily on weekdays and 100 mg PO on Saturdays; 100 mg PO every other day; or 150 mg PO every third day. Some patients may require 100 mg/day PO. Initially, patients may require 3 to 6 months of treatment. Certain patients may benefit from up to 1 year of treatment. Titrate dose from 12.5 mg to 25 mg PO once daily to minimize GI upset; gradually titrate the dose, split the daily dose, or adjust the administration times.

Published December 19, 2018; Updated August 9, 2019

- Intramuscular injection dosage
  - Naltrexone Suspension for injection, Extended Release; Adults: 380 mg IM every 4 weeks. Use is indicated in patients who are able to abstain from alcohol in an outpatient setting prior to treatment initiation. Patients should not be actively drinking alcohol at the time of initial naltrexone IM administration.
- Acamprosate
  - Precaution: dose reduction required for patients with moderate renal impairment (use 333 mg dose PO 3 times a day) and low body weight (less than 65 kg [14]) [21, 5]
  - Contraindicated in patients with severe renal impairment [5, 34]
  - Safe to use in patients with mild to moderate liver disease (Child-Pugh class A or B cirrhosis) [9]
  - May be most effective in patients not currently drinking alcohol; effective for both maintaining abstinence and reducing heavy drinking days (number needed to treat is 12 to prevent return to drinking compared with placebo) [9]
  - Acamprosate Calcium Gastro-resistant tablet; Adults: 666 mg PO three times per day. Initiate treatment as soon as possible after the period of alcohol withdrawal, when abstinence is achieved, and maintain treatment even if the patient relapses. Lower doses may be effective in some patients. Efficacy in promoting abstinence has not been demonstrated in patients who have not undergone detoxification or achieved alcohol abstinence; therefore, acamprosate is indicated only in patients who are abstinent at the time of treatment initiation. Acamprosate should be used as a part of a comprehensive program that includes psychosocial support and treatment.
- Disulfiram
  - Precautions: causes symptoms with alcohol exposure (eg, flushing, headache, nausea and vomiting, diaphoresis, lightheadedness); may cause medically dangerous symptoms with significant alcohol exposure (eg, hemodynamic instability) [9, 5]
    - Avoid using other products with potential for significant alcohol absorption (eg, alcohol-based shaving creams, mouthwash, cough syrup) [9]
  - There is potential for drug interactions with disulfiram use (eg, benzodiazepines, isoniazid, rifampin, metronidazole, warfarin, oral hypoglycemics, phenytoin, theophylline) [21]
  - Contraindicated in patients who plan to continue consuming alcohol; have severe cardiac disease, psychosis, or cognitive dysfunction; are pregnant or breastfeeding; or are highly impulsive [34, 29, 32]
    - Cardiac function assessment may be indicated before initiating treatment with disulfiram, depending on patient's history [29]
  - Effectiveness is improved when patient dosage is monitored. Best reserved for highly motivated patients and patients with significant external pressure to maintain sobriety with goal of abstinence [26, 9]
  - First dose may be given after 12 hours of confirmed alcohol cessation [21, 9, 5]
  - Disulfiram Oral tablet; Adults: 500 mg PO once daily every morning for 1 to 2 weeks, then reduce to 250 mg PO once daily. The dose may be taken in the evening if drowsiness occurs. Recommended maintenance dosage range: 125 mg to 500 mg PO once daily. Max: 500 mg/day PO.
- Topiramate
  - Consider for patients with comorbid seizure disorder [9]
  - Precaution: titrate dose escalation more slowly and diminish total daily dose by 50% in patients with creatinine clearance of less than 70 mL/min; taper is required when medication is discontinued [9]
  - Initiate with gradual dose escalation over 4 weeks [9]
  - Topiramate Oral tablet; Adults: Use not FDA-approved, but has been studied. Initially, 25 mg/day PO (usually given at bedtime), then titrate slowly. Max: 300 mg/day PO in divided doses.
- Gabapentin
  - Consider for patients with comorbid neuropathy [9]
  - Precaution: potential for drug misuse may be a concern given recent accounts of gabapentin overdose, addiction, and diversion [9]
  - Gabapentin Oral tablet; Adults: Use not FDA-approved, but has been studied. Initially, 300 mg PO at bedtime on day 1; then 300 mg PO twice daily on day 2; then 300 mg PO 3 times per day on Day 3; and then titrated upward over days 4 to 7 to reach final dosage. Doses from 600 mg/day to 1,800 mg/day PO have improved abstinence rates and relapse-related symptoms (i.e., insomnia, dysphoria, craving) in some patients.

- Nondrug and supportive care
  - Alcohol use disorder
    - Brief intervention defines problem and formulates treatment plan; steps for initial brief intervention:
      - Clearly state diagnosis [24]
      - Negotiate a realistic drinking goal with abstinence being the safest option [24]
      - Recommend treatment plan, which involves counseling and/or medication with or without medically assisted withdrawal management [24]
      - Motivate patient to engage in decision making about medication and treatment plan [14]

Published December 19, 2018; Updated August 9, 2019

- Abstinence is the ultimate goal for optimal outcome [26]
  - Abstinence is not the initial expressed goal of many patients [9, 14]
    - When a patient with alcohol use disorder initially is unwilling to commit to abstinence, best approach is to set the goal of reducing drinking, while continuing to reinforce that a goal of abstinence has best outcome [26]
    - Alternate outcome goals, at least initially, can include reducing cravings, quantity consumed, and number of heavy drinking days [9]
    - Need for abstinence is suggested by failure to control drinking [14]
  - Some slightly different initial approach models for patients unable to or unwilling to abstain: [5]
    - Shared decision-making model
      - Support patient as preferences, values, and goals are clarified
    - Harm reduction model
      - Controversial approach involves main treatment goal of reducing heavy drinking (controlled drinking) rather than complete abstinence
  - Provide suggestions for strategies to help maintain abstinence and cope with urge obsessions [32]
- Psychiatric and psychosocial rehabilitation
  - Modalities
    - Intensive counseling programs
      - May occur in a variety of settings (eg, inpatient, outpatient) and with a number of approaches (eg, individual, group) [5]
      - Most commonly recommended techniques include motivational enhancement therapy and cognitive behavioral therapy [5]
    - Brief counseling sessions
      - May occur in primary care setting; motivational interviewing technique is often employed [33]
      - Weekly or biweekly, brief (15-20 minutes), and may be effective when combined with medication use [21]
    - Mutual help groups
      - Mutual help groups can help maintain long-term sobriety and improve quality of life in patients who attend regularly and actively participate in discussion [21, 32]
      - Most commonly recommended programs include 12-step–based programs such as Alcoholics Anonymous; meetings can be located through the Alcoholics Anonymous website [36] and local resources [5, 36]
      - SMART Recovery [37] (Self-Management and Recovery Training) is an alternative for patients who reject the spiritual recovery angle offered by most Alcoholics Anonymous programs [14]
  - Substance Abuse and Mental Health Services Administration provides a Behavioral Health Treatment Services Locator [38] to help find addiction and mental health services throughout the United States
- Relapse prevention
  - Involves frequent monitoring and follow-up
  - Goals include maintaining high motivation and accountability for treatment, promoting and maintaining positive attitudes toward recovery, and diminishing risk for relapse [23]
- Adjustments to treatment plan
  - Depend on patient progress, specific pitfalls encountered (eg, problems adhering to treatment plan, medication tolerance), and evolving treatment goals
  - In the event of relapse, consider the following treatment options [21]
    - Assess and address social, medical, or behavioral factors that contribute to patient's alcohol consumption
    - Increase monitoring
    - Adjust medication dose
    - Increase or change intensity of psychosocial services
    - Refer patient for specialty care to addiction medicine specialist, if not already done

- Treatment of risky drinking behavior without alcohol use disorder
  - Behavioral counseling interventions may reduce or eliminate behavior [5]
  - Data support brief (5-15 minutes) multicontact (2 or more) intervention as the most effective approach [5]
    - Clinical approach protocol is available on the National Institute on Alcohol Abuse and Alcoholism website, and structured questions are available [4, 24, 39]
    - Key components of brief intervention include raising subject, providing feedback, enhancing motivation, negotiating, and advising [39]
  - Effective counseling techniques use motivational interviewing, advising, feedback, alcohol consumption diaries, self-help materials, and problem-solving exercises [5]
    - Motivational interviewing techniques are particularly promising and are designed to guide and facilitate behavioral changes
      - Focus is to elicit patient motivation for change and to aid exploration and resolution of ambivalence

Published December 19, 2018; Updated August 9, 2019

        - Techniques used include reflective listening, open-ended questions, elicit-provide-elicit strategy, asking permission, importance exercises, and confidence exercises. Uses REDS strategy (roll with resistance, express empathy, develop discrepancy, support self-efficacy)
      - Advice regarding strategies to reduce alcohol intake in patients with risky drinking behavior is available [32]
    - Follow-up to review alcohol intake and continue support at each patient visit
  - Procedures
- Comorbidities
  - Psychiatric illnesses and behavioral disorders
    - Mental health conditions (eg, anxiety disorders, depressive disorders, conduct disorders, schizophrenia, bipolar disorder, antisocial personality disorder, substance use disorders, eating disorders, posttraumatic stress disorder) are observed with increased frequency in patients with alcohol use disorder
    - Integrated treatment is the most effective and preferred treatment method; assumes that each disorder is primary and requires simultaneous care [21]
    - Primary caregiver can be most effective coordinating and streamlining care through specialists (eg, psychiatrists, addiction medicine specialists) [21]
    - Both naltrexone and acamprosate may be used in combination with psychiatric medications; disulfiram is contraindicated in the presence of psychosis and may increase tricyclic antidepressant and long-acting hepatically metabolized benzodiazepine levels [21]
    - Treatment of depression is individualized given that substance-induced depression and comorbid chronic depression may be difficult to differentiate [21]
      - Consider antidepressant when
        - Symptoms limit recovery potential and there are limited or no contraindications (eg, history of mania or hypomania) [21]
        - Depressed mood does not improve or resolve with reduction in heavy alcohol use or abstinence [1]
  - Renal impairment [29]
    - Severe renal impairment: acamprosate is contraindicated
    - Mild to moderate renal impairment: acamprosate should not be used as first line treatment
  - Acute hepatitis or hepatic failure [29]
    - Naltrexone is contraindicated
  - Anticipated need for opioids or other opioid requirement [29]
    - Naltrexone is contraindicated
  - Co-occurring opioid use disorder [29]
    - Naltrexone is indicated for patients (whose goal is abstinence from both opioids and alcohol) who are able to abstain from opioid use for a clinically appropriate time before starting naltrexone
  - HIV [39]
    - Ineffective treatment of alcohol use disorder can adversely affect HIV treatment secondary to suboptimal antiretroviral therapy adherence
    - Intramuscular dosing of naltrexone may be preferred to ensure administration and diminish pill burden in patients opting for pharmacotherapy
- Special populations
  - Pregnant women
    - 11.5% of pregnant women report drinking alcohol and 3.9% report binge drinking in the past 30 days, according to data from the Behavioral Risk Factor Surveillance System obtained between 2015 and 2017 [40]
    - Alcohol consumption during pregnancy is associated with fetal alcohol spectrum disorders including birth defects involving the central nervous system, behavioral disorders, and impaired intellectual development
      - May also be a risk factor for other adverse pregnancy outcomes such as miscarriage and stillbirth [40]
    - Strict abstinence from alcohol consumption is the primary goal for pregnant women and women trying to conceive; no amount of alcohol is known to be safe for developing fetus [21]
    - Screening questions and tools require incorporation of assessment for any alcohol use during pregnancy; several adapted screening tools are validated for use in pregnant women
    - Manage patients in consultation with an addiction medicine specialist and/or obstetrician specializing in high-risk pregnancy [21]
    - Medication use in pregnant women is controversial; none of the medications approved for treatment of alcohol use disorder have been definitively shown to be safe for pregnant or nursing women [41, 21]
      - Medications should be used only when probable benefits outweigh potential risks [21]
      - The American Psychiatric Association, the International Task Force of the World Federation of Societies of Biological Psychiatry, and the International Association for Women's Mental Health recommend against use of medications (other than benzodiazepines) to treat alcohol withdrawal in pregnant and breastfeeding women [29, 42]

Published December 19, 2018; Updated August 9, 2019

- Disulfiram is contraindicated in pregnancy[21]
- Low doses of benzodiazepines used for the shortest duration may be used to prevent alcohol withdrawal symptoms if high chronic alcohol intake is ceased (hospitalization is recommended in this scenario)[42]

– Assess newborns for fetal alcohol spectrum disorders and measure alcohol metabolites in meconium if fetal alcohol exposure is suspected[42]

- Adolescents and young adults
  - None of the available medications are approved for use in patients younger than 18 years with alcohol use disorder[41,21]
  - Ideally, refer patients to a clinician or program specializing in adolescent addiction for treatment planning[21]
  - In practice, because medications have no specific contraindications in this population, judicious use of medication may be necessary when psychosocial interventions alone are not effective or when there is evidence of moderate to severe alcohol use disorder[21]
  - Specific screening questions and tools are useful in adolescents; several adapted screening tools are validated for use in this population
- Older adults
  - Several diagnostic challenges exist in this age group. Accurate diagnosis may be difficult owing to:[21]
    - Pronounced patient and family member shame, denial, and minimization regarding disorder
    - Misdiagnosis of alcohol use disorder as another condition common in this age group (eg, depression, dementia)
  - Treating with medications must be done carefully because there is increased likelihood of concomitant comorbidity and diminished renal clearance of medications[21]
    - Acamprosate may require dose reductions and frequent renal function tests
    - Disulfiram requires dose reduction; maintain care when prescribing to patients taking multiple medications because potential exists for multiple drug interactions with disulfiram

MONITORING

- Follow-up monitoring and continued support are ongoing
  - Follow-up frequency is individualized
    - Office visits usually are scheduled weekly during initial phases of treatment then monthly when recovery process is more stabilized[39]
  - Approach depends on patient's ability to meet and maintain drinking goals[24]
    - Patient who is unable to meet and maintain drinking goals
      - Acknowledge that change can be difficult and support patient efforts to diminish consumption
      - Relate drinking to medical and psychosocial problems; in other words, suggest that the patient's medical and psychosocial problems are exacerbated or caused by, not solved by, alcohol use
      - Consider the following measures if they are not already in place
        - Refer to addiction medicine specialist for further recommendations and management
        - Recommend additional counseling (eg, add another form of counseling, increase frequency of mutual help group)
        - Engage family and/or significant other in treatment plan
        - Prescribe or change medication
      - Address coexisting medical and psychiatric disorders as needed
    - Patient who is meeting and maintaining drinking goals
      - Reinforce and support continued adherence to treatment plan
      - Coordinate care with addiction medicine specialist when applicable
      - Review medication plan
      - Treat coexisting nicotine dependence[43]
      - Address coexisting medical and psychiatric disorders as needed
  - Standardized progress notes are available on the National Institute on Alcohol Abuse and Alcoholism website[26]
  - Substance Abuse and Mental Health Services Administration has resources to help with monitoring health status and social functioning[21]
  - Monitoring parameters depend on initial findings and patient progress, and may include:[21]
    - Laboratory tests such as AST, γ-glutamyltransferase, carbohydrate-deficient transferrin, blood or breath alcohol, alcohol metabolites, and urine drug screens
    - Standardized questionnaires (eg, Alcohol Urge Questionnaire)[44]
    - Prescription refill monitoring through pharmacy or state prescription monitoring program
    - Periodic reports from family members or other outside support (eg, mutual help group sponsor) with appropriate written consent

Published December 19, 2018; Updated August 9, 2019

- Specific medication-related monitoring
  - Naltrexone
    - Monitor clinically for adverse events such as nausea, hepatotoxicity (rare), and depression; injection site reactions may occur with intramuscular dosing [9]
    - Some sources recommend periodically monitoring liver transaminase levels about every 6 months; discontinue drug if transaminase levels rise above 3 times baseline values [32, 39]
  - Acamprosate
    - Drug is well-tolerated; however, diarrhea is not uncommon [9]
    - Monitor renal function in patients 65 years and older and in patients with decreased renal function (creatinine clearance rate less than 70 mL/minute/1.73 m^2) [21]
    - Clinically monitor for depression, suicidality, and ethanol withdrawal symptoms
  - Disulfiram
    - Monitor for idiosyncratic toxic hepatitis; [9] no rigorously standardized monitoring regimen is established
      - Substance Abuse and Mental Services Administration recommends baseline liver function tests with follow-up 10 to 14 days after starting drug, followed by continued periodic monitoring [21]
    - Monitor clinically for other adverse events, including neuropathy and psychosis [9]
    - Substance Abuse and Mental Health Services Administration suggests periodically monitoring CBC and serum chemistries [21]
  - Topiramate
    - Monitor clinically for adverse events including paresthesias, taste disturbance, cognitive impairment, depression, weight loss, diarrhea, depression, suicidality, and visual disturbances [9]
    - Many experts recommend periodic monitoring for metabolic acidosis by checking serum bicarbonate, electrolyte abnormalities, and ammonia levels to assess for hyperammonemia
    - Consider referring symptomatic patients and those at risk to an ophthalmologist to monitor for acute myopia and secondary angle closure glaucoma
  - Gabapentin
    - Monitor clinically for adverse events including cognitive impairment, fatigue, and ataxia [9]

COMPLICATIONS AND PROGNOSIS

COMPLICATIONS

- Death
  - Consequences related to unhealthy alcohol use are a leading cause of preventable death in the United States, behind tobacco smoking and obesity/overweight status [5]
  - There is a 3- to 4-fold increased rate of premature death in patients with continued alcohol problems [23]
  - Leading causes of premature death include trauma-related injury, alcoholic liver disease, heart disease and stroke, cancers, and gastroesophageal disease [14]
    - Alcohol-impaired driving accounts for about one-third of all driving-related fatalities [9]
- Health problems associated with unhealthy alcohol use are many and include:
  - Cardiovascular problems: hypertension, ischemic heart disease, ischemic stroke, cardiomyopathy, atrial fibrillation [5]
    - Alcohol-related hypertension is a leading cause of reversible hypertension [14]
  - Endocrine problems: marked increase in triglycerides and LDL-C, reduced testosterone levels in males, menstrual irregularity in females, decreased bone density, diabetes [45, 23, 8]
  - Malignancy: oropharyngeal, laryngeal, gastroesophageal, hepatic, colorectal, breast cancers [45, 5]
  - Gastrointestinal problems: fatty liver, liver dysfunction, cirrhosis, esophageal varices, pancreatitis, gastritis, esophagitis, ulcers [5]
  - Mental health problems: depression, anxiety, suicide, psychosis, other substance use problems [5, 7]
  - Neurologic problems: cognitive defects, memory impairment, peripheral neuropathy, gait instability, tremor, coordination deficits, degenerative cerebellar changes, Wernicke-Korsakoff syndrome, alcohol-related seizures, dementia [8, 5]
  - Pregnancy related issues: fetal alcohol syndrome, fetal alcohol spectrum disorders, spontaneous abortion [5, 8]
  - Traumatic injury secondary to motor vehicle accidents, injuries, violence, increased risk of suicidal behavior and completed suicide [5, 8]
  - Bone marrow suppression: general bone marrow suppression, decreased erythropoiesis [4, 8]
  - Reproductive health: recurrent sexually transmitted disease, unplanned pregnancy [3]
  - Sleep issues: insomnia, sleep apnea [3]
  - Infectious disease: suppressed immune system function predisposing to infection (eg, chronic infectious disease, HIV, tuberculosis, pneumonia) [8, 45, 23]
  - Nutritional disorders (eg, thiamine, folate deficiency)

Published December 19, 2018; Updated August 9, 2019

- Social problems associated with unhealthy alcohol use are many and may include:
  - Relationship problems: problems at home, at work, with friends
  - Employment, financial, and educational problems: failure to meet job or academic obligations, loss of job, dismissal from educational opportunities
  - Legal problems: operation of vehicles or machinery while intoxicated, charges related to violence (including intimate partner violence), incarceration
- Withdrawal[46]
  - Acute withdrawal phase
    - Usually manifests several hours after diminished alcohol consumption or abstinence and usually lasts up to a week
    - Characterized by central nervous system hyperexcitability with tremors, autonomic hyperactivity, and risk for seizures and delirium tremens
  - Early abstinence phase
    - May last up to 3 to 6 weeks
    - Characterized by depressed mood, anxiety, and sleep disturbances
  - Protracted abstinence syndrome (postacute withdrawal)
    - Some patients experience prolonged withdrawal manifestations (lasting more than 3 months) after acute withdrawal phase
    - Characterized by the following:
      - Sleep disturbances, hyperreactivity to stress and discomfort, altered emotional processing, depressed mood, and elevated anxiety
      - Seemingly insignificant challenges may provoke extreme anxiety and negative affect
      - Normally pleasurable events may result in attenuation or absence of expected positive responses during this period
    - Associated with increased risk of obsessions surrounding alcohol and relapse

PROGNOSIS

- Alcohol use disorder is undertreated in the United States
  - Fewer than one-third of patients receive any treatment[5]
  - Fewer than 10% of patients receive a medication intended to prevent relapse or reduce alcohol consumption[5]
- Patients treated for alcohol use disorder
  - Alcohol use disorder is ***not*** an intractable condition[8]
    - Typical patient with effectively treated disease experiences a promising prognosis
    - Minority of patients with severe disease experience years of alcohol-related problems
  - Various treatment approaches achieve 1- to 5-year successful sobriety rates between 15% and 35%[5]
  - Patients with severe alcohol use disorder can rarely ever successfully return to controlled or moderate drinking[14]
  - Better outcomes are associated with more intense treatment, less severe alcohol problems, less cognitive impairment, higher self-confidence regarding outcome, and fewer comorbid psychiatric disorders[23]

SCREENING AND PREVENTION

SCREENING

- At-risk populations
  - Several guidelines and task force recommendations advocate for universal screening of all adults for unhealthy alcohol use[5]
    - Yearly screening is recommended by most experts;[3,47] however, it may be impractical in some instances[6]
    - Some experts recommend targeted yearly screening for certain patients at increased risk for disease or disease consequences such as:[6]
      - At high risk for unhealthy drinking (eg, smokers, adolescents, young adults)[6]
      - With symptoms that may result from heavy drinking (eg, depression, anxiety, insomnia, tremor, elevated transaminases)[6]
      - Who will be taking prescription medication[6]
      - Who may become pregnant[6]
      - Who present to emergency department[6]
      - Who are elderly, particularly with initiation of any new medication and significant change in health status[48]
      - With family history of alcohol use disorder or addiction[48]
      - Who have conditions that can be caused by alcohol use
    - Despite recommendations, most adults are not asked about alcohol use by medical providers[5]

Published December 19, 2018; Updated August 9, 2019

- Specific screening recommendations and suggestions for appropriate intervention for patients who screen positive are provided by several organizations, including:
  - Substance Abuse and Mental Health Services Administration
    - Recommends SBIRT approach (screening, brief intervention, and referral to treatment) [49]
  - US Preventive Services Task Force [50]
  - US Department of Veterans Affairs [47]
  - National Institute on Alcohol Abuse and Alcoholism [20]
  - National Institute for Health and Care Excellence [30]
- Screening tests
  - Validated screening tools for unhealthy alcohol use (risky drinking) and alcohol use disorder include: [5]
    - First tier screening tools
      - Single question screen
        - Questioning process
          - First ask if patient sometimes drinks beer, wine, or other alcoholic beverages
          - When affirmative, follow-up with single question asking how many times in the past year patient has had 5 or more drinks in a day (men younger than 65 years) or 4 or more drinks in a day (all women and men aged 65 years and older) [5]
        - Results and test characteristics
          - Response of 1 or more times establishes a positive screen [5]
          - Sensitivity is around 82% and specificity is around 79% for detecting unhealthy alcohol use [4, 5, 3]
          - Sensitivity is around 87% and specificity is around 67% for detecting alcohol use disorder [3]
      - AUDIT-C (Alcohol Use Disorders Identification Test–Consumption)
        - 3-question tool (first 3 questions of the AUDIT); takes about 1 to 2 minutes to complete [5]

AUDIT-C (Alcohol Use Disorders Identification Test–Consumption).

Questions	0 points	1 point	2 points	3 points	4 points
1. How often do you have a drink containing alcohol?	Never	Monthly	2-4 times a month	2 or 3 times a week	4 or more times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7-9	10 or more
3. How often do you have 5 or more drinks on 1 occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
AUDIT-C consists of the first 3 AUDIT questions. Threshold for positive screen is variably defined. Many sources use a cut point score for positive screen in women of 3 or more and in men of 4 or more.					

Data from Babor TF et al: AUDIT: The Alcohol Use Disorders Identification Test: Guidelines for Use in Primary Health Care. 2nd ed. Geneva, Switzerland: WHO; 2001.

      - Scores range from 0 to 12; higher scores indicate greater alcohol consumption [1]
      - Results
        - Threshold for positive screen is variably defined
        - Some sources consider a score of 3 or more for women and 4 or more for men a positive screen [5, 4]
        - Other sources report that a cutoff score of 3 suggests hazardous drinking and 4 or more suggests possible alcohol use disorder [14]
      - Test characteristics
        - Sensitivity and specificity for unhealthy alcohol use depend on cutoff threshold used and population screened
          - Using threshold score of 4 in men, sensitivity is about 86% and specificity ranges from 72% to 89% [5]
          - Using threshold score of 3 in women, sensitivity ranges from about 60% to 73% and specificity ranges from 91% to 96% [5]
    - CAGE questionnaire (cut-down, annoyed, guilty, eye-opener) [51]
      - Reasonable tool for identifying alcohol use disorder; however, CAGE questionnaire is considered inferior to single question screen and AUDIT-C for detecting full range of unhealthy alcohol use [5]
      - Questions [51]
        - Cut down: have you felt you should cut down on your alcohol consumption?
        - Annoyed: have people annoyed you by criticizing your drinking?
        - Guilt: have you felt guilty about your drinking?
        - Eye opener: have you ever had a drink first thing in the morning (ie, had an eye opener) to steady your nerves or to get rid of a hangover?

Published December 19, 2018; Updated August 9, 2019

- Results [52]
  - Any affirmative response suggests possible unhealthy drinking behavior and requires further evaluation for alcohol use disorder
  - 2 or more affirmative answers are suggestive of probable alcohol use disorder (patients with 2 or more affirmative answers are up to 7-fold more likely to have alcohol use disorder [53])
- Test characteristics
  - CAGE tool has a lower sensitivity for detecting risky drinking behavior compared with other first tier screening tools but will identify most patients with alcohol use disorder [5, 3]
  - 2 or more affirmative answers suggests a clinically significant alcohol use problem with a measured sensitivity range of 78% to 81% and specificity of 76% to 96% in various populations and settings [54]

– Second tier screening tool
- AUDIT full version (Alcohol Use Disorders Identification Test)
  - Some experts suggest using AUDIT instead of abbreviated first tier tools when clinical suspicion of alcohol use disorder is high for improved test characteristics [3]
  - 10-question tool; takes about 5 minutes to complete [5]
  - Results
    - All results must be combined with a thorough patient history and physical examination to be useful
    - Scores range from 0 to 40; higher scores indicate increased likelihood of harmful drinking [1]
    - Positive screen with high likelihood of hazardous drinking is indicated by:
      - Score of 8 or more for men up to age 60 years or 4 or more for women, adolescents, and men older than 60 years [20]
    - High likelihood of alcohol use disorder is indicated by either:
      - Total score of 13 or greater in women and 15 or greater in men [5]
      - Subscore of at least 2 points total from questions 4, 5, and 6 (total score of less than 13 for women, less than 15 for men) [5]
  - Test characteristics
    - Sensitivity and specificity for heavy alcohol use are variably reported and depend on cutoff threshold used and population screened [20]
      - Cutoff threshold of 4 or greater: sensitivity 84% to 85% and specificity 77% to 84% [1]
      - Cutoff threshold of 5 or greater: sensitivity 70% to 92% and specificity 73% to 94% [1]
  - Suggested response to scores in a primary care setting from 1 source includes [14]
    - Score 0 to 7: provide basic alcohol education
    - Score 8 to 15: advise about reducing hazardous drinking behaviors
    - Score 16 to 19: impose brief intervention and provide advice about reducing hazardous drinking behaviors. Strongly encourage patient to diminish intake. Continue monitoring
    - Score 20 to 40: refer to specialized treatment

AUDIT (Alcohol Use Disorders Identification Test).

Questions	0 points	1 point	2 points	3 points	4 points
1. How often do you have a drink containing alcohol?	Never	Monthly	2-4 times a month	2 or 3 times a week	4 or more times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7-9	10 or more
3. How often do you have 5 or more drinks on 1 occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
4. How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
5. How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
6. How often during the past year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
8. How often during the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily

Published December 19, 2018; Updated August 9, 2019

9. Have you or someone else been injured because of your drinking?	No	—	Yes, but not in the last year	—	Yes, during the last year
10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	No	—	Yes, but not in the last year	—	Yes, during the last year
Total score of 13 or higher for women and 15 or higher for men indicates a high likelihood of alcohol use disorder. A subscore of at least 2 points (total) from questions 4, 5, and 6 indicate a high likelihood of alcohol use disorder in women with a total score below 13 and men below 15.					

Data from Babor TF et al: AUDIT: The Alcohol Use Disorders Identification Test: Guidelines for Use in Primary Health Care. 2nd ed. Geneva, Switzerland: WHO; 2001.

- The US Preventive Services Task Force recommends the AUDIT, AUDIT-C, or the single-question National Institute on Alcohol Abuse and Alcoholism screen as the most accurate means of assessing for unhealthy alcohol intake [55, 50]
  - CAGE screening tool has low sensitivity at lower levels of alcohol intake
- Screening in special populations
  - Adolescents
    - CRAFFT Screening Interview was developed specifically for adolescents. It screens for alcohol and drug use and has been validated [56]
      - Made up of 6 questions. If 2 or more are answered affirmatively, test is considered positive and further evaluation should be done
        - C: have you ridden in a ***car*** driven by someone (including yourself) who was high or had been using alcohol or drugs?
        - R: do you ever use alcohol or drugs to ***relax,*** feel better about yourself, or fit in?
        - A: do you ever use alcohol or drugs while you are by yourself, ***alone***?
        - F: do you ever ***forget*** things you did while using alcohol or drugs?
        - F: do your family or ***friends*** ever tell you that you should cut down on your drinking or drug use?
        - T: have you ever gotten in ***trouble*** while you were using alcohol or drugs?
    - Single-question screening [57]
      - In the past year, how many times have you used alcohol?
        - If answer is "none," screen is considered negative. Any amount of alcohol consumption is considered a positive screen and requires further discussion and advice
    - 2-question screening tool; specific questions vary based on patient age. Questions for high schoolers include: [19]
      - In the past year, on how many days have you had more than a few sips of beer, wine, or any drink containing alcohol?
        - Any number of days drinking suggests need for further discussion and advice
      - If your friends drink, how many drinks do they usually drink on an occasion?
        - Friends drinking 3 or more drinks suggests need for further discussion and advice
  - Pregnant women
    - T-ACE (tolerance, annoyance, cut down, eye-opener), TWEAK (tolerance, worry, eye-opener, amnesia, k/cut down), and AUDIT-C are examples of tools validated for use in this population [58]
    - Include or modify at least 1 item while questioning pregnant patients to assess for ***any*** consumption of alcohol, regardless of tool used
- Provide appropriate interventions for patients who screen positive for unhealthy alcohol use or potential alcohol use disorder
  - Risky drinking behavior
    - Brief behavioral counseling provided in primary care setting may reduce self-reported unhealthy alcohol use [5, 4]
    - Clinical approach protocol is available on the National Institute on Alcohol Abuse and Alcoholism website [24]
  - Potential alcohol use disorder
    - Diagnosis requires clinical interview to assess for fulfillment of ***DSM-5*** criteria [5]
    - Treatment requires more intensive interventions with counseling and medications [5]
- Implementing screening and appropriate interventions in the primary care setting
  - Implementation may require additional support systems, changes in staffing or staff roles, formal protocols, and additional provider and staff training [5]
  - Health care provider may run into barriers, including lack of training and expertise, competing priorities, misconceptions about benefits of interventions, lack of confidence about ability to help patients with unhealthy alcohol use, and inadequate infrastructure [5]

Published December 19, 2018; Updated August 9, 2019

PREVENTION

- Educational programs are available for several target populations
  - Children and adolescents [59]
    - School- and college-based interventions
    - Anticipatory guidance delivered in primary care setting
    - Community- and family-based interventions
  - Adults [59]
    - Workplace and military interventions
  - All ages
    - Laws, taxes, and government regulations regarding (and legal consequences associated with) alcohol sale and consumption [60]

SYNOPSIS

KEY POINTS

- Alcohol use disorder is a problematic pattern of compulsive and uncontrolled alcohol use associated with clinically significant impairment or distress as defined by *DSM-5* criteria
- Often heritable, chronic, and progressive; patients with continued alcohol problems experience a 3- to 4-fold increased rate of premature death [23]
- Presentation is highly variable; however, general characterizations include inability to control drinking, continued drinking despite knowledge of consequences, and neglect of responsibilities
- Common manifestations include cravings, obsessions and compulsions regarding alcohol use, tolerance, blackouts, withdrawal, and consequences of disease (eg, health, relationship, legal, financial, employment, educational)
- Screening for unhealthy alcohol use is recommended by several guidelines and organizations
- Patients with a positive screen require further evaluation to determine if patient is a risky drinker or has alcohol use disorder; diagnosis of alcohol use disorder is based on *DSM-5* criteria
- Management of patients with risky drinking behavior involves brief behavioral counseling and close follow-up
- Management of alcohol use disorder is individualized and multidimensional; most effective strategy combines both psychosocial interventions (eg, counseling, mutual help groups) and use of medication (eg, naltrexone, acamprosate)
- Comorbid psychiatric and behavioral issues are not uncommon in patients with disorder and often require additional specialized management
- Complications related to alcohol use disorder are numerous and include potential serious health problems, social problems, withdrawal-related complications, and premature death
- Disorder is ***not*** an intractable condition; patients with effectively treated disease have a promising prognosis. Various treatment approaches result in a 1- to 5-year abstinence rate between 15% and 35% [5]

URGENT ACTION

- Patients with moderate to severe withdrawal require urgent management of manifestations; benzodiazepines are the most commonly used pharmacotherapy for medical management of alcohol withdrawal
- Certain patient populations at high risk for further disease-related health consequences (eg, pregnant women, patients presenting with severe hepatic impairment) require urgent treatment with goal of abstinence
- Unresponsive patients with alcohol intoxication and life-threatening high blood alcohol concentrations require emergent care to protect airway and vital functions and to monitor for hypoglycemia

PITFALLS

- Universal screening for unhealthy alcohol use is recommended; despite recommendations, most adults are not screened for unhealthy alcohol use by medical providers in the primary care setting [5]
- Patients may not be rigorously honest (ie, may deny or minimize) in reporting amount and frequency of consumption; history obtained from family and friends may depict a more accurate account of consumption history
- Most patients with alcohol use disorder do not receive appropriate multimodal treatment
  - Recommendations regarding appropriate counseling and mutual help group interventions for unhealthy alcohol use are in place; despite recommendations, most patients do not receive appropriate interventions [5, 34]
  - Pharmacotherapy for alcohol use disorder is appropriate and effective for many patients; despite evidence that it is effective, pharmacotherapy is often underused [34, 9, 1]
- Maintain a high degree of suspicion for alcohol use disorder in patients presenting with unexplained medical diagnosis that may represent potential complications related to disorder; patients with unhealthy alcohol consumption may not be forthright with amount and frequency of alcohol intake (minimization, denial)
  - Alcohol-related hypertension is a leading cause of reversible hypertension

SELECTED REFERENCES

1 Kranzler HR et al: Diagnosis and pharmacotherapy of alcohol use disorder: a review. JAMA. 320(8):815-24, 2018
2 Seneviratne C et al: Advances in medications and tailoring treatment for alcohol use disorder. Alcohol Res. 37(1):15-28, 2015

Published December 19, 2018; Updated August 9, 2019

3 Spithoff S et al: Primary care management of alcohol use disorder and at-risk drinking: part 1: screening and assessment. Can Fam Physician. 61(6):509-14, 2015
4 Pace CA et al: Addressing unhealthy substance use in primary care. Med Clin North Am. 102(4):567-86, 2018
5 Jonas DE et al: Screening and counseling for unhealthy alcohol use in primary care settings. Med Clin North Am. 101(4):823-37, 2017
6 Willenbring ML et al: Helping patients who drink too much: an evidence-based guide for primary care clinicians. Am Fam Physician. 80(1):44-50, 2009
7 Akbar M et al: Medications for alcohol use disorders: an overview. Pharmacol Ther. 185:64-85, 2018
8 American Psychiatric Association: Alcohol related disorders. In: Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Arlington, VA: American Psychiatric Association; 2013:490-503
9 Holt SR et al: Pharmacotherapy for alcohol use disorder. Med Clin North Am. 102(4):653-66, 2018
10 Lee H et al: Alcohol-induced blackout. Int J Environ Res Public Health. 6(11):2783-92, 2009
11 Hopwood CJ et al: Pathological personality traits among patients with absent, current, and remitted substance use disorders. Addict Behav. 36(11):1087-90, 2011
12 Sher KJ et al: The development of alcohol use disorders. Annu Rev Clin Psychol. 1:493-523, 2005
13 Nolen-Hoeksema S: Gender differences in risk factors and consequences for alcohol use and problems. Clin Psychol Rev. 24(8):981-1010, 2004
14 Connor JP et al: Alcohol use disorders. Lancet. 387(10022):988-98, 2016
15 Deak JD et al: Genetics of alcohol use disorder: a review. Curr Opin Psychol. 27:56-61, 2018
16 Tawa EA et al: Overview of the genetics of alcohol use disorder. Alcohol Alcohol. 51(5):507-14, 2016
17 Stewart SH et al: Medication-enhanced behavior therapy for alcohol use disorder: naltrexone, Alcoholics Anonymous facilitation, and OPRM1 genetic variation. J Subst Abuse Treat. 104:7-14, 2019
18 McCabe SE et al: Sexual orientation, substance use behaviors and substance dependence in the United States. Addiction. 104(8):1333-45, 2009
19 National Institute on Alcohol Abuse and Alcoholism: Alcohol Screening and Brief Intervention for Youth: A Practitioner's Guide. NIAAA website. Revised October 2015. Accessed September 3, 2019. https://www.niaaa.nih.gov/youthguide
20 National Institute on Alcohol Abuse and Alcoholism: Helping patients who drink too much: a clinician's guide and related professional support resources. NIAAA website. Updated 2008. Accessed September 3, 2019. https://www.niaaa.nih.gov/guide
21 Substance Abuse and Mental Health Services Administration: Medication for the Treatment of Alcohol Use Disorder: A Brief Guide. SAMHSA website. Published October 2015. Accessed September 3, 2019. https://store.samhsa.gov/product/Medication-for-the-Treatment-of-Alcohol-Use-Disorder-A-Brief-Guide/SMA15-4907
22 Ingall GB: Alcohol biomarkers. Clin Lab Med. 32(3):391-406, 2012
23 Schuckit MA: Alcohol-use disorders. Lancet. 373(9662):492-501, 2009
24 National Institute on Alcohol Abuse and Alcoholism: How to Help Patients: A Clinical Approach. NIH website. Updated January 2007. Accessed September 3, 2019. https://pubs.niaaa.nih.gov/publications/Practitioner/CliniciansGuide2005/clinicians_guide8.htm
25 Mee-Lee DE: The ASAM Criteria: Treatment Criteria for Addictive, Substance-Related, and Co-Occurring Conditions. 3rd ed. Rockville, MD: American Society of Addiction Medicine; 2013
26 National Institute on Alcohol Abuse and Alcoholism: Online Materials for Clinicians and Patients. NIH website. Accessed September 3, 2019. https://pubs.niaaa.nih.gov/publications/Practitioner/CliniciansGuide2005/clinicians_guide24_cp_mats.htm
27 Jonas DE et al: Pharmacotherapy for adults with alcohol use disorders in outpatient settings: a systematic review and meta-analysis. JAMA. 311(18):1889-900, 2014
28 US Department of Health and Human Services: Helping Patients Who Drink Too Much: A Clinician's Guide. Updated 2005 Edition. NIAAA website. Published 2005. Accessed September 3, 2019. https://pubs.niaaa.nih.gov/publications/practitioner/cliniciansguide2005/guide.pdf
29 Reus VI et al: The American Psychiatric Association practice guideline for the pharmacological treatment of patients with alcohol use disorder. Am J Psychiatry. 175(1):86-90, 2018
30 National Institute for Health and Care Excellence: Alcohol-Use Disorders: Diagnosis, Assessment and Management of Harmful Drinking (High-Risk Drinking) and Alcohol Dependence. Clinical Guideline [CG115]. National Institute for Health and Care Excellence website. Published February 2011. Updated August 2019. Accessed December 7, 2018. https://www.nice.org.uk/guidance/cg115
31 Mason BJ et al: Gabapentin treatment for alcohol dependence: a randomized clinical trial. JAMA Intern Med. 174(1):70-7, 2014
32 Spithoff S et al: Primary care management of alcohol use disorder and at-risk drinking: part 2: counsel, prescribe, connect. Can Fam Physician. 61(6):515-21, 2015
33 Hamza DM et al: A systematic review of treatment modalities for alcohol use disorder. J Subst Abus Alcohol. 2(3):1023, 2014
34 US Department of Health and Human Services: 5-Point Strategy to Combat the Opioid Crisis. HHS website. Reviewed August 7, 2018. Accessed September 3, 2019. https://www.hhs.gov/opioids/about-the-epidemic/hhs-response/index.html
35 Monterosso JR et al: Predicting treatment response to naltrexone: the influence of craving and family history. Am J Addict. 10(3):258-68, 2001
36 Alcoholics Anonymous website. Accessed September 3, 2019. http://www.aa.org/
37 SMART Recovery: Self-Management and Recovery Training. SMART Recovery website. Accessed September 3, 2019. https://www.smartrecovery.org/
38 Substance Abuse and Mental Health Services Administration: Behavior Health Treatment Services Locator. SAMHSA website. Accessed September 3, 2019. https://www.findtreatment.samhsa.gov/
39 Edelman EJ et al: Office-based addiction treatment in primary care: approaches that work. Med Clin North Am. 102(4):635-52, 2018
40 Denny CH et al: Consumption of alcohol beverages and binge drinking among pregnant women aged 18-44 years - United States, 2015-2017. MMWR Morb Mortal Wkly Rep. 68(16):365-8, 2019
41 Winslow BT et al: Medications for alcohol use disorder. Am Fam Physician. 93(6):457-65, 2016
42 Thibaut F et al: WFSBP and IAWMH guidelines for the treatment of alcohol use disorders in pregnant women. World J Biol Psychiatry. 20(1):17-50, 2019
43 Baca CT et al: Smoking cessation during substance abuse treatment: what you need to know. J Subst Abuse Treat. 36(2):205-19, 2009
44 RTI International: Alcohol Urge Questionnaire. Version 26.0. PhenX Toolkit website. Published June 4, 2019. Accessed September 3, 2019. https://www.phenxtoolkit.org/protocols/view/520301
45 Rehm J: The risks associated with alcohol use and alcoholism. Alcohol Res Health. 34(2):135-43, 2011
46 Heilig M et al: Acute withdrawal, protracted abstinence and negative affect in alcoholism: are they linked? Addict Biol. 15(2):169-84, 2010
47 US Department of Veterans Affairs: VA/DoD Clinical Practice Guidelines: Management of Substance Abuse Disorders. VA website. Published 2015. Accessed September 3, 2019. https://www.healthquality.va.gov/guidelines/mh/sud/
48 National Institute on Alcohol Abuse and Alcoholism: Alcohol Alert Number 65: Screening for Alcohol Use and Alcohol Related Problems. NIAAA website. Published April 2005. Accessed September 3, 2019. https://pubs.niaaa.nih.gov/publications/aa65/aa65.htm
49 SAMHSA-HRSA Center for Integrated Health Solutions: SBIRT: Screening, Brief Intervention, and Referral to Treatment. SAMHSA-HRSA website. Accessed September 3, 2019. https://www.integration.samhsa.gov/clinical-practice/sbirt
50 US Preventive Services Task Force et al: Screening and behavioral counseling interventions to reduce unhealthy alcohol use in adolescents and adults: US Preventive Services Task Force recommendation statement. JAMA. 320(18):1899-909, 2018
51 Ewing JA: Detecting alcoholism. The CAGE questionnaire. JAMA. 252(14):1905-7, 1984
52 Scully C: Substance dependence. In: Scully C et al, eds: Scully's Medical Problems in Dentistry. 7th ed. London, England: Churchill Livingstone; 2014:749-73
53 Bagheri SC: Medical conditions. In: Bagheri SC, ed: Clinical Review of Oral and Maxillofacial Surgery: A Case-Based Approach. 2nd ed. St Louis, MO: Elsevier; 2014:489-538
54 Roffman JL et al: Diagnostic rating scales and laboratory tests. In: Stern TA et al, eds: Massachusetts General Hospital Handbook of General Hospital Psychiatry. 7th ed. St Louis, MO: Elsevier; 2018:59-68.e2
55 Dasarathy J et al: Alcohol use disorder: how best to screen and intervene. J Fam Pract. 68(1):35-9, 2019
56 Knight JR et al: Validity of the CRAFFT substance abuse screening test among adolescent clinic patients. Arch Pediatr Adolesc Med. 156(6):607-14, 2002
57 Levy S et al: An electronic screen for triaging adolescent substance use by risk levels. JAMA Pediatr. 168(9):822-8, 2014
58 Burns E et al: Brief screening questionnaires to identify problem drinking during pregnancy: a systematic review. Addiction. 105(4):601-14, 2010

Published December 19, 2018; Updated August 9, 2019

59 National Institute on Alcohol Abuse and Alcoholism: Alcohol Alert Number 83: Preventing Alcohol Abuse and Alcoholism--An Update. NIAAA website. Accessed September 3, 2019. https://pubs.niaaa.nih.gov/publications/aa83/aa83.htm
60 CDC: Fact Sheets--Preventing Excessive Alcohol Use. CDC website. Reviewed October 17, 2016. Accessed September 3, 2019. https://www.cdc.gov/alcohol/fact-sheets/prevention.htm

Published December 19, 2018; Updated August 9, 2019