

# **ALCOHOL WITHDRAWAL SYNDROME**

## **Abstract**

When a person with a history of chronic alcohol use stops drinking alcohol, there is the risk of developing alcohol withdrawal syndrome. Healthcare workers need to understand and anticipate the underlying physical responses to chronic alcohol use and withdrawal, and the recommended methods to evaluate the severity of the patient's level of withdrawal to initiate proper treatment. Alcohol withdrawal syndrome can cause life-threatening health complications and death. The physical signs and symptoms of alcohol withdrawal and the role of the caregiver, including the Certified Nursing Assistant to support the affected patient through recovery are discussed.

## **Learning Objectives**

1. Identify how alcohol causes intoxication.
2. Identify the blood alcohol level that is considered to be legal intoxication.
3. Identify signs and symptoms of acute alcohol intoxication.
4. Identify the most important criteria that define alcohol withdrawal syndrome.
5. Identify CNA responsibilities when caring for patients in alcohol withdrawal.

## **Introduction**

Alcohol is the most commonly misused drug in the United States. A person who chronically misuses alcohol and stops drinking is at risk for developing alcohol withdrawal syndrome, which is characterized by intense neurological and cardiovascular signs and symptoms. It is a frequent reason for hospital admissions, and it is a serious medical problem that causes significant illness and may even be fatal. Patients who are suffering from alcohol withdrawal syndrome require skilled care and attention. The following sections discuss alcohol as a drug, the signs and symptoms of acute alcohol intoxication, and alcohol withdrawal syndrome. The responsibilities of a Certified Nursing Assistant (CNA) when caring for a patient who has an alcohol use disorder and has suddenly stopped drinking will also be addressed.

### **Alcohol Use Disorder and Public Health Burden**

An alcohol use disorder is a tremendous public health problem. There are approximately 8 million Americans who chronically use alcohol and who may fall into the criteria of an alcohol use disorder. An alcohol use disorder is the cause of many acute and chronic medical problems. One of the most serious of the medical problems is alcohol withdrawal syndrome. There are no completely inclusive statistics, but it has been estimated that each year in the United States there is approximately half million people who need treatment for alcohol withdrawal syndrome.

### **Alcohol as an Intoxicant**

Alcohol is a legal beverage and it is consumed for its taste, but alcohol is also a drug. It is consumed because it is intoxicating; people drink alcohol, in part, to get high. The exact mechanism by which alcohol is

intoxicating is not completely understood. However, most of the evidence suggests that alcohol acts as an intoxicant because it increases the effects of gamma aminobutyric acid (GABA) and decreases the effects of glutamate. Gamma aminobutyric acid and glutamate are naturally occurring compounds found in the brain and other parts of the nervous system.

Gamma aminobutyric and glutamate are neurotransmitters. GABA depresses the level of consciousness while glutamate is an excitatory compound. Because alcohol increases the effect of GABA and decreases the effect of glutamate, it is clear why the principle effect of alcohol intoxication is drowsiness and central nervous system depression. Alcohol, also referred to as ethanol, is produced by fermenting the sugars found in grains and fruits. Ethanol is found in beer, hard liquors, wines, and other alcoholic beverages. It is also used in cologne, hair spray, hand sanitizers, mouthwashes, and perfume.

Other types of alcohols are ethylene glycol, isopropyl alcohol, and methanol, and they are often called the "toxic alcohols." These alcohols can be intoxicating, just as ethanol can be, however, they are poisonous and should never be consumed. Even small amounts of these toxic alcohols can be dangerous.

Alcohol is rapidly absorbed in the stomach and small intestine. Once alcohol enters the bloodstream, it then travels to the liver. In the liver, alcohol is metabolized by enzyme systems and eventually converted to water and compounds that are used for energy. There is also a gastric enzyme in the stomach that breaks down some alcohol before it can

enter the bloodstream. Women have a lower level of this gastric enzyme, so more of the alcohol they ingest is absorbed. If a woman and a man of equal body weight are given the same amount of alcohol, the woman will have a higher blood alcohol level, and she will look and feel more intoxicated.

Social drinkers eliminate alcohol at a rate of 15-20 mg/dL an hour. Chronic alcohol users eliminate alcohol a bit more quickly. Blood alcohol level measurements are important for CNA's to understand, and these will be explained in a later section.

### **Alcohol Intoxication**

The level of alcohol intoxication depends on many factors. It depends on the percentage of alcohol in the beverage, how much is ingested and how quickly it is ingested, a person's body weight and gender, how often and how much a person drinks, and the presence of food in the stomach. Intoxication begins fairly quickly after an alcoholic beverage is consumed. Most people begin to feel the effects within 15-30 minutes, and the peak blood level is reached approximately one hour after ingestion.

Acute alcohol intoxication produces many clinical effects. The signs and symptoms of alcohol intoxication can range from mild drowsiness to coma and death. If ethanol is mixed with other drugs such as cocaine, sedatives, or sleep medications, there is the risk of serious harm.

The most common and clinically important signs and symptoms of acute alcohol intoxication are neurologic, respiratory, cardiovascular, body temperature, hypoglycemia, and gastrointestinal. Wernicke's

encephalopathy and Korsakoff's psychosis are a neurological disorder caused by depletion of thiamine and the B vitamin reserves.

### **Neurologic**

In small amounts ethanol can be a stimulant. An intoxicated person feels euphoric and the person's inhibitions are lowered. In higher amounts, ethanol is a central nervous system depressant. The more someone drinks, the drowsier that person will become, and it is possible to drink alcohol to the point of causing coma. Alcohol also impairs coordination, gait, logical or rational thinking, memory, speech, and vision. Basically, someone who is intoxicated cannot walk straight, cannot think straight, and cannot see straight. That person will not be able act or think logically and will be unable to speak clearly. An intoxicated person will stagger, and will have slurred speech, blurred vision, and complex mental or physical tasks cannot be performed.

### **Respiratory**

Alcohol is a respiratory system depressant. Alcohol decreases the respiratory rate and the depth of each breath. People who die from acute alcohol intoxication will succumb because they stop breathing or their respiratory effort is inadequate.

### **Cardiovascular**

Ethanol intoxication causes tachycardia and hypotension.

### **Body Temperature**

Ethanol decreases muscle activity, dilates blood vessels, and decreases metabolic rate. All of these can combine to cause hypothermia.

## **Hypoglycemia**

People who are profoundly intoxicated may not be able to eat. If this happens, the body consumes stored glucose for energy but eventually the glucose that is stored in the liver and the muscles is depleted. When this happens to someone who is not intoxicated, that person can simply get something to eat or new glucose can be formed from fat stores. However, a deeply intoxicated person may not be able to eat. In these cases, alcohol intoxication interrupts the process of forming glucose from fat stores. Because of these issues, someone who is very intoxicated can become severely hypoglycemic. This is much more likely to happen to intoxicated children because they have comparatively smaller stores of glucose.

## **Gastrointestinal**

Nausea and vomiting are commonly seen in an intoxicated person.

## **Wernicke's Encephalopathy and Korsakoff's Psychosis**

Wernicke's encephalopathy and Korsakoff's psychosis are neurological complications of chronic alcohol use and are serious conditions. They are both complicated metabolic abnormalities that can cause amnesia, coma, confusion, disorientation, psychotic behavior and many other neurological disorders.

The mortality rate for Wernicke's encephalopathy is approximately 10-20%, and it is considered a medical emergency. Fortunately, these complications are not common. The chronic effects of alcohol use can affect essentially every organ system. People who habitually drink to

excess have neurological damage, cardiac damage, bleeding problems, liver damage, and decreased life expectancy.

### **CAGE Questionnaire**

It can be difficult to determine if someone chronically consumes alcohol. There are many ways to diagnose an alcohol use disorder. The CAGE test is a simple screening tool that can be useful for diagnosing an alcohol use disorder. When using the CAGE test, the following questions are asked.

- Have you ever felt you should **C**ut down on your drinking?
- Do you get **A**nnoyed when people ask you about your drinking?
- Have you ever felt **G**uilty about your drinking?
- Do you often feel the need for an **E**ye opener? This question pertains to the patient needing a drink first thing in the morning for a feeling of nervousness. If someone answers yes to two or more of these questions, that person is likely to have an alcohol problem. However, the CAGE test is just a simple screening tool and it is not definitive. The case study presented at the last section will elucidate limitations of the CAGE test.

### **Blood Alcohol Levels**

Blood alcohol levels can be used to determine if someone is intoxicated. The “legal limit” of blood alcohol for intoxication is 80 mg/dL in most jurisdictions. If a person’s blood alcohol concentration is measured at that level, or above, that person is considered legally intoxicated. To reach a blood alcohol level of 80 mg/dL, a 160-pound man would need to drink a little less than three (2 ½), 12-ounce bottles of beer.

Blood alcohol levels are usually measured using mg/dL. This means milligrams of alcohol per 100 milliliters of blood. There are other ways to measure and report blood alcohol concentrations and these are used occasionally. For example, a blood alcohol level of 80 mg/dL can also be reported as 0.08 g/dL or 0.08%. However, there is considerable individual variation in tolerance of blood alcohol levels. Someone who chronically uses alcohol can function to a degree with a blood alcohol level that would cause significant impairment in a person who is alcohol naïve or who only drinks occasionally. For most people, the higher the blood alcohol level the greater the degree of impairment. The following chart provides an approximation of the effects that are seen with a particular blood alcohol level.

**Table I: Blood Alcohol Concentrations and Degree of Impairment**

<p><b>0-50 mg/dL:</b> Decreased inhibitions, impaired judgment <b>100 mg/dL:</b> Slurred speech, unsteady gait, inability to perform fine motor movements, confusion, tachycardia, slowed reaction time <b>200 mg/dL:</b> Staggering when walking, incoherent sentences, significant drowsiness and memory loss <b>300 mg/dL:</b> Somnolent, hypotension and respiratory depression <b>400 mg/dL:</b> Typically comatose, hypotensive, respiratory depression, incontinent of urine and stool <b>500 mg/dL:</b> Severe hypotension, respiratory depression, compromised breathing with inadequate oxygen delivery, absent gag reflex, and aspiration. Death is possible.</p>
--

### **Causes of Alcohol Withdrawal Syndrome**

Alcohol withdrawal syndrome can be defined as a characteristic group of signs and symptoms that occur when someone who chronically uses alcohol suddenly stops drinking. The longer someone has been



drinking and the more alcohol that person consumes on a daily basis, the more likely it is that alcohol withdrawal syndrome will occur. The severity of alcohol withdrawal syndrome also depends in part on someone's drinking pattern. A patient can be said to have alcohol withdrawal syndrome if the following criteria are met.

### **Diagnostic Criteria for Alcohol Withdrawal Syndrome**

The diagnostic criteria for alcohol withdrawal syndrome includes the chronic use of alcohol, excessive drinking, and the sudden cessation of drinking. These are the three most important criteria that define alcohol withdrawal syndrome.

A person who drinks excessive alcohol may have two or more of the following signs and symptoms starting a few hours, or a day or two after alcohol cessation. These signs and symptoms are an indication the person is having alcohol withdrawal syndrome.

- Agitation
- Anxiety
- Confusion
- Hallucinations
- Insomnia
- Nausea
- Seizures
- Sweating
- Tachycardia
- Tremors
- Vomiting

The signs and symptoms of alcohol withdrawal are so intense and disabling that a patient cannot function socially or while at work. The signs and symptoms are not accounted for by a pre-existing or recently developed medical or psychiatric condition.

It is important to remember that the clinical manifestations of alcohol withdrawal syndrome can be quite intense. In severe cases and if a patient has underlying cardiac, medical, or psychiatric illnesses, alcohol withdrawal syndrome can be dangerous. The signs and symptoms and the clinical features of alcohol withdrawal syndrome will be discussed in a later section.

The first criteria for alcohol withdrawal syndrome is that a patient is a chronic, heavy drinker, and is drinking a lot, every day. Alcohol withdrawal syndrome does not happen to people who drink occasionally or who are intermittent binge drinkers. The reason for this explains the basic mechanisms that are the cause of alcohol withdrawal syndrome.

When someone drinks a lot of alcohol every day, that person develops an alcohol use disorder and craving for alcohol. When a person craves alcohol to the point of having an alcohol use disorder this can cause complicated physical and biochemical changes in GABA and glutamate. It should be remembered that alcohol increases the effect of GABA and decreases the effect of glutamate. Gamma aminobutyric acid causes central nervous system depression (drowsiness) and glutamate causes central nervous system excitation (agitation, hyperactivity).

The central nervous system of a long-term alcohol user is depressed because the activity of GABA is increased and the activity of glutamate is decreased. The body adjusts to this by increasing the activity of the sympathetic branch of the nervous system. This is the part of the nervous system that increases blood pressure, increases heart rate, dilates the pupils, increases sweating, and increases the level of mental alertness. But when a chronic alcohol user stops drinking, the inhibitory effect of the changes in GABA and glutamate are withdrawn, but the increased sympathetic stimulation remains. The chronic drinker develops anxiety, agitation, diaphoresis, hypertension, tachycardia, and other classic signs and symptoms of alcohol withdrawal syndrome.

**Table II: The Physiologic Basis of Alcohol Withdrawal Syndrome**



A following simple analogy can elucidate alcohol withdrawal syndrome: a person driving a car steps on the brakes and the accelerator, and then suddenly the person takes releases the brakes but not the

accelerator, which causes the car to speed up. Someone who has been chronically using alcohol has the brakes on (the increase in GABA activity and the decrease in glutamate activity) and the body is trying to compensate for this by stepping on the accelerator (increasing sympathetic nervous system activity). Alcohol intake is suddenly stopped - the increased GABA and decreased glutamate activity is stopped - but the accelerator, the increased sympathetic stimulation, is still being applied. The result is alcohol withdrawal syndrome.

### **Alcohol Withdrawal Syndrome Signs and Symptoms**

Alcohol withdrawal syndrome is often called delirium tremens, or the "D.T.s", and some people refer to it as "rum fits." Someone who has alcohol withdrawal syndrome is imagined to be delirious and shaky (the delirium and the tremens) and completely out of control (the rum fits). The descriptions are accurate to an extent, but alcohol withdrawal syndrome is a complex clinical condition that develops over time and that progresses through stages.

There are signs and symptoms that are commonly seen, but each patient with alcohol withdrawal syndrome will appear differently. The onset of alcohol withdrawal syndrome varies. Onset can be within a few hours after someone stops drinking, but it may also take a day or more for alcohol withdrawal syndrome to start. The progression of alcohol withdrawal syndrome typically moves through the following four stages.

#### **Stage 1**

The first stage is characterized by relatively mild signs and symptoms. The patient will complain of anxiety and nausea. The pulse and blood

pressure will be slightly elevated. Tremors, especially hand shaking, will be obvious. Stage 1 usually continues for 24 hours, more or less.

## **Stage 2**

Stage 2 usually starts within 24 hours after someone has stopped drinking, but it may not start for a week. The patient in this stage has many of the signs and symptoms seen in Stage 1, but they are more severe. Most people are oriented to time, place, and person. However, auditory, tactile and visual hallucinations are common. Diaphoresis, a mild fever, hypertension, severe tremor, and tachycardia are present.

## **Stage 3:**

In stage 3 the patient's signs and symptoms are an extension of the ones seen in Stage 2, but are more severe. Tonic-clonic seizures are possible. Stage 3 usually starts 24-48 hours after drinking cessation.

## **Stage 4:**

During stage 4 the patient is incapacitated. Confusion, delirium, and disorientation are common and the patient is a danger to himself and to others. Dehydration, electrolyte abnormalities, and significant elevations of the blood pressure and heart rate are common.

Cardiovascular, metabolic, and respiratory problems can be severe, especially in patients who are elderly or have pre-existing diseases. Stage 4 typically begins within two to five days after someone has stopped drinking.

Delirium is defined as a state of extreme confusion along with extreme agitation. The signs and symptoms and the stages of alcohol withdrawal syndrome vary from person to person. Not everyone goes through the stages in a step-by-step manner, and some people do not

progress to Stage 3 or 4. Depending on how much the patient drinks, how long the patient has been abstinent, and when that patient presents to the hospital, the patient may be in Stage 1 or Stage 2 or may be in an advanced stage of alcohol withdrawal upon arrival to the hospital.

Patient assessment of the severity of alcohol withdrawal syndrome is generally done using the Clinical Institute Withdrawal Assessment for Alcohol Scale, Revised (CIWA-Ar) assessment scale, shown in Table III. This assessment will be performed by a physician or a registered nurse, and the CIWA-Ar assessment tool can be used to track someone's progress, as well. A CIWA-Ar score of 10 or higher indicates that the patient is having a severe case of alcohol withdrawal and is at risk for complications.

Alcohol withdrawal syndrome is a serious medical problem. An approximate 1-5% of people with alcohol withdrawal syndrome will die. Most of the fatalities involve complicated cases; if a patient is relatively healthy and is in Stage 1 or Stage 2, the patient should survive. If a patient has pre-existing medical problems and progresses to Stage 3 or Stage 4, there is a real risk that the patient could die. Death is usually caused by complications. Many years ago, the mortality rate for alcohol withdrawal syndrome was as high as 20%.

**Table III: The CIWA-Ar Scale**

## Clinical Institute Withdrawal Assessment of Alcohol Scale, Revised (CIWA-Ar)

Patient: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ (24 hour clock, midnight = 00:00)

Pulse or heart rate, taken for one minute: \_\_\_\_\_ Blood pressure: \_\_\_\_\_

**NAUSEA AND VOMITING** – Ask "Do you feel sick to your stomach? Have you vomited?" Observation.

- 0 no nausea and no vomiting
- 1 mild nausea with no vomiting
- 2
- 3
- 4 intermittent nausea with dry heaves
- 5
- 6
- 7 constant nausea, frequent dry heaves and vomiting

**TACTILE DISTURBANCES** – Ask "Have you any itching, pins and needles sensations, any burning, any numbness, or do you feel bugs crawling on or under your skin?" Observation.

- 0 none
- 1 very mild itching, pins and needles, burning or numbness
- 2 mild itching, pins and needles, burning or numbness
- 3 moderate itching, pins and needles, burning or numbness
- 4 moderately severe hallucinations
- 5 severe hallucinations
- 6 extremely severe hallucinations
- 7 continuous hallucinations

**TREMOR** – Arms extended and fingers spread apart. Observation.

- 0 no tremor
- 1 not visible, but can be felt fingertip to fingertip
- 2
- 3
- 4 moderate, with patient's arms extended
- 5
- 6
- 7 severe, even with arms not extended

**AUDITORY DISTURBANCES** -- Ask "Are you more aware of sounds around you? Are they harsh? Do they frighten you? Are you hearing anything that is disturbing to you? Are you hearing things you know are not there?" Observation.

- 0 not present
- 1 very mild harshness or ability to frighten
- 2 mild harshness or ability to frighten
- 3 moderate harshness or ability to frighten
- 4 moderately severe hallucinations
- 5 severe hallucinations
- 6 extremely severe hallucinations
- 7 continuous hallucinations

**PAROXYSMAL SWEATS** -- Observation.

- 0 no sweat visible
- 1 barely perceptible sweating, palms moist
- 2
- 3
- 4 beads of sweat obvious on forehead
- 5
- 6
- 7 drenching sweats

**VISUAL DISTURBANCES** – Ask "Does the light appear to be too bright? Is its color different? Does it hurt your eyes? Are you seeing anything that is disturbing to you? Are you seeing things you know are not there?" Observation.

- 0 not present
- 1 very mild sensitivity
- 2 mild sensitivity
- 3 moderate sensitivity
- 4 moderately severe hallucinations
- 5 severe hallucinations
- 6 extremely severe hallucinations
- 7 continuous hallucinations

**ANXIETY** -- Ask "Do you feel nervous?" Observation.

- 0 no anxiety, at ease
- 1 mild anxious
- 2
- 3
- 4 moderately anxious, or guarded, so anxiety is inferred
- 5
- 6
- 7 equivalent to acute panic states as seen in severe delirium or acute schizophrenic reactions

**HEADACHE, FULLNESS IN HEAD** -- Ask "Does your head feel different? Does it feel like there is a band around your head?" Do not rate for dizziness or lightheadedness. Otherwise, rate severity.

- 0 not present
- 1 very mild
- 2 mild
- 3 moderate
- 4 moderately severe
- 5 severe
- 6 very severe
- 7 extremely severe

Early recognition and aggressive treatment of alcohol withdrawal syndrome have reduced the risk of serious outcome and death significantly.

### **Alcohol Intoxication and Hangover**

If someone drinks to the point of intoxication, it is common for that person to have what is commonly called a hangover. Someone with a hangover will have abdominal pain, diarrhea, headache, nausea, and vomiting. These signs and symptoms may last for 24 hours.

Alcohol withdrawal syndrome and a hangover are different conditions with different causes. A hangover is caused by dehydration (alcohol acts as a diuretic) and by some of the metabolic by-products of alcohol. The signs and symptoms of a hangover and of alcohol withdrawal syndrome are similar but with a hangover they do not last as long, are not as intense, and serious problems such as delirium, hallucinations, and seizures do not happen. A hangover is unpleasant but it is not dangerous. Chronic alcohol users can develop a hangover, and they will often keep drinking to prevent a hangover.

### **Alcohol Withdrawal Syndrome Treatment**

Most patients who develop alcohol withdrawal syndrome do not progress to Stage 3 or Stage 4 but the signs and symptoms of Stage 1 and Stage 2, the agitation, fever, hallucinations, hypertension, *etc.*, are serious, especially if a patient has pre-existing medical or psychiatric problems. Fortunately, if alcohol withdrawal syndrome is quickly recognized and diagnosed and if a patient receives the appropriate treatment, the outcome should be good. Alcohol withdrawal syndrome can last for 24 hours or less if a patient never



progresses beyond Stage 1. If the syndrome progresses to Stage 3 or Stage 4, the signs and symptoms may last for two weeks, and many of these patients need to be admitted to an intensive care unit.

There is no cure for alcohol withdrawal syndrome. The patient can only be supported while going through withdrawal. Symptomatic and supportive care is the preferred treatment. However, it is possible to prevent a mild case of alcohol withdrawal syndrome from progressing to Stage 3 or Stage 4, and it is also possible to avoid the complications that are usually the cause of death. Treatment of alcohol withdrawal syndrome should focus on these three goals: 1) identification, 2) supportive care, and 3) managing complications.

### **Identifying a Problem**

How can the healthcare worker know if someone is having an alcohol withdrawal syndrome? There is a saying in medicine: "If you don't know what something is and you've never heard of it, you can't diagnose it or identify it." Awareness of the extent of alcohol use in the U.S., and awareness of alcohol withdrawal syndrome is important and is the first step to identifying the problem.

Identifying alcohol withdrawal syndrome is not always easy, even if a caregiver knows how common an alcohol use disorder is and knows about alcohol withdrawal syndrome. There are several important reasons why identifying alcohol withdrawal is difficult. Perhaps the most important reason is patient denial. Many people who use alcohol do not tell healthcare professionals about their drinking habits. Even a patient's family and friends may be unaware that the patient uses alcohol to a dangerous level.

The extent of someone's alcohol use may only become apparent when that person cannot drink - for example, when they are admitted to the hospital. If that happens, the chronic alcohol user begins to become anxious and agitated, starts to sweat and become feverish (which are the typical signs and symptoms of alcohol withdrawal syndrome), but because the patient's drinking habit is a secret, this clinical picture is mistaken for a medical issue.

The situation is made worse because the diagnostic criteria for alcohol withdrawal syndrome are nonspecific. There are many medical conditions that cause fever, sweating, tachycardia, and the other commonly seen signs and symptoms of alcohol withdrawal syndrome. In order to know that a patient is going through alcohol withdrawal, a clinician needs to know that the patient drinks. There is no test that can prove someone has an alcohol use disorder; the alcohol use has to be admitted to by the patient or observed by others. So making a quick diagnosis of alcohol withdrawal syndrome really depends on the patient telling someone about an existing drinking problem.

Most people who are chronic, heavy drinkers will not be forthcoming about their drinking habits. Denial of alcohol use is a common response. A clinician should not expect a chronic, heavy drinker to admit to drinking, especially if the person drinks a lot. It is possible that someone may be honest about heavy drinking, but it is unlikely. It is also important to know that many people who do use alcohol heavily may admit to drinking, but only to a point. Someone who is having the signs and symptoms of alcohol withdrawal syndrome might admit to having "two or three drinks a day" but the truth is often that this person is drinking much more.

A study conducted by the Substance misuse and Mental Health Administration examined data about alcohol use disorder. The conclusion from this study was that only 1.7% of all people who were chronic users of alcohol thought they had a problem and needed treatment. Denial of an alcohol use disorder is common.

Because it can be difficult to identify someone who chronically uses alcohol, many healthcare professionals will specifically ask patients about a pattern of alcohol use and about the use of illicit drugs, as part of a standard patient interview. Asking these questions should be standard procedure, and almost everyone who is admitted to a healthcare facility should be asked about their drinking habits and their use or nonuse of illicit drugs. It should be remembered that denial is common and alcohol use is widespread. If someone develops the signs and symptoms of alcohol withdrawal syndrome, the possibility of having an alcohol withdrawal syndrome should be considered.

### **Supportive Care: Patient Safety**

Supportive care is the most important treatment for alcohol withdrawal syndrome. With good supportive care, patients should survive, and the complications that cause morbidity and mortality can be avoided. Alcohol withdrawal syndrome cannot be cured but it can be successfully treated with good supportive care.

The most important aspect of supportive care that CNAs are responsible for is *patient safety*. Patient safety is the primary responsibility in these situations. Most patients who are going through an alcohol withdrawal syndrome will not reach the point of confusion

and delirium of Stage 3 or 4 but some will; and people who are in Stage 1 or Stage 2 will be agitated, anxious, and possibly hallucinating. Patients who are going through alcohol withdrawal syndrome can cause harm to themselves or others, and they need to be closely monitored to ensure their safety.

How does a CNA maintain safety in these patient care situations? First, the CNA must realize what the risks are and what a patient needs. These patients are at risk for: 1) changes in vital signs, 2) disorientation, and 3) falls and seizures.

Taking and monitoring patient vital signs is always part of a CNA's responsibility. For a patient who is suffering from alcohol withdrawal syndrome, elevated blood pressure, fever, and tachycardia are typical vital sign changes. A CNA should be especially vigilant in monitoring temperature. Agitation, increased metabolic rate, restlessness and increased body temperature are common symptoms. This adds a big level of stress and can also cause dehydration, so the patient's temperature should be checked frequently.

Disorientation in the patient is a difficult problem to manage. A patient who is going through alcohol withdrawal can be agitated, anxious, confused, and hallucinating. Patients who are disoriented will not take medications, they may pull out intravenous (IV) catheters, may wander, and may become physically aggressive. When someone is not oriented to time, place, or person there is significant danger.

There is no single approach to managing a disoriented patient. Physical restraints are used as a last resort, and physical restraints can

only be applied if their use has been ordered by a physician or approved by a supervisor. A CNA may need to be in constant attendance with a patient who is disoriented. Distraction and re-orientation to time, place, and the current surroundings are most helpful to calm the disoriented patient. Distraction can be in the form of simple activities, conversation, or watching television. Re-orientation to time, place, and surroundings - telling a patient, "It is Friday," or "You are in the hospital, and I am a CNA who is here to take care of you" - may need to be repeated multiple times during a shift.

A CNA does not have primary responsibility for preventing or treating seizures but the CNA should be aware that seizures can occur. Fall prevention is another consideration and is a familiar skill for CNAs which will not be covered here.

### **Complications and Supportive Care**

The primary complications associated with alcohol withdrawal syndrome are 1) abnormal vital signs, 2) dehydration, and 3) mental status changes and seizures.

In the initial stages of alcohol withdrawal syndrome, the patient may have a fever, and the pulse and blood pressure will definitely be elevated. These vital sign changes will also be seen in Stage 3 and Stage 4. However, patients who are in Stage 3 or Stage 4 may develop hypotension. Dehydration and the stress can lower blood pressure, and this change can be sudden. In either case, abnormal vital signs can be dangerous for patients who have pre-existing medical conditions such as heart disease, so temperature, pulse, and

blood pressure must be frequently checked. Fever would be treated with fluids, intravenous or oral, and acetaminophen or ibuprofen. Acetaminophen can be damaging to the liver. So, for patients with chronic alcohol use and existing liver damage, the lowest dose of acetaminophen that will be effective should be given. Elevations of pulse and blood pressure are usually treated with benzodiazepines such as Ativan® or Valium®.

Dehydration was previously mentioned, but it should be emphasized that this can be a serious problem. Many patients going through alcohol withdrawal syndrome are already dehydrated. The agitation, fever, increased metabolic rate, restlessness, sweating, and vomiting increase this level of dehydration and add a big degree of stress. Patients are at risk for electrolyte abnormalities and hypotension. Careful monitoring of the patient's fluid status and administering increased oral or intravenous fluids are the preferred treatments.

Seizures are not common, but they do occur. The first line treatment for seizures are benzodiazepines. The mental status changes commonly seen in patients who are going through alcohol withdrawal syndrome have been mentioned. Some of these such as agitation and anxiety are relatively benign, and others such as confusion, delirium, and hallucinations are potentially harmful but, in either case, these mental status changes are disturbing and uncomfortable for the patient. They can also lead to dangerous and disruptive behavior.

The most commonly used therapy for patients who are going through alcohol withdrawal syndrome and have altered mental status is benzodiazepines. These drugs are easy to administer, they are

relatively safe, and there is an antidote for benzodiazepine treatment that can be used if the dose is found to be too high and the patient is having side effects. As mentioned, the benzodiazepines are also the first-line treatment for seizures.

### **Case Study: Alcohol Withdrawal**

The following case study was obtained from a PubMed search and discusses the use of the CIWA-Ar protocol in a case of alcohol withdrawal. The authors reported on a 57-year-old male who arrived to the hospital early afternoon after falling while intoxicated.

The patient had evidence of moderate brain trauma from falling and his serum alcohol level remained moderately elevated by mid afternoon. There was an eyebrow laceration that was sutured. He also had a computed tomography (CT) scan of his head that revealed a small brain bleed. A neurosurgeon was consulted and the patient was kept in hospital for observation, and began to show signs of alcohol withdrawal. The CIWA-Ar protocol using lorazepam (ativan) was started later that evening with an initial score of 13.

By early morning, lorazepam 10 mg by mouth had been given and medical consultation was initiated. The patient's alcohol withdrawal worsened and diazepam (valium) was started to replace the lorazepam. By mid afternoon day 2 of the patient's hospitalization, diazepam 10 mg by mouth 3 times a day was added, and addiction medicine specialists were consulted and the patient was seen by them approximately 21 hours since starting the CIWA-Ar protocol. By then, the patient had received a total of lorazepam 18 mg orally and diazepam 40 mg intravenously in addition to diazepam 20 mg orally.

Signs of severe alcohol withdrawal continued that included agitation, sweating, high blood pressure, rapid heart rate, and tremor.

The authors reported that the patient was unable to speak in English, and only spoke Polish. A telephone translation service was briefly available, however the patient was confused and disoriented. There was little outside information available by family or outside medical records. Chronic liver disease was diagnosed with signs of poor oxygenation and hardness of the liver. Because the patient could not speak English, the CIWA-Ar protocol was stopped and the medication changed from diazepam to lorazepam 1 mg four times per day. This was done because lorazepam doesn't burden the liver as the diazepam does.

Another assessment scale called the objective alcohol withdrawal (OAW) scale was implemented that included more objective measures of the patient status and treatment based on the OAW scale. The patient's level of alcohol withdrawal was scored as follows:

Score 1 point for each of

- systolic blood pressure  $\geq$  160 mm Hg or diastolic blood pressure  $\geq$  90 mm Hg
- heart rate  $\geq$  90 beats/min
- tremor
- diaphoresis
- agitation
- If total  $\geq$  2 give 1 mg oral lorazepam (or 10 mg of diazepam)
- If total  $\geq$  3 give 2 mg oral lorazepam (or 20 mg of diazepam)



- Reassess every hour until score is  $< 2$  for 3 consecutive measures, then reassess every 6 hours for 24 hours, then every 24 hours for 72 hours, then discontinue

Using the OAW scale the patient's withdrawal symptoms improved and the lorazepam requirements were less. The patient remained hypertensive and required occasional dosing as needed, however by day 6 the lorazepam treatment was discontinued. The patient was able to discharge in stable condition on day 8.

### **Discussion**

The authors suggested that while the CIWA-Ar is the standard assessment tool for alcohol withdrawal syndrome at most hospitals, there is a subjective component that may be limiting such as in the case of this patient. Only 3 of 10 components (tremor, paroxysmal sweats, agitation) of the CIWA-AR can be rated by observation alone, and the other 7 components require patient discussion with the evaluator. When scores are unreliable, there is the potential of incorrect dosing of lorazepam and patient harm.

The authors stated there were 2 primary reasons why the CIWA-Ar was unreliable in this case. First, there was a substantial language barrier preventing the discussions necessary for accurate scoring; and, second, the patient was confused and disoriented, which was another barrier whether the patient spoke English or not. Acute medical issues and delirium can complicate the clinical scenario.

There are other issues that can minimize the effectiveness of the CIWA-AR scale in assessing patients with a history of chronic alcohol

use, such as a patient with acute psychosis, severe dementia, severe facial trauma limiting speech and vision, and for patients on a ventilator. An approach to treatment may be the use of another validated assessment tool for alcohol withdrawal syndrome that measures the patient's vital signs and movements. With any assessment tool, it's always important that the patient's individual situation be considered, such as tremors in a patient with Parkinson's disease should take into account the patient's underlying chronic condition.

It was suggested by the authors that for the patient in this case it was appropriate to liberally medicate the patient to avoid underdosing. In moderate withdrawal or where there was concern for benzodiazepine toxicity, less benzodiazepine use would be clinically appropriate. Assessment scales and medication for patients with an alcohol withdrawal syndrome should be tailored to fit individual cases of withdrawal severity and patient disease states, such as for hypertension, Parkinson's disease or a heart rhythm condition.

### **Summary**

Alcohol withdrawal syndrome happens when people who chronically use alcohol suddenly stop drinking. Chronic alcohol use causes changes in the activity of the neurotransmitters GABA and glutamate. These changes cause central nervous system depression. In response, the body increases the activity of the sympathetic nervous system, the part of the nervous system that increases blood pressure and heart rate and causes agitation and excitement. When the influence of alcohol is removed, the sympathetic stimulation remains and this causes the signs and symptoms of alcohol withdrawal syndrome;

agitation, confusion, hallucinations, fever, and elevated heart rate and blood pressure.

Alcohol withdrawal syndrome can last for days or more than a week. There is no cure. Alcohol withdrawal syndrome is associated with some serious complications such as hallucinations, hypotension, and seizures, and these patients require careful monitoring. The patients are treated with supportive care such as oral or intravenous fluids and benzodiazepines. Most patients will be very uncomfortable, but permanent harm and death can occur.

It is important for the patient's individual situation to be considered when choosing an alcohol withdrawal assessment tool and initiating treatment. While the CIWA-AR scale is commonly used to assess the severity of a patient's level of alcohol withdrawal, there are underlying conditions and social factors that can minimize the effectiveness of the CIWA-AR scale in patients with chronic alcohol use. An approach to treatment may be the use of another validated assessment tool for alcohol withdrawal syndrome with more objective measures of the patient's level of withdrawal.