Alcohol Withdrawal: Assessment and Symptom-Triggered Treatment

2016
Alcohol, or ethanol, is produced by the fermentation of yeast, sugars and starches. Yeast breaks sugar down into ethanol and carbon dioxide. Ethanol is water soluble and fat soluble, which means it enters into the blood stream and passes through cell membranes quickly.
Goals

- Reduce incidence of alcohol withdrawal syndrome in the hospital
- Reduce the incidence of withdrawal advancing to delirium tremens
- Reduce restraint use in patients experiencing withdrawal
- Decrease transfer to the ICU for patients experiencing withdrawal
- Decrease injury and hospital acquired infections/complications for patients in withdrawal
- Develop reliable and valid tool for use by nursing staff
- Develop symptom triggered treatment protocol that is effective and easy for staff to understand and use
Definitions

- **Alcohol Abuse**
  - May not fulfill family, work or school responsibilities but are not physically dependent on alcohol
- **Alcohol Dependence (Alcoholism)**
  - Characteristics
    - Craving: strong urge to drink
    - Loss of control: inability to stop drinking once begun
    - Physical dependence: withdrawal after stopping drinking
    - Alcohol tolerance: need greater amounts of alcohol to get “high”
    - Most common among those with family income of less than $25,000 per year
- **Alcohol Use Disorder (AUD): Alcohol abuse and/or dependence**
  - Combined now as medical conditions that doctors diagnose when a patient’s drinking causes distress or harm.
- **Binge Drinking**
  - Pattern of drinking that bring BAC to 0.08g/dL
  - 4 drinks for women and 5 drinks for men in a 2 hour time period
  - Associated with higher family incomes
- **Low risk drinking:** No more than 3 drinks per day or 7 in a week for women; no more than 4 drinks per day or more than 14 drinks in a week.
- **Heavy Drinking:** 5 or more drinks on the same occasion on each of 5 or more days in last 30 days
- **Alcohol Withdrawal**
  - Medical emergency
  - Symptoms experienced within 6-72 hours of last alcoholic drink due to adrenergic hypersensitivity of the limbic system and brain stem causing cellular irritability
  - Effects every system in the body
- **Teetotaler**
  - Abstains from alcohol
- **DSM-V Criteria for alcohol abuse or dependence is labeled AUD**
Epidemiology

- **Prevalence (snap shot)**
  - 86.8% of people older than 18 years of age reported they drank alcohol sometime in their lifetime (2013)
  - 24.6% of people reported they engaged in binge drinking over last month (2013)
  - 6.8% of people reported they engaged in heavy drinking in past month (2013)
  - 1.3 million adults received treatment for Alcohol Use Disorder in a specialized facility in 2013
  - 73,000 adolescents (12-17 yrs) received treatment for AUD in 2013
  - 88,000 people die from alcohol related causes annually
    - 3rd preventable cause of death in the US
    - Alcohol impaired driving fatalities accounted for 30.8% of all driving fatalities in 2013
  - Alcohol misuse cost the US $223.5 BILLION, most of which is related to binge drinking
  - More than 10% of US children live with a parent with alcohol problems

- **College Students and Alcohol**
  - 39% binge drink
  - 12.7% engage in heavy drinking
  - 696,000 assaults
  - 97,000 alcohol related sexual assaults/rapes
  - 20% meet criteria for AUD
  - 25% report academic consequences of drinking

- **Health related**
  - 46% of liver disease deaths involved alcohol
  - Alcohol related liver disease was primary cause of 1 in 3 liver transplants in 2009
  - Drinking increases the risk of cancers of mouth, esophagus, pharynx, larynx, liver and breast
Alcohol Use Disorder in Hospitalized Patient Population

- 1 in 5 patients (20%) admitted to hospital has alcohol use disorder (abuse or dependence)
- 1 in 4 (25%) admitted to a medical-surgical unit has AUD
- 7-22% of elderly patients admitted to hospital and 10-15% treated in ER have an alcohol abuse problem
  - Elderly are at higher risk for AWS
    - Longer drinking histories
    - Prior episodes of AWS
    - Co-morbidities
    - Take beta-blockers that mask AWS symptoms
    - Baseline cognitive disorders increase delirium risk
    - Use shorter-acting benzodiazepines
    - Increase risk of falls, prolonged sedation, functional deficits
    - Poor evidence for assessment tools and treatment protocols (not researched)
- Alcohol abuse in older adults is an epidemic and they tend to underreport use
- Screening for use and assessing for symptoms is an important intervention nurses can do for all patients
Pathophysiology

Inhibition (GABA)

Excitation (NMDA)

Alcohol Exposure

Chronic Alcohol Use

Alcohol Withdrawal
Neurotoxicity

- Kindling phenomenon
  - Concept in alcohol craving and withdrawal
  - Long term changes in the neurons after repeated detoxification
    - Neurons become increasingly sensitive to the up-regulation of neurotransmitters
  - Subsequent detox creates increased craving for alcohol and may cause withdrawal symptoms to progressively worsen/escalate
  - May be an important consideration in selecting medication
Signs and Symptoms

- Symptoms relate proportionally to the amount of alcohol intake and the duration of the drinking habit
- Most patients experience similar symptoms each time they withdraw
- Mild (6-12 hours)
  - May still have elevated blood alcohol level
  - Insomnia
  - Mild anxiety
  - Tremors
  - Visual, auditory, or tactile hallucinations with clear sensorium
  - Palpitations
  - Upset stomach
  - Mild sweating (palms)
- Moderate (12-24 hours)
  - Similar to mild symptoms more higher intensity
  - Sweating, tremors, hallucinations, agitation, hypertension, tachycardia, fever
- Severe
  - DTs (48-72 hours)
    - Mortality 1-5%
    - Risk factors: concurrent medical illness, daily heavy ETOH, history of DTs, older age, abnormal liver function, history of withdrawal seizures, severe AWD symptoms on arrival
    - Visual hallucinations, disorientation, tachycardia, HTN, fever, severe diaphoresis
    - Ketoacidosis and circulatory collapse may occur (increasing mortality up to 15-20%)
  - Seizure (24-48 hours): Generalized, tonic-clonic with short post-ictal phase. Not treated with dilantin
  - Combative
  - Delusional
Alcohol Withdrawal Syndromes

- Major Withdrawal (DT's)
  - Symptoms: confusion, hallucinosis
  - Timeline: 6-9 days

- Minor Withdrawal
  - Symptoms: tremors, irritability, insomnia
  - Timeline: 10-14 days

- Seizures
  - Timeline: 1-2 days

Maldonado et al, 2009
AWS Symptoms (Memory Aid)

HITS

- H – Hallucinations/Delirium
- I – Increased vital signs/Insomnia
- T – Tremors/anxiety
- S – Shaking, sweating, seizures, stomach pain (nausea & vomiting)
AWS Symptoms (Memory Aid): PASTNITE

- P: Psychomotor agitation
- A: Anxiety
- S: Seizures
- T: Transient Hallucinations
- N: Nausea/vomiting
- I: Insomnia
- T: Tremor (hand)
- E: Excitability/Adrenergic response—↑BP/HR
Complicating Comorbidities

- Seizures
- Intracranial Bleed
  - Subdural
  - Intraparynchemal/Subarachnoid
- Pneumonia or Respiratory Failure (intubation)
- Arrhythmias
  - Afib
  - SVT
  - Torsades de pointe
- Injuries (Falls)
- Trauma (MVA)
- GI Bleeding
- Electrolyte disturbances (Hypo K, Mg, Phos, hypoglycemia)
- Lactic acidosis
- Mortality
- Development of Chronic Disease
  - Cirrhosis (AST-ALT= 2:1; coagulopathies)
  - Pancreatitis
  - Cardiomyopathy
  - Wernicke’s Encephalopathy
  - Neuropathy/Myopathy
  - Renal disease
  - HIV
  - Hepatitis
Screening

- Prior to Surgery or Procedures
  - Can be done by phone prior to outpatient procedures
  - Should be assessed if emergent procedure on early admission to hospital
  - Consider postponing elective surgeries until patient without alcohol intake for 7-10 days

- On Admission
  - Many patients are presenting for other comorbidities
  - Other illnesses may mask alcohol withdrawal
  - Denial/minimiziation is a real issue
  - Should be part of data base and possible more in depth assessment triggered on 2\textsuperscript{nd} day of admission
  - Find out how long since last drink
What is a drink?

<table>
<thead>
<tr>
<th>One standard drink is...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half pint of regular beer or cider</td>
</tr>
<tr>
<td>1 small glass of wine</td>
</tr>
<tr>
<td>1 single measure of spirits</td>
</tr>
<tr>
<td>1 small glass of sherry</td>
</tr>
<tr>
<td>1 single measure of aperitifs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The following quantities of alcohol contain more than 1 standard drink</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Pint of Regular beer/lager/cider</td>
</tr>
</tbody>
</table>

= 425 mL Light beer = 285 mL Regular beer = 100 mL Wine = 60 mL Fortified Wine = 30 mL Spirits
Quick assessment

Olathe Medical Center Screening

**ALCOHOLISM SCREENING**

**“CAGE”**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCERN by the person that there is a problem</td>
<td>Have you ever felt that you should CUT down on your drinking?</td>
</tr>
<tr>
<td>APPARENT to others that there is a problem</td>
<td>Have you ever become ANNOYED by criticisms of your drinking?</td>
</tr>
<tr>
<td>GRAVE consequences</td>
<td>Have you ever felt GUILTY about your drinking?</td>
</tr>
<tr>
<td>EVIDENCE of dependence or tolerance</td>
<td>Have you ever had a morning EYE OPENER to get rid of a hangover?</td>
</tr>
</tbody>
</table>

**LEARN MORE: CAGE QUESTIONNAIRE**

CAGE questionnaire is a widely used and an extensively validated method of screening for alcoholism. Two “yes” responses indicate that the possibility of alcoholism should be investigated further.
# New Alcohol Withdrawal Assessment

<table>
<thead>
<tr>
<th>Metric</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature &gt; 100.5</td>
<td>1</td>
</tr>
<tr>
<td>Pulse</td>
<td></td>
</tr>
<tr>
<td>90-110</td>
<td>1</td>
</tr>
<tr>
<td>Greater than 110</td>
<td>2</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td></td>
</tr>
<tr>
<td>90-110</td>
<td>1</td>
</tr>
<tr>
<td>Greater than 110</td>
<td>2</td>
</tr>
<tr>
<td>Tremor (assess with arms extended and fingers apart)</td>
<td></td>
</tr>
<tr>
<td>Mild Tremor or only slightly visible</td>
<td>2</td>
</tr>
<tr>
<td>On movement with arms extended</td>
<td>4</td>
</tr>
<tr>
<td>At rest</td>
<td>6</td>
</tr>
<tr>
<td>Sweating</td>
<td></td>
</tr>
<tr>
<td>Barely/moist palms</td>
<td>2</td>
</tr>
<tr>
<td>Moist/Visible Beads of sweat</td>
<td>4</td>
</tr>
<tr>
<td>Drenching sweat</td>
<td>6</td>
</tr>
<tr>
<td>*Hallucinations (Tactile, auditory or visual)</td>
<td></td>
</tr>
<tr>
<td>Mild: Mostly lucid, sporadic or rare hallucinations</td>
<td>1</td>
</tr>
<tr>
<td>Moderate: Hallucinating at times in between conversations or when just waking up; Able to be reoriented</td>
<td>2</td>
</tr>
<tr>
<td>Severe: Continuous hallucinations while awake</td>
<td>3</td>
</tr>
<tr>
<td>*Orientation</td>
<td></td>
</tr>
<tr>
<td>Oriented X2</td>
<td>2</td>
</tr>
<tr>
<td>Oriented X1</td>
<td>4</td>
</tr>
<tr>
<td>Disoriented</td>
<td>6</td>
</tr>
<tr>
<td>*Delusions: Suspicious or paranoid; unfounded ideas</td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>6</td>
</tr>
<tr>
<td>Agitation (RASS)</td>
<td></td>
</tr>
<tr>
<td>+ 3 or greater: Very agitated or Combative</td>
<td>9</td>
</tr>
<tr>
<td>+2: Agitated</td>
<td>6</td>
</tr>
<tr>
<td>+1: Restless</td>
<td>3</td>
</tr>
<tr>
<td>-1: Drowsy</td>
<td>0</td>
</tr>
<tr>
<td>-2: Light sedation</td>
<td>-1</td>
</tr>
<tr>
<td>-3: Moderate sedation</td>
<td>-2</td>
</tr>
<tr>
<td>* If you cannot assess due to sedation, score 0 (do not give points if you cannot assess due to sedation)</td>
<td></td>
</tr>
<tr>
<td>Seizures Present currently</td>
<td>6</td>
</tr>
<tr>
<td>History of Seizures with previous withdrawal</td>
<td>2</td>
</tr>
</tbody>
</table>

**Interpretation of Scale:**

- **Reassess:** 0-4
- **Mild:** 5-14
- **Moderate:** 15-19
- **Severe:** >20
Alcohol Withdrawal Assessment Protocol

- Upon admission complete Alcohol withdrawal assessment
- Complete Alcohol withdrawal score assessment and Vital signs every 1 hour x 2
  - Then every 4 hours per symptom triggered guidelines.
- When Alcohol Withdrawal score is 5 or less for 3 consecutive checks, decrease assessment to every 8 hours.
- When Alcohol Withdrawal score is 5 or less for 3 consecutive 8 hour checks, discontinue alcohol withdrawal protocol.
- Delirium will be assessed using the Confusion Assessment Method (b-CAM).
Recommendations for Care

- Frequent assessment and reassessment
- Use tool to guide treatment
- Initiate fall and seizure precautions
- Assess for aspiration risk (DYSPHAGIA SCREEN)
- Provide non-judgmental, supportive, empathetic, and comprehensive emotional care when interacting with patient
- Airway and telemetry considerations
- Nutritional assessment, including dental assessment
- Review labs for electrolyte imbalances, liver levels, and signs of anemia
- Monitor mental status
- Assess for other psychiatric disorders (suicidal?)
- Begin discharge planning discussion earlier in light of alcohol use as a barrier to care (increased readmission risk)
- Assess patient’s readiness for treatment for AUD on discharge
Nutrition, dehydration and vitamin supplementation

- Patients who use alcohol chronically are at high risk for malnutrition, dehydration and vitamin deficiencies.
- Thiamine deficiency can progress to Wernicke encephalopathy (reversible delirium) or Korsakoff syndrome (irreversible dementia).
  - Screen for symptoms – a triad of ocular abnormalities, gait abnormalities and mental status changes.
  - Start thiamine IV 100 mg daily for 3 to 7 days in all AWS patients.
  - Increase thiamine to treatment dose 200-500 mg IV tid for several days if active Wernicke or Korsakoff syndromes are suspected.
  - Transition to po when able and continue thiamine daily for life if the patient continues consuming alcohol.
- Check electrolytes daily and replace as needed.
  - Several days of treatment may be needed in severe abnormalities.
  - Adequate magnesium is very important because it is the cofactor for the enzyme that converts thiamine to the active form used by the body.
- Volume depletion in alcoholics have been associated with delirium tremens (DTs) and death.
  - Volume resuscitate quickly. Normal saline IV at 100-125 ml/hr is standard per the OMC protocol.
  - CAUTION! Always give thiamine prior to any dextrose containing IVF because dextrose can exacerbate Wernike/Korsakoff syndrome. Thiamine deficiency impairs glucose metabolism in the brain.
- Additional vitamin supplementation is also beneficial due to common malnutrition associated with alcoholism
  - Multivitamin daily
  - Folic acid daily
  - “Banana bag” (thiamine, multivitamin, folic acid in 500 ml NS IV at 50 ml/hr) for 3 days is standard practice.
  - Transition to oral when the patient is tolerating oral intake and is cooperative.
Environmental/Emotional Support

- Reduce environmental stimuli
- Provide uninterrupted periods of rest
- Goal of care: calm and sleepy (RASS 0 to -1) but arousable.
- Avoid restraints if able – use can increase psychosis
- Limit visitors especially if they increase agitation
- Optimize pharmacological therapy to avoid CCU admission - exacerbates delirium and disrupts sleep
- Social services for discharge planning and treatment options
Pharmacological Treatment - Benzodiazepines

- Benzodiazepines remain the foundation of AWS treatment
- Benzodiazepines bind to the GABA receptor thereby enhancing the inhibitory effect of GABA
- No one agent is preferred over another.
- Dose equivalency:
  lorazepam 1mg = midazolam 2mg = diazepam 5mg
- Diazepam is long acting but has a fast onset (15 minutes IV). Redose every 15 minutes. Subsequent doses may not be needed once the patient’s symptoms are controlled. Dose stacking is minimized.
- Reduce dose by 50% in the elderly
- Lorazepam is safer in patients with hepatic impairment
- All benzodiazepine doses should be reduced in renal impairment.
Pharmacological Treatment - Phenobarbital

- Phenobarbital is a useful in AWS patients who are still experiencing severe symptoms despite large doses of benzodiazpine.
- Phenobarbital also binds to the GABA receptor but at a different site then benzos.
  - Attenuates benzodiazepine binding
  - May also inhibit NMDA receptors thus decreasing glutamate release and excitation.
- Initial dosing: 65 mg slow IV push (> 1 min) x1. May repeat in 30 minutes if no response.
- Onset 5 to 30 minutes. Duration 4 to 10 hours.
- Adverse effects: hypotension and respiratory depression. Not as much of concern if the patient is experiencing adrenergic symptoms.
- Higher doses of 130 mg may be used in the CCU.
Pharmacological Treatment - Antipsychotics

- Antipsychotics should only be used in AWS patients who are:
  - hallucinating (auditory/visual),
  - experiencing delirium
  - severe agitation that is unrelieved by benzos +/- phenobarb.
- Not first line treatment for AWS and are not effective as monotherapy for AWS.
- Haloperidol is available in multiple dosage forms (IV, IM, PO).
  - Dose 0.5 to 8 mg every 30-60 minutes until symptoms controlled.
  - Adverse effects: High risk for increased QTC (telemetry required for IV and increased risk with doses > 35 mg/day), EPS and sedation.
- Olanzepine (IM or PO) 5 to 10 mg every 2 to 4 hours prn
  - Adverse effects: Moderate risk for increased QTC, hypotension, EPS
- Quetiapine has been shown to have some benefit in alcohol and substance abuse treatment.
  - Alcohol can alter the architecture of normal sleep.
  - Starting dose 25 mg bid scheduled. May increase by 50 mg daily until desired response up to a max dose of 400 mg/day.
  - Adverse effects: Drowsiness (16-37%), headache, EPS. With chronic use: weight gain and increased lipids/triglycerides.
Pharmacological Treatment - Alpha agonists

- Adrenergic symptoms are often present in AWS due to NMDA activation and release of glutamate
- Clonidine for $\uparrow$BP and $\uparrow$HR at 0.1 to 0.2 mg po tid.
  - Hold for hypotension or bradycardia
  - Adverse effects: orthostatic hypotension and drowsiness
- Dexmedetomidine may be used in the CCU as conscious sedation
  - Intubation not required – no decrease in respiratory drive
  - Adverse effects: bradycardia and hypotension
  - Does not treat AWS – must be used in conjunction with a GABA agonist (benzo or phenobarb)
Pharmacologic Treatment – Propofol plus intubation

- Well studied in AWS
- Enhances GABA action and may decrease glutamate
- Depresses respiratory drive – intubation required
- No advantage over benzodiazepines
- Quick offset once drip is discontinued (minutes)
- Increased risk of seizure activity if no benzodiazepine on board
Refractory Alcohol Withdrawal (RAW)

- RAW can occur due to the kindling effect and benzodiazepine resistance
- Permanent brain changes affecting neurotransmitters
- Not relieved by changing benzodiazepine agents (saturation)
- Re-evaluate the patient every 15 to 30 minutes in the acute phase
- Adjunctive therapy often required to control symptoms (phenobarbital, haloperidol, clonidine or dexmedetomidine)
- Average number of agents = 3
- Transfer to CCU often needed for advanced medical management
- Intubation likely
- Average resolution of RAW = 6 days
- Increased CCU LOS (9 days on average) and hospital LOS (13 days)
- Goals of treatment: Calm, sleepy, normal heart rate, no hypertension or seizures
Case #1

Patient is a 51 year old man with hx of colon adenocarcinoma with localized intra-abdominal metastasis presents to ER with several days of blurred vision followed by confusion and lethargy. Previous hospital stays for ileus and failure to thrive over last 6 months. His family reports his use of alcohol. He has had poor nutritional intake, disoriented to time and place but oriented only to self, horizontal and vertical gaze nystagmus, sensory loss and diminished patellar reflexes. 18 hours into his stay he begins complaining of “bugs crawling on him”, talking to a girl who is not there, and refuses to eat because “someone is poisoning him”. He has newly developed atrial fibrillation with rates of 120-130 and BP is now 160-180/ 100-110. He is restless and trying to get out of bed often to try to “pee” even though he is extremely weak.
Assessment & Treatment per new protocol

Assessment Score:
• Oriented x1: 4
• Pulse: 2
• DBP: 2
• Hallucinations: 3
• Delusions: 6
• Restless: 3
• Total score: 21 = Severe

Treatment per Protocol:
• Phenobarbital 65mg IV once. Clonidine 0.1mg po for BP. Reevaluate in 15 minutes.
• Consider asking for support and ongoing plan of care from floor pharmacist or ICU RN.
• IF patient situation continues to deteriorate consider calling MRT and transfer to higher level of care.
Case #2

The patient is a 43 year old female, direct admit from Dr. office admitted to med-surg for GI bleed with joint pain, black tarry stools and decreased H/H. Labs include an ETOH level .11. Past medical history of Hep C, HTN and right total humeral prosthesis. Vitals: HR 118, RR 22, BP 182/99. By day 2, tremors are prominent at rest, she begins hallucinating continuously while awake, agitated and combative requiring security to be called and 4 point restraints to be placed after attempting to bite the security guard. Delirium assessment with bCam is positive.
Assessment & Treatment per new Protocol

Assessment Score:
- Pulse : 2
- DBP: 1
- Tremor: 6
- Hallucinations: 3
- RASS: 9
- Total 21 = Severe

Treatment per Protocol:
- Phenobarbital 65mg IV once.
- Haloperidol 4mg IM.
- Reevaluate in 15 min.
- Transfer to ICU due to 4-point restraint placement.
Questions

1. Heavy Drinking is defined as having 5 or more drinks on the same occasion on each of 5 or more days in the last 30 days.
   a. True
   b. False

2. Repeated episodes can make alcohol withdrawal worse because of the kindling phenomenon.
   a. True
   b. False
Questions

3. Screening for alcohol use prior to procedures or on admission is an important piece of preventing complications of alcohol withdrawal while in the hospital.
   a. True
   b. False

4. What percentage of patient admitted to the hospital have alcohol dependence and are at risk for withdrawal?
   a. 10%
   b. 20%
   c. 50%
   d. 5%
Questions

5. AWS symptoms are best managed by frequent monitoring and aggressive treatment with benzodiazepines until symptoms are controlled. Which benzodiazepine has the quickest onset but longest duration of action thereby allowing the RN to re-dose every 15 minutes prn until desired result?

a. Alprazolam
b. Diazepam
c. Lorazepam
d. Midazolam
Questions

6. Your patient is experiencing severe symptoms of AWS that include hitting, kicking and jumping out of bed. You have given several doses of a benzodiazepine. Pulse is 114. BP 145/105. You assess the patient at a score > 20. You are concerned for both your safety and the patient’s safety. Your next step per the protocol is:

   a. Give more benzodiazepine
   b. Give clonidine
   c. Give haloperidol
   d. Give phenobarbital