



EM CASES SUMMARY

Episode 87 – Alcohol Withdrawal & Delirium Tremens

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Alcohol withdrawal is everywhere. We see over half a million patients in US ED's for alcohol withdrawal every year. Despite these huge volumes of patients and the diagnosis of alcohol withdrawal seeming relatively straightforward, it's actually missed more often than we'd like to admit, being confused with things like drug intoxication or sepsis - or it's not even on our radar when an older patient presents with delirium. The differential diagnosis is enormous - and no blood test on the planet will help us diagnose alcohol withdrawal. In fact, the diagnosis is entirely a clinical one. What's even more surprising is that even if we do nail the diagnosis, observational studies show that, in general, alcohol withdrawal is poorly treated. There's several reasons for our all too often mismanagement of these patients: few EDs have a standardized approach (or training of an approach) to the management of alcohol withdrawal, there's unfortunately still a bit of a stigma associated with alcoholism in many EDs which may contribute a kind of indifference to these patients by ED staff, and the medications used to treat alcohol withdrawal are often dosed incorrectly. So what if alcohol withdrawal is missed or poorly treated? Well, mismanaged alcohol withdrawal can be fatal - and untreated severe withdrawal often ends up with your patient seizing, or maybe a progression to delirium tremens.

General Approach to the Management of Patients with Alcohol Withdrawal

The ideal management of alcohol withdrawal involves 4 steps:

1. Identify which patients actually have alcohol withdrawal and require treatment
2. Use a standardized, symptom guided approach to assess symptom severity and guide treatment
3. Ensure that patients are fully treated prior to ED discharge
4. Provide a pathway to support patients who are trying to quit

Step 1: Identify which patients actually have alcohol withdrawal and require treatment.

Alcohol withdrawal is a clinical diagnosis and a diagnosis of exclusion. Patients with alcohol withdrawal often have a characteristic tremor, which is an intention tremor: at rest there is no tremor, but when you ask the patient to extend their hands or arms you will see a fine motor tremor (typically 7-12Hz) that is constant and does not fatigue with time. Other symptoms associated with alcohol withdrawal include: gastrointestinal upset, anxiety, nausea/vomiting, diaphoresis, tachycardia, hypertension and headache.

PEARL: A tongue tremor (as in this video) is difficult to feign and is a more sensitive sign of alcoholic tremor than hand tremor

Step 2: Use a standardized, symptom-guided approach to assess symptom severity and guide treatment

Protocols for treating alcohol withdrawal standardize care, they ensure clinicians identify the appropriate symptoms and monitor treatment. Protocols for alcohol withdrawal have been shown to improve the quality and consistency of care patients receive.

The CIWA protocol is a 10-item scale. It has been well validated in patients with alcohol withdrawal, but cannot be used for patients with delirium tremens. The CIWA calls for patients to be assessed hourly, and treated if the total score is 10 or greater. Patients should be reassessed hourly until there are 2 sequential scores < 10, after which they may be considered for discharge.

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

Nausea and Vomiting

- 0 – No nausea or vomiting
- 1
- 2
- 3
- 4 – Intermittent nausea with dry heaves
- 5
- 6
- 7 – Constant nausea, frequent dry heaves and vomiting

Paroxysmal Sweats

- 0 – No sweat visible
- 1 – Barely perceptible sweating, palms moist
- 2
- 3
- 4 – Beads of sweat obvious on forehead
- 5
- 6
- 7 – Drenching sweats

Agitation

- 0 – Normal activity
- 1 – Somewhat more than normal activity
- 2
- 3
- 4 – Moderate fidgety and restless
- 5
- 6
- 7 – Paces back and forth during most of the interview or constantly thrashes about

Visual Disturbances

- 0 – Not present
- 1 – Very mild photosensitivity
- 2 – Mild photosensitivity
- 3 – Moderate photosensitivity
- 4 – Moderately severe visual hallucinations
- 5 – Severe visual hallucinations
- 6 – Extreme severe visual hallucinations
- 7 – Continuous visual hallucinations

Tremor

- 0 – No tremor
- 1 – Not visible, but can be felt at finger tips
- 2
- 3
- 4 – Moderate when patient's hands extended
- 5
- 6
- 7 – Severe, even with arms not extended

Tactile Disturbances

- 0 – None
- 1 – Very mild paraesthesias
- 2 – Mild paraesthesias
- 3 – Moderate paraesthesias
- 4 – Moderately severe hallucinations
- 5 – Severe hallucinations
- 6 – Extremely severe hallucinations
- 7 – Continuous hallucinations

Headache

- 0 – Not present
- 1 – Very mild
- 2 – Mild
- 3 – Moderate
- 4 – Moderately severe
- 5 – Severe
- 6 – Very severe
- 7 – Extremely severe

Auditory Disturbances

- 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

Orientation and Clouding of the Sensorium

- 0 – Oriented and can do serial additions
- 1 – Cannot do serial additions
- 2 – Disoriented for date but not more than 2 calendar days
- 3 – Disoriented for date by more than 2 calendar days
- 4 – Disoriented for place/person

Cumulative scoring

Cumulative score	Approach
0 – 8	No medication needed
9 – 14	Medication is optional
15 – 20	Definitely needs medication
>20	Increased risk of complications

The SHOT protocol is a shorter protocol that has recently been developed, which may be easier to implement in the ED. It is a 4-item scale (Sweating, Hallucinations, Orientation and Tremor) that correlated well with the CIWA protocol and takes ~ 1 minute to apply. The SHOT protocol has not yet been validated.

*Sweating	0 - No sweating visible 1 - Palms moderately moist 2 - Beads of sweat visible on forehead
Hallucinations: "Are you feeling, seeing, or hearing anything that is disturbing to you? Are you seeing or hearing things you know are not there?"	0 - No hallucinations 1 - Tactile hallucinations only 2 - Visual and/or auditory hallucinations
Orientation: "What is the date, month, and year? Where are you? Who am I?"	0 - Oriented 1 - Disoriented for date by 1 month or more 2 - Disoriented to place or person
Tremor: Arms extended. Reach for object. Optional: walk across hall	0 - No tremor 1 - Minimally visible tremor 2 - Mild 3 - Moderate 4 - Severe

Step 3: Ensure that patients are fully treated prior to ED discharge. Observational studies show that patients are often either undertreated resulting in complications of alcohol withdrawal such as seizures and delirium tremens, or oversedated leading to prolonged length of stay and airway complications. If a patient has two sequential CIWA scores < 10 that are two hours apart, and there are no concerning risks for deterioration, consider discharging the patient from the ED. The patient's tremor should be minimal or resolved before discharge regardless of the CIWA score.

Pitfall: Patients with a CIWA score <10 yet still have a severe alcohol withdrawal tremor are at risk of complications of alcohol withdrawal if discharged from the ED.

The CIWA-Ar is only intended to allow one to assess withdrawal severity once you have made the diagnosis. It is not a diagnostic test for withdrawal.

It is strongly discouraged that patients be provided a take-away supply or prescriptions for benzodiazepines. The long half-life of diazepam will protect patients from developing serious symptoms of withdrawal, and

if adequately treated in the ED, no additional medications will be required.

Pitfall: Patients who are discharged from the ED with a prescription for benzodiazepines are at risk for sedative overdose, drug seeking behaviour and drug dependence.

Step 4: Provide a pathway to support patients who are trying to quit. Most patients in the ED with alcohol withdrawal are there to seek help. They are in a vulnerable state and may be ready to quit drinking. This is an opportune time for them to take the first steps on the pathway to recovery. Dr. Kahan recommends telling all ED patients who you have treated for alcohol withdrawal the following to maximize their chances of seeking help.

1. You need help for your serious alcohol problem
2. You can't do it on your own
3. There are effective treatments available to you
4. With treatment the way you feel, your mood, social relationships and work will be profoundly better
5. Provide several options to the patient, if available (i.e., AA, local treatment programs).

Timing of Alcohol Withdrawal

Symptoms from alcohol withdrawal usually start within 6-8 hours after the blood alcohol level decreases, peak at 72 hours, and diminish by days 5 to 7 of abstinence. Delirium Tremens can occur anytime from 3 to 12 days after abstinence.

Patients who are severely dependent on alcohol become tolerant to alcohol and their nervous systems have been reset to compensate for the sedating effects of alcohol. The likelihood of developing withdrawal is dependent on the usual amount consumed and the duration of

consumption. Therefore, patients who consume large amounts of alcohol on regular basis are more likely to develop withdrawal requiring pharmacologic management compared to those who binge sporadically.

Investigations for Patients with Alcohol Withdrawal

Ethanol Level in patients with alcohol withdrawal

A serum ethanol level should be considered only if the history is inconsistent or you are unsure of the diagnosis. Even then, there is no single ethanol level at which withdrawal is impossible. Chronic alcohol users may experience alcohol withdrawal at serum ethanol levels that are intoxicating to the naïve drinker.

Laboratory Measures in patients with alcohol withdrawal

In mild cases of withdrawal, blood work is not helpful and is unlikely to change management. However, in patients with severe alcohol withdrawal, especially patients with delirium tremens, blood work can help rule out other causes of delirium, and screen for alcoholic ketoacidosis and electrolyte abnormalities.

ECG in patients with alcohol withdrawal

There is some evidence to suggest that patients in severe alcohol withdrawal are at risk for prolonged QT which may be at least partially are result of the associated electrolyte abnormality such as hypomagnesemia. Consider a baseline ECG in patients who require admission for alcohol withdrawal.

Urine Drug Screen in alcohol withdrawal

A urine drug screen rarely changes management if there are no signs of co-ingestions. In a patient suspected to be in alcohol withdrawal who

has delirium, or you suspect a concurrent toxidrome, a urine drug screen may be helpful.

Differential Diagnosis

First, some patients with alcohol intoxication can have some of the signs of alcohol withdrawal (tachycardia, elevated BP, diaphoresis, agitation), and assuming that they are in withdrawal and giving them high doses of benzodiazepines can lead to complications of oversedation. So be sure examine for tremor carefully. If they don't have a real withdrawal tremor then they are probably drunk and not in withdrawal.

Pitfall: Some patients with alcohol intoxication can have some of the signs of alcohol withdrawal (tachycardia, elevated BP, diaphoresis, agitation), and assuming that they are in withdrawal and giving them high doses of benzodiazepines can lead to complications of oversedation.

Next, it is important to complete a neurological exam and look for any signs of head injury in patients with alcohol intoxication or withdrawal. Patients with a history of alcohol abuse are at a higher risk for head injury and intracranial hemorrhage as many of them have coagulopathies related to liver disease and fragile intracranial bridging veins from cerebral atrophy. Have a low threshold to obtain a CT head to rule out a bleed if there are signs or suspicion of a head injury. In patients who are suffering from delirium, keep a broad differential diagnosis including infection, other toxidromes (sympathomimetics, anticholinergics, toxic alcohols), serotonin syndrome, NMS, hypertensive crisis, acute pain and thyrotoxicosis.

Pharmacologic Treatment of Patients with Alcohol Withdrawal

Benzodiazepines for Alcohol Withdrawal

The first line medication for treating patients with alcohol withdrawal is benzodiazepines. The drug of choice is diazepam because it has a long half-life of ~100 hours, and carries a decreased risk of developing serious withdrawal symptoms once the patient is discharged. Diazepam also has a faster onset of action than lorazepam. Diazepam should be avoided in patients with overt liver failure or a history of liver failure. The half life of lorazepam is ~8-12 hours, which puts patients at risk of developing withdrawal symptoms once the patient is discharged and the lorazepam has worn off. However, lorazepam should be considered if there is evidence of significant liver dysfunction. If patients are encephalopathic or pre-encephalopathic lower the dose and titrate medications slowly.

Use oral benzodiazepines in stable patients with mild withdrawal who are not vomiting. Use IV benzodiazepines allowing faster onset and easier titration in patients with severe withdrawal as these patients are at a higher risk of seizure.

Dosing of Benzodiazepines in Alcohol Withdrawal

Dose benzodiazepines according to the severity of the alcohol withdrawal:

CIWA Score	Severity	Treatment
< 10	Mild	No treatment
10-20	Moderate	Diazepam 5-10 mg po and assess response
> 20	Severe	Diazepam 10-20 mg IV and assess response

Another protocol to consider for patients with severe withdrawal is to give a first dose of diazepam 10mg IV, and repeat in 5 minutes if the response is not adequate. Then double the dose to 20 mg and continue with 20mg, 30mg, 30mg, 40mg, 40mg every 5 minutes as needed.

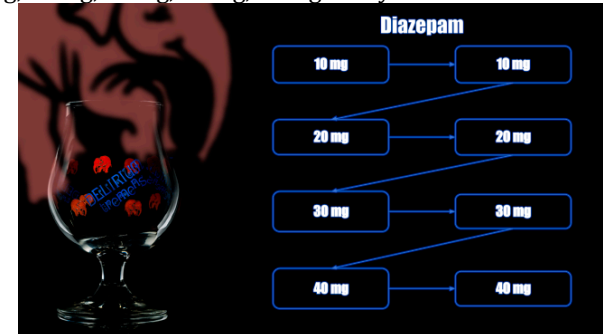


Fig 1. Example protocol for severe withdrawal (from First 10EM)

Phenobarbital for Treatment of Alcohol Withdrawal

There is no evidence that phenobarbital is better than benzodiazepines for alcohol withdrawal. There is debate regarding the equivalency of phenobarbital and benzodiazepines. Our experts do not recommend using phenobarbital alone for treatment of alcohol withdrawal, but may consider its use as an adjunct with benzodiazepines after large amounts of benzodiazepines have been used.

Thiamine

Often patients with alcohol withdrawal will receive 100 mg of thiamine. If there is concern of Wernicke's encephalopathy (nystagmus, ataxia, confusion), higher doses of thiamine are used (i.e. 500 mg IV q8h).

Fluids

Patients with alcohol withdrawal are almost always hypovolemic, many of these patients are also hypoglycemic. These patients should receive glucose-containing fluids. Glucose and thiamine compete for the same

co-factor, therefore, there is a theoretical risk that giving glucose in a thiamine deficient patient can precipitate Wernicke's encephalopathy. However, there is no evidence that one dose of glucose in a thiamine-deficient patient will precipitate Wernicke's. If you give glucose, give it at the same time or after thiamine – but urgent glucose should not be delayed for thiamine administration.

Severe Alcohol Withdrawal

In the agitated and disorientated patient with alcohol withdrawal, avoid antipsychotics such as Haldol because these drugs can prolong the QT interval and reduce the seizure threshold.

Consider intubation in patients who have airway concerns or who have refractory seizures, and may require adjunctive treatments. There are several adjunct medications that can be considered for refractory cases of severe alcohol withdrawal that are not responding to large doses of benzodiazepines. These are usually started in ICU patients. In the intubated patient, consider propofol, phenobarbital, dexmedetomidine and ketamine.

Suggested ICU admission criteria:

- Underlying medical or surgical condition that requires ICU-level care
- Requires second line therapy to control withdrawal (benzodiazepine resistant withdrawal)
- Hyperthermia
- Recurrent seizures
- Severe altered mental status

Drug	Dose	Mechanism of Action	Monitoring
Phenobarbital	130 - 260mg IV q20min OR 10mg/kg IV over 1hr	GABA Agonist	Hypotension Respiratory Depression Bradycardia Thrombophlebitis
Propofol	5 - 80mcg/kg/min IV(Intubated) OR 5 - 25mcg/kg/min IV (Non-intubated with EtCO2)	GABA Agonist & NMDA Receptor Antagonist	Hypotension Respiratory Depression Bradycardia
Dexmedetomidine	0.2 - 1.4 mcg/kg/hr IV	Alpha2 Agonist with Sedative Properties	Hypotension Bradycardia Respiratory Depression
Ketamine	0.2mg/kg/hr IV	NMDA Antagonist	Hypertension Tachycardia Sialorrhea Emergence Reactions Laryngospasm

Fig 2. Adjunct medications for refractory alcohol withdrawal symptoms (from REBEL EM)

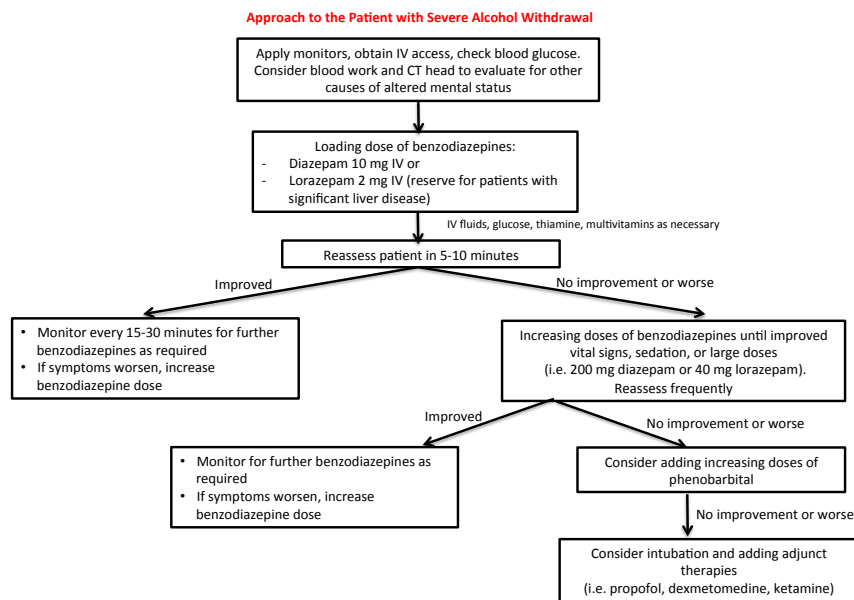


Fig 3. Suggested algorithm for severe alcohol withdrawal

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