BMJ Best Practice

Alcohol withdrawal

Straight to the point of care

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Summary

Alcohol withdrawal (acute or imminent) should be suspected in any patient who is alcohol-dependent and has stopped or reduced their alcohol intake within hours or days of presentation.[1] [2] [3]

Common symptoms are anxiety, nausea or vomiting, autonomic dysfunction, and insomnia.[1] [2] [3] These may progress to severe withdrawal with seizures, and alcohol withdrawal delirium.[1] [2] [3]

Identify any patient with features of severe alcohol withdrawal early. These patients need urgent treatment. Involve senior support and critical care. Alcohol withdrawal delirium is a life-threatening medical emergency requiring urgent treatment with a benzodiazepine. Patients having seizures also need urgent treatment with a benzodiazepine to reduce the likelihood of further seizures.

Not all patients with symptoms of alcohol withdrawal will need acute drug treatment; those with mild to moderate alcohol withdrawal symptoms can generally be managed with supportive care only.[3] Start a benzodiazepine regimen (fixed-dose or symptom-triggered depending on the clinical setting) for any patient needing acute drug treatment.[1] [2]

Definition

Alcohol withdrawal occurs in patients who are alcohol-dependent and who have stopped or reduced their alcohol intake within hours or days of presentation.[1] [2] [3] Symptoms typically begin 6 to 24 hours after the patient's last alcoholic drink, and may progress to life-threatening alcohol withdrawal delirium (also known as delirium tremens), with or without seizures.[2][4] [5] [6] [7]

Epidemiology

The World Health Organization estimates that 43% of the world population consumes alcohol, with 18.2% of drinkers aged over 15 years engaging in heavy episodic alcohol consumption.[11] In 2016, the global prevalence of alcohol-use disorders, defined as harmful use of alcohol or alcohol dependence, was 5.1% among drinkers aged over 15 years.[11]

Hazardous and harmful drinking are commonly encountered among people attending hospital.[1] In the UK, approximately 20% of patients admitted to hospital for illnesses unrelated to alcohol are drinking at potentially hazardous levels.[12]

Up to 25% of people in alcohol withdrawal experience hallucinations, while seizures occur in 10% of patients.[13] If alcohol withdrawal is not treated or is inadequately treated, 5% of patients will progress to alcohol withdrawal delirium (also known as delirium tremens), typically 48 to 72 hours after the last drink.[9] [14] [15] Alcohol withdrawal delirium-related mortality is less than 1% if early and appropriate treatment is given.[9]

Risk factors

Strong

history of alcohol withdrawal syndrome (AWS) and alcohol withdrawal delirium

Prior AWS and alcohol withdrawal delirium (also known as delirium tremens) reliably predicts the course of subsequent episodes.[31]

abrupt withdrawal of alcohol

Suspect acute or imminent alcohol withdrawal in any patient who is alcohol-dependent and has stopped or reduced their alcohol intake within hours or days of presentation.[1] [2] [3]

Aetiology

Alcohol withdrawal syndrome (AWS) is caused by abstinence from alcohol in a person with alcohol dependence.[16] It is characterised by signs of overactivity of the sympathetic nervous system.[17]

Chronic alcohol use results in up-regulation of post-synaptic N-methyl-D-aspartate (NMDA) receptors and down-regulation of post-synaptic gamma-aminobutyric acid (GABA) receptors. A decrease in blood ethanol concentration due to abrupt cessation in alcohol consumption results in an imbalance between stimulatory (NMDA) and inhibitory (GABA) systems in the central nervous system. Excessive stimulatory effect leads to the development of the clinical signs and symptoms of AWS.[13] [18] [19] [20] [21]

Pathophysiology

Ethanol interacts with two major receptors in the central nervous system (CNS) that are essential for normal CNS function: gamma-aminobutyric acid (GABA) type A receptors and N-methyl-D-aspartate (NMDA) receptors.

Ethanol predominantly targets the GABA type A receptor, where the persistent stimulation of inhibitory receptors results in downregulation of the GABA type A receptor/Cl- channel complex.[18] [19] [20] [21] The adaptive downregulation of GABA type A receptors also contributes to the development of tolerance by allowing alcohol users to maintain a level of consciousness despite the presence of a sedative ethanol concentration.[20] [21]

Among numerous different excitatory amino acid receptor systems, the presence of a persistent blood ethanol concentration primarily affects the expression of the post-synaptic NMDA receptor-Ca+2 channel complex. In contrast to GABA type A receptor agonism, ethanol inhibits the NMDA receptor function by competitively binding to the glycine binding site on the NMDA receptor. This inhibitory effect causes a compensatory upregulation of NMDA receptors on the post-synaptic membrane.

At the pre-synaptic level, chronic alcohol use increases excitatory glutamate release while re-uptake of glutamate is inhibited.[19] [21] [22] [23] There is evidence to suggest that acute alcohol use increases pre-synaptic GABA release.[19] [21] [24] [25] However, the relationship between chronic alcohol use and alteration of pre-synaptic release of GABA is currently not well understood.

Adaptive mechanisms in neurotransmitter-receptor interaction maintain homeostasis between excitatory (NMDA) and inhibitory (GABA) receptor systems and mediate the development of alcohol tolerance. Abstinence from alcohol in the alcohol-dependent patient leads to a disequilibrium between NMDA and GABA type A receptor function due to decreased blood ethanol concentration from the previously maintained steady-state level. As a result, excessive glutamatergic stimulation with diminished inhibitory (GABA) activity leads to the development of clinical symptoms of alcohol withdrawal syndrome (AWS), including autonomic hyperactivity, tremors, hallucinations, and seizures.[21]

Multiple episodes of AWS increase the severity of subsequent AWS due to kindling phenomena. Kindling is a process where low chemical or electrical stimulus, which does not normally produce a behavioural response, results in behavioural effects, such as seizure, from repetitive administration.[26] [27] There is a growing body of evidence that kindling phenomena contribute to the exacerbation of withdrawal symptoms.[26] Clinically, a significant proportion of patients with AWS who suffer seizures have a history of multiple episodes of AWS compared with patients with AWS who do not have associated seizures.[28] [29] [30]

Case history

Case history #1

A 45-year-old man presents to the emergency department with restlessness and tremors. He is anxious and pacing in the hallway. Initial vital signs show a heart rate of 121 beats per minute and blood pressure of 169/104 mmHg; other vital signs are normal. On further questioning by the nurse he states that he is nauseous and wants something to help with 'the shakes'. During the consultation the patient admits to heavy alcohol use and that he is trying to cut down on drinking. He also says that his current symptoms started to develop about 6 hours after his last drink.

Other presentations

Common symptoms of alcohol withdrawal include anxiety, nausea or vomiting, autonomic dysfunction, and insomnia.[1] [2] [3]

Mild to moderate withdrawal symptoms may start as early as 6 to 24 hours after the patient's last alcoholic drink, and peak at 24 to 36 hours.[2][4] [5] [7] Alcohol withdrawal delirium (also known as delirium tremens) is a life-threatening feature of severe alcohol withdrawal and generally occurs 48 to 72 hours after the last alcoholic drink, and peaks at 5 days.[7] Alcohol withdrawal delirium is characterised by hallucinations, delusions, profound confusion and delirium, coarse tremor, and features of clinical instability.[8] [9] [10] Alcohol withdrawal seizures are also a feature of severe withdrawal, and normally occur in the first 12 to 24 hours after the last alcoholic drink.[10]

Recommendations

Urgent

Identify any patient with features of severe alcohol withdrawal early. These patients need urgent treatment.

- Involve senior support and consider referring the patient to **critical care**. Always give intravenous or high-dose benzodiazepines in a critical care environment.
- In any patient who is alcohol-dependent and has stopped or reduced their alcohol intake within hours or days of presentation, look for at least one of:[1] [2] [3]
    - **Alcohol withdrawal delirium** (also known as delirium tremens)
        - This is a medical emergency.
            - Alcohol withdrawal delirium is fatal in 15% to 20% of patients if untreated.[34] [35] Appropriate early management reduces mortality to around 1%.[9]
        - Assess for hallucinations, delusions, profound confusion and delirium, coarse tremor, or features of clinical instability that start 48 to 72 hours after the patient's last alcoholic drink.[1] [2] [3] [7]
        - Give oral lorazepam or diazepam as first line if tolerated. Switch to intravenous lorazepam if symptoms persist. Add an antipsychotic if the patient fails to improve despite adequate treatment with intravenous lorazepam.
        - The patient may require phenobarbital and rapid tranquilisation for persistent symptoms.
    - A high or worsening CIWA-Ar ([Clinical Institute Withdrawal Assessment of Alcohol, revised]) or GMAWS ([Glasgow Modified Alcohol Withdrawal Scale]) score
        - Refer to local protocols for advice on which validated scoring system to use, with your clinical judgement, to assess severity of withdrawal.[1] [2] [3]
    - Failure to improve after two doses of a benzodiazepine
    - **Alcohol withdrawal seizure** [1] [2] [3]
        - Look for generalised tonic-clonic seizures.
        - Ensure a patent airway immediately.
        - Give intravenous lorazepam to control seizures.
    - Deranged temperature or deranged blood pressure or deranged blood glucose, alongside any feature of alcohol withdrawal.
- **Rule out other causes** such as head injury or central nervous system infection.
    - Request a CT head in any patient with suspected significant head injury or altered mental status, or who has had a seizure.[36] [37] [38] [39] [40]
- Assess mental capacity early.
    - Consult local protocols and involve senior support in patients who lack capacity.

- These patients are at high risk of absconding and causing harm to themselves.

Key Recommendations

Suspect acute or imminent alcohol withdrawal in any patient who is alcohol-dependent and has **stopped or reduced** their alcohol intake within **hours or days** of presentation.[1] [2] [3]

Clinical presentation

Symptoms vary according to severity. Common symptoms include [1] [2] [3] [7][41]

- Anxiety
- Nausea and vomiting
- Autonomic dysfunction
  - Tremor
  - Tachycardia
  - Sweating
  - Palpitations
- Insomnia.

Screen for alcohol-use disorder and alcohol dependence

Use a formal screening tool, such as AUDIT-C ([Alcohol Use Disorders Identification Test - Consumption]), FAST ([Fast Alcohol Screening Test]), or PAT ([Paddington Alcohol Test 2011]), to screen patients for alcohol-use disorder. The full AUDIT ([Alcohol Use Disorders Identification Test]) may also be used, but it takes longer to perform and therefore may not be suitable in an acute hospital setting.[2]

Identify patients at risk of alcohol withdrawal by assessing the level of alcohol dependence of patients who have tested positive for alcohol-use disorder.[2]

- Use a formal screening tool such as SAD-Q ([Severity of Alcohol Dependence Questionnaire]) or CAGE.
  - If using CAGE, ask four questions:[42]
    - C: Have you felt the need to cut down on your drinking?
    - A: Have you ever felt annoyed by someone criticising your drinking?
    - G: Have you ever felt bad or guilty about your drinking?
    - E: Have you ever had an eye-opener - a drink first thing in the morning to steady your nerves?

History

Ask about the subjective features of alcohol withdrawal. These include:

- Anxiety
- Nausea
- Insomnia
- Headache
- Tactile, visual, and auditory disturbances
- Blackouts, unexplained loss of consciousness, or seizures.

Assess cognition.[9] [10]

- Assess orientation to time, person, and place.

Ask about other current substance misuse and other medical comorbidities, including a psychiatric and social history.[1]

- Identify the reason for cessation or reduction of alcohol intake.

Ask about risk factors for hepatitis B, hepatitis C, and HIV infection.

- These can co-exist with or complicate alcohol withdrawal.

Physical examination

Assess for signs of alcohol withdrawal including a tremor.[1] [2] [3]

Look for signs of **Wernicke's encephalopathy.** These include nystagmus, ataxia, and confusion. See our topic *Wernicke's encephalopathy*.

Look for signs of **head injury**. See our topic *Assessment of traumatic brain injury, acute*.

Investigations

Alcohol withdrawal is a clinical diagnosis. However, use test results to help add weight to a suspicion of alcohol-use disorder.[1] [2] [3]

Always order:

- Venous blood gas
- Blood glucose
- Full blood count
- Urea and electrolytes including magnesium and phosphate
- Liver function tests including gamma-glutamyl transpeptidase (GGT)
- Bone profile
- Coagulation studies.

Always interpret test results in the context of the patient's clinical history and other findings.

It is important to rule out significant concurrent physical illness that may have led to a reduction in alcohol intake.[2]

Consider additional tests based on individual presentations and to rule out other causes.

Full Recommendations

Clinical presentation

Suspect acute or imminent alcohol withdrawal in any patient who is alcohol-dependent and has **stopped or reduced** their alcohol intake within **hours or days** of presentation.[1] [2] [3]

Ask when the patient's last drink was to determine the onset of timing of their symptoms.

- Mild to moderate symptoms tend to start 6 to 12 hours after the patient's last alcoholic drink and peak between 24 and 36 hours.[2][4] [5] [7]
- **Alcohol withdrawal delirium** tends to start **48 to 72 hours** after the patient's last alcoholic drink and peaks at 5 days.[1] [2] [3] [7]
- Alcohol withdrawal seizures tend to occur in the first 12 to 24 hours.[10]

Be aware that patients may present in different ways, including:[43]

- In acute withdrawal
- After presenting for another reason
    - Alcohol-use disorders can complicate the assessment and treatment of other conditions
- Wanting to stop drinking, therefore putting them at risk of acute withdrawal.

> **Practical tip**
>
> People may present with subtle signs of alcohol dependence, including:
> - Frequent falls or other accidents
> - Smelling of alcohol at inappropriate times (e.g., in the middle of the day).
>
> Take time to ask about their alcohol use. Use a sensitive approach and avoid patronising or judgemental language. Bear in mind that the patient may be defensive about your questioning or fear being labelled as an 'alcoholic'.

Seek senior advice if you are unsure about the diagnosis.

- A premature diagnosis of alcohol withdrawal can lead to inappropriate use of sedatives, which can further delay accurate diagnosis.[44]
- It is important to rule out other causes that can mimic or co-exist with alcohol withdrawal as these can be easily missed:
    - Infection (e.g., meningitis)[45]
    - Trauma (e.g., intracranial haemorrhage)[45]
    - Metabolic derangements[45]
    - Drug overdose[45]
    - Hepatic failure[45]
    - Gastrointestinal bleeding.

Assessing severity

Use a **validated scoring system**, such as CIWA-Ar ([Clinical Institute Withdrawal Assessment of Alcohol, revised]) or GMAWS ([Glasgow Modified Alcohol Withdrawal Scale]) with your clinical judgement to assess all patients with alcohol withdrawal, to gauge severity and guide management.[1] [2] [3]

- Check local protocols for recommendations on which scale to use and cut-off values for mild, moderate, and severe withdrawal. GMAWS is an alternative to CIWA-Ar for use in an acute hospital setting.[33]
- Assign a score to each item, based on your observations and the patient's answers to structured questioning.
    - Speak slowly and clearly; reword questions if needed.
- Add up the number of points to reach a total.

Use the total CIWA-Ar or GMAWS score to:[2] [3]

- Determine which patients need drug treatment
    - In general, patients with a CIWA-Ar score <10 or GMAWS <2 do not require drug treatment. However, they may require a period of monitoring and supportive treatment[3]
- Decide whether a patient is suitable for outpatient management
- Monitor patients during treatment.

Regardless of severity score, a patient having **seizures or alcohol withdrawal delirium** during the alcohol withdrawal period indicates **severe withdrawal**.[46]

Practical tip

Be careful not to underestimate or miscalculate the CIWA-Ar score. The patient may develop worsening withdrawal symptoms if they are not treated according to the severity of their symptoms.

- This is a common pitfall when assessing people who are sedated, are acutely agitated, or have language barriers. It may be difficult to use CIWA-Ar for these people as it relies on subjective reporting by the patient (e.g., for anxiety, nausea, and headache). Therefore, use your clinical judgement instead of CIWA-Ar score in these patients.

Evidence: Validation of CIWA-Ar

CIWA-Ar has been validated in many clinical settings with some exceptions such as the emergency department.

- CIWA-Ar has been shown to be effective for monitoring and determining future treatments. Evidence has shown that using CIWA-Ar to determine dose and frequency of a benzodiazepine reduces the overall amount of benzodiazepine given and the total treatment time [47] [48]
- CIWA-Ar has also been validated when translated into other languages such as German.[49]
- One study showed that the original CIWA score (an earlier iteration of the CIWA-Ar score with 15 items rather than 10) had good inter-rater validity by comparing scores rated by nurses with a 3-point global rating of severity made by a physician on initial assessment of the patient.[50] [51]
- However CIWA-Ar has not been validated for use in certain settings such as the emergency department.[51]

Severe withdrawal symptoms

Identify patients with features of severe alcohol withdrawal early. Involve senior support and consider referring the patient to **critical care**.

In any patient who is alcohol-dependent and has stopped or reduced their alcohol intake within hours or days of presentation, look for at least one of:[1] [2] [3] [33]

- A high or worsening CIWA-Ar ([Clinical Institute Withdrawal Assessment of Alcohol, revised]) or GMAWS ([Glasgow Modified Alcohol Withdrawal Scale]) score
- Failure to improve after two doses of a benzodiazepine
- Alcohol withdrawal delirium[4] [7]
- Alcohol withdrawal seizure[4] [7]
- Deranged temperature or deranged blood pressure or deranged blood glucose, alongside any feature of alcohol withdrawal.

Alcohol withdrawal delirium

Involve early senior support and consider referring the patient to **critical care** if you suspect alcohol withdrawal delirium (also known as delirium tremens). This is a **medical emergency** and is present in around 5% of patients with alcohol withdrawal.[9] These patients require urgent treatment (see the *Management Recommendations* section).

- Give oral lorazepam or diazepam if tolerated and switch to intravenous lorazepam if symptoms persist.
- Always give intravenous or high-dose benzodiazepines in a critical care environment.
    - Benzodiazepines can cause respiratory depression, particularly at higher doses or when given parenterally; therefore, facilities for managing respiratory depression with mechanical ventilation must be immediately available.
- Consider adding an antipsychotic if an adequate dose of a benzodiazepine has been given.
- The patient may require rapid tranquilisation.
- Early detection of alcohol withdrawal and prompt initiation of treatment is key to preventing the onset of alcohol withdrawal delirium.

Alcohol withdrawal delirium symptoms are rapid in onset and difficult to control. They tend to appear **48 to 72** hours after the patient's last alcoholic drink and may include:

- Profound confusion/delirium[9] [10]
  - This is fluctuating in nature and the patient may be disorientated to time, person, and place.
  - There is also clouding of consciousness.
  - Ask the patient to estimate how long your consultation has lasted.[52] Mild impairment of consciousness can occur in alcohol withdrawal delirium and can cause difficulty in estimating the passage of time.
  - Always consider Wernicke's encephalopathy in any confused patient with alcohol dependence. This is a neurological emergency. See our topic *Wernicke's encephalopathy.*
- Visual, auditory, and tactile hallucinations; characteristically frightening delusions[10]
  - Look for a hyperalert state.[52]
  - The patient may appear to be responding to unseen stimuli. There may be no discrimination between their response to large or small stimuli.
  - They may describe 'pins and needles', burning, numbness, or the sensation of insects crawling under their skin.[53]
- Coarse tremor[10]
- Features of clinical instability, which include tachycardia, fever, ketoacidosis, and circulatory collapse.[10]

Practical tip

Be aware of alcohol-induced psychotic disorder with hallucinations (previously known as alcoholic hallucinosis), a rare condition in chronic heavy drinkers that can be difficult to differentiate from withdrawal-induced psychosis. See the *Differentials* section for more details.

More info: Alcohol withdrawal delirium

Alcohol withdrawal delirium is fatal in 15% to 20% of patients if untreated.[34] [35] Appropriate early management reduces mortality to around 1%.[9] Patients most at risk of death with alcohol withdrawal delirium are those with a high fever (>39.9°C), tachycardia, dehydration and an associated illness (e.g., pneumonia or pancreatitis), or general debility, or where the diagnosis is delayed.[6]

More info: Wernicke's encephalopathy

Wernicke's encephalopathy results from thiamine deficiency and has varied neurocognitive manifestations, which typically involve mental status changes and gait and oculomotor dysfunction.[54] It is present in 12.5% of patients with alcohol dependence.[55]

See our topic *Wernicke's encephalopathy*.

Alcohol withdrawal seizures

Look for **generalised tonic-clonic** seizures. These patients require urgent treatment (see the *Management Recommendations* section).

- Ensure a patent airway immediately.
- Give **intravenous lorazepam** to control seizures. Always give intravenous benzodiazepines in a critical care environment.

- Benzodiazepines can cause respiratory depression, particularly when given parenterally; therefore, facilities for managing respiratory depression with mechanical ventilation must be immediately available.

See our topic *Generalised seizures* for more information.

Rule out causes other than alcohol withdrawal, especially if:[45]

- Seizures are focal
- There is no definite history of recent abstinence from drinking
- Seizures occur more than 48 hours after the patient's last drink (alcohol withdrawal seizures normally occur in the first 12 to 48 hours)[10]
- The patient has a history of fever or trauma.

Check capillary blood glucose in all patients with seizures.[56] Other common causes of seizures include significant head injury and central nervous system infection.[36] [57]

Request a CT head in any patient who has had a seizure.[37] [38] Consider using electroencephalography to help confirm the seizure has ended, particularly if there is suspicion of ongoing subtle seizures in an unresponsive or anaesthetised patient.[58]

Practical tip

Seizures may be the first manifestation of alcohol withdrawal in some people.[3]
- They develop due to changes in alcohol concentration and therefore may occur before the blood alcohol level has fallen to zero.[6]

Alcohol withdrawal is one of the most common causes of status epilepticus.[3] Several other legal and illegal pharmacological agents may induce seizures, due to either drug withdrawal (e.g., benzodiazepines) or a direct neurotoxic effect (e.g., antipsychotics, antidepressants, or stimulants). These may complicate the clinical picture and should be considered in the diagnosis of alcohol-related seizures.
Liver dysfunction and hepatic encephalopathy may also present with seizures.

Moderate or mild withdrawal symptoms

Not all patients with symptoms of alcohol withdrawal will need acute pharmacological treatment. You may be able to use supportive care to manage patients with mild to moderate alcohol withdrawal symptoms.[3]

- Moderate withdrawal symptoms include:
  - Restlessness
  - Coarse tremor
    - May be present in moderate alcohol withdrawal but is usually a sign of more severe alcohol withdrawal or alcohol withdrawal delirium[10]
  - Worsening minor symptoms.
- Mild symptoms include:
  - Insomnia and fatigue
  - Tremor

- Mild anxiety/feeling nervous
- Mild restlessness
- Nausea and vomiting
- Headache
- Excessive sweating
- Palpitations
- Anorexia
- Depression
- Craving for alcohol.

Practical tip

Look for a tremor by asking the patient to extend their arms and spread their fingers apart.[53]
- Mild tremor: may not be seen; can be felt fingertip to fingertip.
- Moderate tremor: can be seen with arms extended.
- Severe tremor: can be seen even without arms extended.

Be aware that some patients with mild or moderate withdrawal symptoms are at higher risk of developing severe withdrawal. Risk factors include:[1] [12] [32] [59] [60]

- Fever
- High levels of anxiety
- Tachycardia
- Hypoglycaemia
- Poor physical health
- Sweating
- Hypocalcaemia
- Other psychiatric disorders
- Concomitant use of other psychotropic drugs
- Previous history of severe withdrawal, seizures, and/or alcohol withdrawal delirium
- Hypokalaemia (with respiratory alkalosis)
- High alcohol intake (>15 units per day in a person of average build).

History

Mental capacity

Assess mental capacity early. Involve senior support when managing patients who lack capacity.

- You must be certain that the patient has capacity to make decisions about their treatment, including remaining in hospital.
    - In hospitals and care homes in England and Wales, use the Deprivation of Liberty Safeguards (DoLS) if a patient lacks capacity to make these decisions.[61] [SCIE: Deprivation of Liberty Safeguards (DoLS) at a glance]

Practical tip

Patients who are withdrawing from alcohol are at high risk of absconding.[62] [63]

- This is why it is important to assess their mental capacity soon after presentation.
- In practice, patients with capacity can often be persuaded to stay in hospital with a gentle approach in a calm and supportive environment.
- Carefully document your assessment of a patient's mental capacity; include thorough details of the decisions made at each stage.

Symptoms

Ask specifically about subjective symptoms of alcohol withdrawal. These include:

- Anxiety
- Nausea
- Insomnia
- Headache
- Tactile, visual, and auditory disturbances
- A history of blackouts, unexplained loss of consciousness, or seizures.

Assess cognition:[9] [10]

- Determine whether the patient is orientated to time, person, and place.

Screening tools

Use validated screening tools to: (i) identify any patient with alcohol-use disorder and (ii) assess the level of alcohol dependence in those who have tested positive for alcohol misuse.

- Screen the patient for alcohol-use disorder using a formal assessment tool such as AUDIT-C, FAST, PAT, or AUDIT.[2] Decide which to use based on local protocols, the setting of care, and your preference.
  - AUDIT-C ([Alcohol Use Disorders Identification Test - Consumption])[2]
    - A total score of ≥5 is a positive screen.
  - FAST ([Fast Alcohol Screening Test])
    - Conceived for use in emergency departments but can be used in a wide variety of settings.[3]
  - PAT ([Paddington Alcohol Test 2011])
    - Takes less than a minute to perform and useful in busy clinical settings.[64]
  - AUDIT ([Alcohol Use Disorders Identification Test])
    - The full version of AUDIT; takes longer to perform than the other screening tools and therefore may not be suitable in an acute hospital setting.[2]

Practical tip

It is important to calculate units of alcohol formally when using a screening tool as the increasing strength of alcoholic drinks and the larger glass sizes served in bars mean that people often drink more alcohol than they realise.[10]
Calculate units of alcohol as follows:[10]

- Number of units of alcohol = % ABV (alcohol by volume) x Volume (Litres)
- Online calculators can also be useful. [Alcohol Change UK: Unit calculator]

The risk of alcohol withdrawal is not directly related to intake. Some people who drink a lot of alcohol do not have withdrawal symptoms if they stop drinking.[60]

Evidence: Validity of formal assessment tools for alcohol-use disorder

Evidence has shown that commonly used formal assessment tools are effective at detecting alcohol-use disorder.

- Abbreviated versions of AUDIT, such as AUDIT-C and FAST, were developed for use in acute settings where the full AUDIT would take too long to perform. These compare favourably with the full screening tool.
- In a comparison of AUDIT with AUDIT-C and FAST in primary care:[65]
  - AUDIT-C was more sensitive than AUDIT and therefore a reliable test that could be used in place of the full version
  - FAST had a lower sensitivity than AUDIT
  - Therefore, AUDIT-C was recommended over FAST in primary care.
- PAT can be administered in about one fifth of the time taken to administer AUDIT and therefore may be useful in busy clinical settings. In a sample of 47 clinicians assessing people presenting to an emergency department in the UK, it took:[64]
  - 20 seconds to complete PAT (SD = 9.53)
  - 1 minute 13 seconds to complete AUDIT (SD = 27.6).

Evidence: Screening for alcohol-use disorder is performed poorly worldwide

Studies in Australia, the UK, the US, and Finland have demonstrated that clinicians infrequently screen for alcohol-use disorder; in at least one third to half of cases where the diagnosis is known, they fail to address the problem. [66] [67] [68]

- Other studies have reported on the quality of history taking in relation to alcohol use and suggested that poor alcohol history taking is prevalent in many clinical settings.[69] [70] [71] Some data show that no alcohol history of any sort was documented in the medical notes of more than 30% to 40% of acute general medical hospital admissions.[72] [73]
- It has been shown that screening and brief intervention programmes have beneficial long-term effects in cases of alcohol-use disorder, and hospital-based substance use consultations are reported to improve engagement in alcohol rehabilitation and treatment outcomes.[74] [75]

- Identify patients who have tested positive for alcohol misuse and are at risk of alcohol withdrawal by assessing their level of alcohol dependence. AUDIT-C, FAST, PAT, and AUDIT only identify

alcohol-use disorder and do not predict which patients are at risk of alcohol withdrawal. Decide which screening tool to use based on local protocols and your preference. Use either SAD-Q or the CAGE questionnaire.

- SAD-Q [Severity of Alcohol Dependence Questionnaire] [32]
  - This can help guide drug doses for treatment as well as identifying those at risk of alcohol withdrawal delirium.
  - A chlordiazepoxide detoxification regimen is usually indicated for anyone who scores ≥16.

- CAGE questionnaire[3] [5]
  - Ask four questions:[42]
    - C: Have you felt the need to cut down on your drinking?
    - A: Have you ever felt annoyed by someone criticising your drinking?
    - G: Have you ever felt bad or guilty about your drinking?
    - E: Have you ever had an eye-opener - a drink first thing in the morning to steady your nerves?
  - The test is considered positive if score ≥2.
  - This is a brief and effective test for lifetime alcohol abuse or dependence. It is commonly used in clinical practice.
  - However, it fails to detect binge drinking and is less sensitive in screening for mild to moderate alcohol withdrawal than other screening tools. It also does not distinguish between active and past problem drinking.[3] [5] [76]

Evidence: Use of CAGE

Studies have found that CAGE performs generally well in primary care settings but is less effective in certain populations (e.g., heavy drinkers).

- It is worth bearing in mind, however, that the studies inconsistently adhered to methodological standards for diagnostic test research, and some were unable to avoid workup bias and review bias in their methodology.[77] [78] [79] [80] [81]

Evidence: Use of SAD-Q

SAD-Q is considered a valid and reliable screening tool that has shown high test-retest reliability.

- SAD-Q has showed good test-retest reliability and significant correlations with observer ratings of withdrawal severity and narrowing of the drinking repertoire (e.g., drinking only one brand or type of alcohol rather than a variety of drinks).[82] [83]
- This has been independently confirmed in a sample of 102 people with alcohol-use disorder.[84]

Take account of the amount of alcohol that the patient reports drinking prior to admission/assessment as well as the result of SAD-Q/CAGE screening.[3]

- Ask about changes in drinking patterns, at least during the previous 5 days, as well as the time of the patient's last drink.[3]

Practical tip

Consider other diagnoses if the patient has consumed alcohol in the last 6 hours as alcohol withdrawal is unlikely within this timeframe. However, it is important to remember that patients can experience withdrawal symptoms even if their blood alcohol level has not reached zero.

Ask about other current substance misuse as well as comorbidities, including a psychiatric and social history.[1]

- Include a history of any injuries, especially **head injury**. Ask about:[36]
    - History of the injury – in particular, dangerous mechanisms (e.g., a pedestrian or cyclist struck by a motor vehicle, an occupant ejected from a motor vehicle, or a fall from a height of >1 metre or 5 stairs)
    - Vomiting
    - Retrograde amnesia.
- Identify why the patient has stopped or reduced their alcohol intake. Concurrent medical illness could be a factor as could social reasons (e.g., lack of money).
- Ask about risk factors for hepatitis B, hepatitis C, and HIV infection. These can co-exist with or complicate alcohol withdrawal.
- Take a collateral history.
    - Ask a relative or friend about the patient's alcohol intake whenever possible as patients may frequently underreport their own consumption.[3]
        - This may help the patient discuss their alcohol use more openly.
    - Ensure the relative/friend has access to support to cope with the impact that the patient's alcohol use has on them. Most alcohol services now offer this. [Carers Trust: Caring for someone with alcohol or substance misuse issues]

Physical examination

Assess for signs of alcohol withdrawal, commonly [1] [2] [3] [7][41]

- Anxiety
    - Ranges from the patient appearing at ease, but being mildly nervous, to acute panic states
- Nausea and vomiting
- Confusion
- Autonomic dysfunction
    - Tremor

- Tachycardia
- Sweating
- Palpitations

- Agitation.

Look for signs of **Wernicke's encephalopathy**. These include nystagmus, ataxia, and confusion. See our topic *Wernicke's encephalopathy*.

Look for signs of **head injury.**

- Can mimic or complicate alcohol withdrawal and can cause seizures. Have a low threshold for investigating with a CT head.
- In particular, assess for:[36]
  - Glasgow Coma Score (GCS) <13 on initial assessment in the emergency department
  - GCS <15 at 2 hours after the injury on assessment in the emergency department
  - An open or depressed skull fracture
  - Any sign of basal skull fracture (haemotympanum, 'panda' eyes, cerebrospinal fluid leakage from the ear or nose, Battle's sign)
  - Focal neurological deficit.

- See our topic *Assessment of traumatic brain injury, acute* for more information.

Evidence: Head injury and alcohol-use disorder

Alcohol-related injuries, particularly head injuries, constitute a significant proportion of patients seen in the emergency department.

Alcohol-related head injuries are particularly seen among young men, and are a common cause of seizures.

- As many as half of patients with significant head injury are under the influence of alcohol at the time of injury. Traumatic brain injuries (TBIs) frequently cause epileptic seizures. On the other hand, epileptic seizures are often caused by alcohol.[85]
- Alcohol abuse and TBI frequently co-occur, and alcohol consumption is common both before and after injury.[85] As many as one half of all patients with TBI are intoxicated on admission, and TBI recurrence is more common among patients with alcohol abuse than among others.[86] [87]

Alcohol-related injuries constitute a significant proportion of patients seen in the emergency department.

- Two studies have specifically examined the contribution of alcohol to head injuries presenting to accident and emergency (A&E) departments in the UK.
    - The first reported that 43% of 204 patients with head injuries presenting to an A&E department over a 10 week period had alcohol in their urine.[88]
    - A second, much larger study reported the workload pattern related to head injuries on an acute surgical unit in a central London teaching hospital.[89] Over a 6 month period, 899 patients with head injuries were treated in the A&E department, of whom 156 were admitted. Of these, 51% of the adult admissions were intoxicated by alcohol, and alcohol was associated with a significantly increased length of stay.
- An audit of 6114 patients with facial injuries presenting to 163 A&E departments in the UK during a week in 1997 reported that at least 22% were associated with alcohol consumption within 4 hours of the injury.[90]
- A study from Edinburgh examining 369 consecutive A&E admissions to a male 'acute' orthopaedic ward reported that alcohol had contributed to the accident in 19% of cases according to clinical assessment.[91]

Assess for features of acute medical illness and chronic or decompensated liver disease due to alcohol-use disorder. Be aware that all these patients need admission.

- Commonly associated acute illnesses include:
    - Pneumonia
    - Pancreatitis
    - Hepatitis
    - Gastritis (see *More info: Management of gastritis* below).
- Features of chronic or decompensated liver disease tend to be late signs of liver disease and therefore may not be present in all patients. These patients should be managed by a specialist. These features include:
    - Hepatomegaly
    - Jaundice
    - Ascites[92]

- Caput medusa[92]
- Palmar erythema[92]
- Hepatic encephalopathy.

See our topics *Alcoholic liver disease*, *Community-acquired pneumonia*, *Acute pancreatitis*, and *Gastritis* for more detail.

More info: Management of gastritis

Gastritis secondary to heavy alcohol use is common in patients with alcohol withdrawal. It is important to recognise and treat this. Alleviating the unpleasant symptoms will help keep the patient calm and settled, therefore reducing the risk of them absconding.

Use a proton pump inhibitor (e.g., omeprazole) for treatment in the acute setting. If there is persistent hypomagnesaemia or hypokalaemia consider switching to an H2 receptor antagonist (e.g., ranitidine).[93] [94]

Investigations

Alcohol withdrawal is a clinical diagnosis. However, test results may add weight to a suspicion of alcohol-use disorder and can be used to rule out other causes.[1] [2] [3]

Always interpret test results in the context of the patient's clinical history and other findings.

Do not test blood alcohol level using a breathalyser, unless you suspect that the patient is continuing to drink alcohol as an inpatient.

Do not use blood tests as general screening tools for alcohol misuse.

- However, they may be used alongside a formal screening tool (such as AUDIT-C [[Alcohol Use Disorders Identification Test - Consumption]], FAST [[Fast Alcohol Screening Test]], PAT [[Paddington Alcohol Test 2011]], or AUDIT [[Alcohol Use Disorders Identification Test]) to screen for alcohol misuse.
- Blood tests are less sensitive than a formal screening tool. However, they can support a clinical suspicion of alcohol misuse if alcohol consumption history is unavailable or considered unreliable.[3] They can also be used to monitor the patient's adherence to an alcohol intervention programme.

Evidence: Urine drug screening in alcohol withdrawal

In the acute setting, urine drug screening has little benefit and is not commonly used.

- A prospective analysis of 218 psychiatric patients in the emergency department compared self reporting of alcohol to urine drug screening. It showed that a drug and alcohol history was better than drug screening for detecting alcohol and cannabis use.[95]
- A review of over 1400 patients showed that using a urine drug screen had no significant impact on how patients were managed in the emergency setting.[96]

Always order

Venous blood gas

May show:

- Respiratory alkalosis in patients with alcohol withdrawal delirium due to significantly elevated cardiac indices, oxygen delivery, and oxygen consumption[97]
    - Hyperventilation and consequent respiratory alkalosis with alcohol withdrawal delirium may result in a significant decrease in cerebral blood flow[97]
- Hypochloraemic metabolic acidosis with vomiting[98]
- Metabolic acidosis with a high anion gap if alcohol ketoacidosis is present. This is a potential cause of alcohol withdrawal as well as a differential diagnosis.[99]

Blood glucose

Hypoglycaemia is common in patients with alcohol dependence or withdrawal and may be secondary to poor nutrition or heavy alcohol use.

- Replace glucose orally if tolerated or intravenously if the patient has impaired consciousness. Consider intramuscular glucose if venous access is unavailable.

If you give glucose, give it at the same time or after thiamine. However, do not delay glucose for life-threatening hypoglycaemia while waiting for thiamine administration.

- Some evidence suggests that prolonged glucose supplementation without the addition of thiamine can be a risk factor for the development of Wernicke's encephalopathy.[100] [101] [102]

Full blood count

Increased mean corpuscular volume is indicative of chronic alcohol-use disorder.[5]

- May remain elevated 3 to 4 months after the patient stops drinking alcohol.
- Not a specific test; can be elevated as a result of vitamin B12 or folate deficiency.

Thrombocytopenia in patients with alcohol-use disorder is caused by splenomegaly, folate deficiency, and, most frequently, a direct toxic effect of alcohol on production, survival time, and function of platelets.[103]

- Generally benign; clinically significant haemorrhage is rare.[103]

Urea and electrolytes

Electrolyte deficiencies are common in people with chronic alcohol-use disorder.[104]

- They can cause life-threatening cardiac arrhythmias; always perform an ECG on patients with electrolyte deficiencies.[105] [106] [107] [108]
- In those admitted to hospital with chronic alcohol-use disorder, plasma magnesium, potassium, and phosphorus concentrations may be normal or only slightly reduced on admission, only to decrease over several days. This is due to an inward cellular shift that unmasks decreased total-body stores.[104]

Hypomagnesaemia: occurs in almost one third of people with chronic alcohol-use disorder [104]

Practical tip

Hypocalcaemia and hypokalaemia will not resolve until adequate magnesium replacement is given.[109]

Hypokalaemia: seen in nearly 50% of hospitalised patients with chronic alcohol-use disorder [104]

- Results from inadequate intake and gastrointestinal losses due to diarrhoea. Urinary losses also contribute.

Hypophosphataemia (refeeding syndrome): develops in up to 50% in patients hospitalised for problems related to chronic alcohol overuse [104]

Liver function tests

Liver enzymes (aspartate aminotransferase [AST], alanine aminotransferase [ALT], and gamma-glutamyl transpeptidase [GGT]) may be elevated.[110]

- ALT: almost always elevated, and normally higher than AST, in patients with alcoholic liver disease. The classic ratio of AST:ALT >2 is seen in about 70% of patients.[110]
- GGT: may be increased with heavy alcohol consumption [111]
  - Usually returns to normal levels within 2 to 3 weeks after the patient stops drinking alcohol if there is no chronic liver damage [111]
  - GGT greater than 10 times the upper limit of normal is commonly associated with excessive drinking.[112] Smaller elevations of GGT (e.g., 2-3 times the upper limit of normal) tend to be caused by other conditions including non-alcoholic fatty liver disease.[113]

Bone profile

Use to detect:

- Hypocalcaemia[104]
  - Secondary to hypomagnesaemia suppressing parathyroid hormone
- Low vitamin D[104]
  - Risk factors include:
    - Poor dietary intake of vitamin D
    - Lack of exposure to sunlight
    - Direct effects of alcohol on vitamin D metabolism
    - Decreased absorption in patients with alcohol-related steatorrhoea.

Coagulation studies

International normalised ratio (INR) and prothrombin time (PT) may be prolonged in chronic liver disease.[114]

- They correlate well with the severity of liver disease but are not predictive of bleeding risk.

Activated partial thromboplastin time (aPTT) does not usually reflect liver dysfunction; it is typically normal or nearly normal in liver disease.[114]

Consider requesting

Blood cultures

Request in patients who are febrile to look for evidence of infection.[115]

Computed tomography (CT) head

Request in patients with any one of:

- Alcohol related seizure[37] [38]
- Altered cognition[36] [39] [40]
    - Use the Glasgow Coma Scale (GCS) to assess conscious level
- Suspected head injury plus one of the following:[36]
    - GCS <13 on initial assessment
    - GCS <15 at 2 hours after the injury on assessment
    - Suspected open or depressed skull fracture
    - Any sign of basal skull fracture (haemotympanum, 'panda' eyes, cerebrospinal fluid leakage from the ears or nose, Battle's sign)
    - Post-traumatic seizure
    - Focal neurological deficit
    - >1 episode of vomiting.

Practical tip

Always suspect head injury in patients who are withdrawing from alcohol; have a low threshold for requesting a CT head. Alcohol intoxication is an independent risk factor for a positive finding on CT head following head injury [116] Patients who drink heavily are more likely to bleed after a head injury due to deranged clotting and thrombocytopenia.

Chest x-ray

Consider if there are signs of respiratory distress.

- Co-existing pneumonia is common in patients with alcohol withdrawal.[117]
- There is also the possibility of aspiration, especially in people with reduced consciousness or those who have had seizures.[118]

ECG

Perform in patients with tachycardia to look for arrhythmias.

- These include atrial fibrillation and ventricular tachyarrhythmias.[119]

Amylase and lipase

Measure if there is abdominal pain, diarrhoea, or nausea and vomiting.[120] [121]

- Elevated levels may indicate acute pancreatitis which is a complication of heavy alcohol use.[120] See our topic *Acute pancreatitis*.

Ammonia

Consider in all patients with an altered level of consciousness and signs of liver disease.

- Elevation may indicate liver failure.[122]

> **Practical tip**
>
> Check local protocols before taking an ammonia sample as guidelines vary. The sample may need to be sent on ice and there may be a time limit (from taking the sample to testing) to adhere to.

Lumbar puncture

Perform a lumbar puncture if you suspect subarachnoid haemorrhage (SAH) and the initial CT head is normal or if you suspect central nervous system (CNS) infection.[57] [123]

- Consider CNS infection or SAH if symptoms of confusion are worsening or failing to improve despite treatment for alcohol withdrawal, especially if the patient has a headache, fever, or neck stiffness.
- Treat empirically if there is diagnostic uncertainty before waiting for lumbar puncture results.[124]

Electroencephalography (EEG)

Perform in all patients with first presentation of an alcohol withdrawal seizure or when there is a new seizure pattern in patients with a known history of alcohol-related seizures (e.g., focal seizures or status epilepticus).[58]

- Use EEG to help confirm the seizure has ended, particularly if you suspect ongoing subtle seizures in an unresponsive or anaesthetised patient.[58]
- The incidence of EEG abnormalities is lower with alcohol withdrawal seizures than other causes of seizures.[3]
- Do not perform an EEG if the patient has had previous comprehensive investigation of their seizures and the pattern of current seizures is consistent with past events.[58]

> **Practical tip**
>
> Access to EEG is limited; it is not commonly used outside of the intensive care setting.

Evidence: Use of EEG in alcohol withdrawal seizures

There is limited evidence to support either the use of EEG in alcohol withdrawal seizures or the notion that EEG monitoring independently improves outcome in convulsive status epilepticus (SE).

- However, EEG can contribute prognostic information. Continuing electrographic status is associated with worse outcomes in convulsive SE; some studies have shown that periodic epileptiform discharges are associated with a worse outcome independent of the cause of SE.[125] [126]

Blood-borne virus screen

Order if you suspect hepatitis B, hepatitis C, or HIV infection.

Admission to hospital

Take a comprehensive history and use this, alongside examination findings, to guide whether to admit the patient to hospital.

Consider admission to hospital in:[1] [32]

- Young people (under 16 years)
- Those at high risk of developing alcohol withdrawal seizures or alcohol withdrawal delirium. These patients typically have at least one of:
  - A score >30 on SAD-Q
  - Alcohol intake >30 units of alcohol per day
  - Signs and symptoms of autonomic overactivity (e.g., tremor, tachycardia sweating, or palpitations)
  - Signs of intoxication.

Evidence: Factors that increase the risk of severe withdrawal symptoms

It has been proposed that an increased number of medically assisted withdrawals is a risk factor for the development of severe withdrawal symptoms.

- Evidence shows that patients with a history of previous assisted withdrawals are significantly more likely to develop severe withdrawal symptoms.
  - One study showed that severe withdrawal symptoms (defined as a requirement for ≥600 mg of total, cumulative chlordiazepoxide) was significantly associated with participation in two or more prior alcohol treatment programmes.[127]
  - It has also been demonstrated that ≥2 previous assisted alcohol withdrawals is associated with a slower rate of decline on the CIWA-Ar on days 0 to 4 of the ongoing withdrawal.[128]
- Studies report that patients with a history of previous detoxifications or withdrawals (particularly in the last 3 years) are significantly more likely to experience a seizure.[29] [129] [130]
- One study looked at the risk of developing severe withdrawal symptoms after assessment in the emergency department. It showed that a history of withdrawal seizures independently contributed 6.8% to the risk of developing alcohol withdrawal delirium (although this study uses the term 'delirium tremens' instead of 'alcohol withdrawal delirium') as part of the ongoing withdrawal. It also identified that a history of alcohol withdrawal delirium contributed 6% to the risk of developing alcohol withdrawal delirium . Signs of overactivity of the autonomic nervous system accompanied by an alcohol concentration of >100 mg/dL of body fluid was also significantly associated with the development of alcohol withdrawal delirium.[131]
- Other factors that increase the risk of severe withdrawal include:[127] [132] [133]
  - Increased blood alcohol level on admission
    - One study reported a blood alcohol level >43 mmol/L (200 mg/dL) as a significant predictor[132]
  - Increased number of days since last alcohol intake.
  - A history of alcohol withdrawal delirium.

If considering **discharge** (without admission) **advise the patient to continue drinking alcohol.** Stopping abruptly may lead to severe withdrawal.

- If possible, the patient should gradually reduce their intake over several weeks/months.
- It is common practice to advise them to decrease their level of drinking by not more than 25% every 2 weeks.

Have a lower threshold when considering admission to hospital of vulnerable people who are in acute alcohol withdrawal. These include people who:[1] [32]

- Are frail
- Have cognitive impairment or multiple comorbidities, including poorly controlled chronic medical conditions and serious psychiatric conditions such as suicidal ideation and psychosis
- Lack social support
- Have learning difficulties
- Are aged 16 or 17 years.

Practical tip

Pay attention to why the patient has stopped drinking. They may have run out of money or feel too unwell (owing to concomitant illness) to drink alcohol and are therefore at risk of developing worsening symptoms if they aren't admitted for medically assisted withdrawal.
Never advise a patient who is being discharged to suddenly stop or reduce their drinking as this could precipitate severe symptoms. Signpost to outpatient services where controlled withdrawal can be organised.[1] Check local protocols for what is recommended and available in your area.

- Many patients who are alcohol-dependent manage their withdrawal symptoms every day with continued alcohol consumption. It is often appropriate to continue this until the patient can be assessed formally by addiction services who will help determine the best treatment for the individual patient.[2]

Unnecessary inpatient detoxification is not only detrimental to the patient's health but also unlikely to result in continued abstinence and long-term change.[134] [135]

History and exam

Key diagnostic factors

risk factors (common)

Take a comprehensive history to identify risk factors for alcohol withdrawal, with a specific focus on:

- Alcohol-use disorder
  - Screen the patient for alcohol-use disorder using a **formal assessment tool** such as AUDIT-C, FAST, PAT, or AUDIT.[2] Decide which to use based on local protocols, the setting of care, and your preference.
    - AUDIT-C ([Alcohol Use Disorders Identification Test - Consumption])[2]
      - A total score of ≥5 is a positive screen.
    - FAST ([Fast Alcohol Screening Test])
      - Conceived for use in emergency departments but can be used in a wide variety of settings.[3]
    - PAT ([Paddington Alcohol Test 2011])
      - Takes less than a minute to perform and useful in busy clinical settings.[64]
    - AUDIT ([Alcohol Use Disorders Identification Test])
      - The full version of AUDIT; takes longer to perform than the other screening tools and therefore may not be suitable in an acute hospital setting.[2]

Practical tip

It is important to calculate units of alcohol formally when using a screening tool as the increasing strength of alcoholic drinks and the larger glass sizes served in bars mean that people often drink more alcohol than they realise.[10]
Calculate units of alcohol as follows:[10]

- Number of units of alcohol = % ABV (alcohol by volume) x Volume (Litres)
- Online calculators can also be useful. [Alcohol Change UK: Unit calculator]

The risk of alcohol withdrawal is not directly related to intake. Some people who drink a lot of alcohol do not have withdrawal symptoms if they stop drinking.[60]

Evidence: Validity of formal assessment tools for alcohol-use disorder

Evidence has shown that commonly used formal assessment tools are effective at detecting alcohol-use disorder.

- Abbreviated versions of AUDIT, such as AUDIT-C and FAST, were developed for use in acute settings where the full AUDIT would take too long to perform. These compare favourably with the full screening tool.
- In a comparison of AUDIT with AUDIT-C and FAST in primary care:[65]
    - AUDIT-C was more sensitive than AUDIT and therefore a reliable test that could be used in place of the full version
    - FAST had a lower sensitivity than AUDIT
    - Therefore, AUDIT-C was recommended over FAST in primary care.
- PAT can be administered in about one fifth of the time taken to administer AUDIT and therefore may be useful in busy clinical settings. In a sample of 47 clinicians assessing people presenting to an emergency department in the UK, it took:[64]
    - 20 seconds to complete PAT (SD = 9.53)
    - 1 minute 13 seconds to complete AUDIT (SD = 27.6).

Evidence: Screening for alcohol-use disorder is performed poorly worldwide

Studies in Australia, the UK, the US, and Finland have demonstrated that clinicians infrequently screen for alcohol-use disorder; in at least one third to half of cases where the diagnosis is known, they fail to address the problem. [66] [67] [68]

- Other studies have reported on the quality of history taking in relation to alcohol use and suggested that poor alcohol history taking is prevalent in many clinical settings.[69] [70] [71] Some data show that no alcohol history of any sort was documented in the medical notes of more than 30% to 40% of acute general medical hospital admissions.[72] [73]
- It has been shown that screening and brief intervention programmes have beneficial long-term effects in cases of alcohol-use disorder, and hospital-based substance use consultations are reported to improve engagement in alcohol rehabilitation and treatment outcomes.[74] [75]

- Take a collateral history.
    - Ask a relative or friend about the patient's alcohol intake whenever possible as patients may frequently underreport their own consumption.[3]
        - This may help the patient discuss their alcohol use more openly.

- History of alcohol withdrawal
    - Patients with mild or moderate withdrawal symptoms and a previous history of severe withdrawal, seizures, and/or alcohol withdrawal delirium have a higher risk of developing severe withdrawal.[12]

- Poor physical health
    - Assess for features of chronic or decompensated liver disease due to alcohol-use disorder. Be aware that all these patients need admission.
        - Features of chronic or decompensated liver disease tend to be late signs of liver disease and therefore may not be present in all patients. These patients should be managed by a specialist. These features include:
            - Hepatomegaly
            - Jaundice
            - Ascites[92]
            - Caput medusa[92]
            - Palmar erythema[92]
            - Hepatic encephalopathy.

- Assess for features of poor nutrition. These may include:
  - Thiamine deficiency
    - Look for signs of **Wernicke's encephalopathy**, including nystagmus, ataxia and confusion.
  - Vitamin D deficiency. Risk factors include:
    - Poor dietary intake of vitamin D
    - Lack of exposure to sunlight
    - Direct effects of alcohol on vitamin D metabolism
    - Decreased absorption in patients with alcohol-related steatorrhoea.
- Ask about risk factors for hepatitis B, hepatitis C, and HIV infection. These can co-exist with or complicate alcohol withdrawal.

- Acute intercurrent illness
  - Assess for features of acute medical illness. Be aware that all these patients need admission.
    - Commonly associated acute illnesses include:
      - Pneumonia
      - Pancreatitis
      - Hepatitis
      - Gastritis.

alcohol dependence (common)

Identify patients who have tested positive for alcohol misuse and are at risk of alcohol withdrawal by assessing their level of alcohol dependence. Decide which **screening tool** to use based on local protocols and your preference. Use either SAD-Q or the CAGE questionnaire.

- SAD-Q ([Severity of Alcohol Dependence Questionnaire])[32]
  - This can help guide drug doses for treatment as well as identifying those at risk of alcohol withdrawal delirium.
  - A chlordiazepoxide detoxification regimen is usually indicated for anyone who scores ≥16.
- CAGE questionnaire[3] [5]
  - Ask four questions:[42]
    - C: Have you felt the need to cut down on your drinking?

- A: Have you ever felt annoyed by someone criticising your drinking?
- G: Have you ever felt bad or guilty about your drinking?
- E: Have you ever had an eye-opener - a drink first thing in the morning to steady your nerves?

- The test is considered positive if score ≥2.
- This is a brief and effective test for lifetime alcohol abuse or dependence. It is commonly used in clinical practice.
- However, it fails to detect binge drinking and is less sensitive in screening for mild to moderate alcohol withdrawal than other screening tools. It also does not distinguish between active and past problem drinking.[5] [3] [76]

Evidence: Use of CAGE

Studies have found that CAGE performs generally well in primary care settings but is less effective in certain populations (e.g., heavy drinkers).

- It is worth bearing in mind, however, that the studies inconsistently adhered to methodological standards for diagnostic test research, and some were unable to avoid workup bias and review bias in their methodology.[77] [78] [79] [80] [81]

Evidence: Use of SAD-Q

SAD-Q is considered a valid and reliable screening tool that has shown high test-retest reliability.

- SAD-Q has showed good test-retest reliability and significant correlations with observer ratings of withdrawal severity and narrowing of the drinking repertoire (e.g., drinking only one brand or type of alcohol rather than a variety of drinks).[82] [83]
- This has been independently confirmed in a sample of 102 people with alcohol-use disorder.[84]

Take account of the amount of alcohol that the patient reports drinking prior to admission/assessment as well as the result of SAD-Q/CAGE screening.[3]

- Ask about changes in drinking patterns, at least during the previous 5 days, as well as the time of the patient's last drink.[3]

Practical tip

People may present with subtle signs of alcohol dependence:

- Frequent falls or other accidents
- Smelling of alcohol at inappropriate times (e.g., in the middle of the day).

Take time to ask about their alcohol use. Use a sensitive approach and avoid patronising or judgemental language. Bear in mind that the patient may be defensive about your questioning or fear being labelled as an 'alcoholic'.

cessation or reduction in alcohol intake (common)

Suspect acute or imminent alcohol withdrawal in any patient who is alcohol-dependent and has **stopped or reduced** their alcohol intake within **hours or days** of presentation.[1] [2] [3][4] [5] [7]

Ask when the patient's last alcoholic drink was to determine the timing of onset of their symptoms.

- Mild to moderate symptoms tend to start 6 to 12 hours after the patient's last alcoholic drink and peak between 24 and 36 hours.[2][4] [5]
- **Alcohol withdrawal delirium** tends to start **48 to 72 hours** after the patient's last alcoholic drink and peaks at 5 days.[1] [2] [3] [7]
- Alcohol withdrawal seizures tend to occur in the first 12 to 24 hours.[10]

Practical tip

Consider other diagnoses if the patient has consumed alcohol in the last 6 hours as alcohol withdrawal is unlikely within this timeframe. However, it is important to remember that patients can experience withdrawal symptoms even if their blood alcohol level has not reached zero.

at least one feature of alcohol withdrawal (common)

Use a validated **scoring system**, such as CIWA-Ar ([Clinical Institute Withdrawal Assessment of Alcohol, revised]) or GMAWS ([Glasgow Modified Alcohol Withdrawal Scale]), with your clinical judgement to assess all patients with alcohol withdrawal, to gauge severity and guide management.[1] [2] [3]

- Check local protocols for recommendations on which scale to use and cut-off values for mild, moderate, and severe withdrawal. GMAWS is an alternative to CIWA-Ar for use in an acute hospital setting.[33]
- Assign a score to each item, based on your observations and the patient's answers to structured questioning.
    - Speak slowly and clearly; reword questions if needed.
- Add up the number of points to reach a total.

Use the total CIWA-Ar or GMAWS score to:[2] [3]

- Determine which patients need drug treatment

- In general, patients with a CIWA-Ar score <10 or GMAWS <2 do not require drug treatment. However, they may require a period of monitoring and supportive treatment[3]

- Decide whether a patient is suitable for outpatient management
- Monitor patients during treatment.

Regardless of severity score, a patient having seizures or alcohol withdrawal delirium during the alcohol withdrawal period indicates severe withdrawal.[46]

Practical tip

Be careful not to underestimate or miscalculate the CIWA-Ar score. The patient may develop worsening withdrawal symptoms if they are not treated according to the severity of their symptoms.

- This is a common pitfall when assessing people who are sedated, acutely agitated, or have language barriers. It may be difficult to use CIWA-Ar for these people as it relies on subjective reporting by the patient (e.g., for anxiety, nausea, and headache). Therefore, use your clinical judgement instead of CIWA-Ar score in these patients.

Evidence: Validation of CIWA-Ar

CIWA-Ar has been validated in many clinical settings with some exceptions such as the emergency department.

- CIWA-Ar has been shown to be effective for monitoring and determining future treatments. Evidence has shown that using CIWA-Ar to determine dose and frequency of a benzodiazepine reduces the overall amount of benzodiazepine given and the total treatment time.[47] [48]
- CIWA-Ar has also been validated when translated into other languages such as German.[49]
- One study showed that the original CIWA score (an earlier iteration of the CIWA-Ar score with 15 items rather than 10) had good inter-rater validity by comparing scores rated by nurses with a 3-point global rating of severity made by a physician on initial assessment of the patient.[50] [51]
- However CIWA-Ar has not been validated for use in certain settings such as the emergency department.[51]

Identify patients with **features of severe alcohol withdrawal** early. Involve senior support and consider referring the patient to critical care. Look for at least one of:[1] [2] [3] [33]

- A high or worsening CIWA-Ar ([Clinical Institute Withdrawal Assessment of Alcohol, revised]) or GMAWS ([Glasgow Modified Alcohol Withdrawal Scale]) score
- Failure to improve after two doses of a benzodiazepine
- Alcohol withdrawal delirium[4] [7]
- Alcohol withdrawal seizure[4] [7]

- Deranged temperature or deranged blood pressure or deranged blood glucose, alongside any feature or alcohol withdrawal.[45]

Common mild or moderate alcohol withdrawal symptoms include:[1][2] [3] [7] [41]

- Anxiety
- Nausea and vomiting
- Autonomic dysfunction
    - Tremor
    - Tachycardia
    - Sweating
    - Palpitations
- Insomnia.

seizures (uncommon)

Seizures are a feature of severe alcohol withdrawal.

Look for **generalised tonic-clonic** seizures (see our topic *Generalised seizures*).

- These patients require urgent treatment: ensure a patent airway immediately. See the *Management Recommendations* section for details of other interventions.

Rule out causes other than alcohol withdrawal especially if:[45]

- Seizures are focal
- There is no definite history of recent abstinence from drinking
- Seizures occur more than 48 hours after the patient's last drink (alcohol withdrawal seizures normally occur in the first 12-24 hours)[10]
- The patient has a history of fever or trauma.

Check capillary blood glucose in all patients with seizures.[56]

Practical tip

Seizures may be the first manifestation of alcohol withdrawal in some people.[3]

- They develop due to changes in alcohol concentration and therefore may occur before the blood alcohol level has fallen to zero.[6]
- Other common causes of seizures include significant head injury and central nervous system infection.[36] [57]

Alcohol withdrawal is one of the most common causes of status epilepticus.[3]
Several other legal and illegal pharmacological agents may induce seizures, due to either drug withdrawal (e.g., benzodiazepines) or a direct neurotoxic effect (e.g., antipsychotics, antidepressants, or stimulant drugs). These may complicate the clinical picture and should be considered in the diagnosis of alcohol-related seizures.
Liver dysfunction and hepatic encephalopathy may also present with seizures.

alcohol withdrawal delirium (uncommon)

Involve early senior support and consider referring to **critical care** if you suspect alcohol withdrawal delirium (also known as delirium tremens).

This is a **medical emergency** and is present in around 5% of patients with alcohol withdrawal.[9] These patients require urgent treatment (see the *Management Recommendations* section).

Alcohol withdrawal delirium symptoms are rapid in onset and difficult to control. They tend to appear **48 to 72 hours** after the patient's last alcoholic drink and may include:

- Profound confusion/delirium[9] [10]
    - This is fluctuating in nature and the patient may be disorientated to time, person, and place.
    - There is also clouding of consciousness.
    - Ask the patient to estimate how long your consultation has lasted.[52] Mild impairment of conscious level can occur in alcohol withdrawal delirium and can cause difficulty in estimating the passage of time.
    - Always consider Wernicke's encephalopathy in any confused patient with alcohol dependence. This is a neurological emergency. See our topic *Wernicke's encephalopathy*.
- Visual, auditory, and tactile hallucinations; characteristically frightening delusions[10]
    - Look for a hyperalert state.[52]
    - The patient may appear to be responding to unseen stimuli. There may be no discrimination between their response to large or small stimuli.
    - They may describe 'pins and needles', burning, numbness, or the sensation of insects crawling under their skin.[53]
- Coarse tremor[10]
- Features of clinical instability, which include tachycardia, fever, ketoacidosis, and circulatory collapse.[10]

Practical tip

Be aware of alcohol-induced psychotic disorder with hallucinations (previously known as alcoholic hallucinosis), a rare condition in chronic heavy drinkers that can be difficult to differentiate from withdrawal-induced psychosis. See the *Differentials* section for more details.

More info: Alcohol withdrawal delirium

Alcohol withdrawal delirium is fatal in 15% to 20% of patients if untreated.[34] [35] Appropriate early management reduces mortality to around 1%.[9] Patients most at risk of death with alcohol withdrawal delirium are those with a high fever (>39.9°C), tachycardia, dehydration and an associated illness (e.g., pneumonia or pancreatitis), or general debility, or where the diagnosis is delayed.[6]

More info: Wernicke's encephalopathy

Wernicke's encephalopathy results from thiamine deficiency and has varied neurocognitive manifestations, which typically involve mental status changes and gait and oculomotor dysfunction.[54] It is present in 12.5% of patients with alcohol dependence.[55]

See our topic *Wernicke's encephalopathy*.

agitation (uncommon)

May range from restlessness to more severe agitation.[2]

coarse tremor (uncommon)

A coarse tremor may be present in moderate alcohol withdrawal but it is usually a sign of more severe alcohol withdrawal or **alcohol withdrawal delirium**.[10]

Practical tip

Look for a tremor by asking the patient to extend their arms and spread their fingers apart.[53]

- Moderate tremor: can be seen with arms extended.
- Severe tremor: can be seen even without arms extended.

hypertension or hypotension (uncommon)

Deranged blood pressure, alongside any feature of alcohol withdrawal, might indicate severe withdrawal. [45]

fever or hypothermia (uncommon)

Deranged temperature, alongside any feature of alcohol withdrawal, might indicate severe withdrawal.[45]

hyperglycaemia or hypoglycaemia (uncommon)

Deranged blood sugar, alongside any feature of alcohol withdrawal, might indicate severe withdrawal.[45]

Other diagnostic factors

anxiety (common)

Ranges from the patient appearing at ease, but being mildly nervous, to acute panic states.[2] [3] [7]

nausea and vomiting (common)

A common presentation.

- Consider concurrent acute pancreatitis, a complication of heavy alcohol use, if the patient is nauseous or vomiting.[120] See our topic *Acute pancreatitis*.

autonomic dysfunction (common)

Signs and symptoms include:

- Tremor

> **Practical tip**
>
> Look for a tremor by asking the patient to extend their arms and spread their fingers apart.[53]
> - Mild tremor: may not be seen; can be felt fingertip to fingertip.
> - Moderate tremor: can be seen with arms extended.
> - Severe tremor: can be seen even without arms extended.

- Tachycardia
  - A feature of severe withdrawal and alcohol withdrawal delirium[7]
- Sweating
  - May be seen even in mild withdrawal[59]
- Palpitations.[41]

insomnia (common)

A common symptom of mild alcohol withdrawal.[7]

craving for alcohol (common)

Can be present even in those with mild withdrawal.[137]

headache (uncommon)

A presenting feature seen even in mild alcohol withdrawal.

- Consider central nervous system infection or subarachnoid haemorrhage if there is associated neck stiffness, fever, or confusion.[57] [123]

anorexia (uncommon)

Can be seen even in people with mild alcohol withdrawal.[7]

depression (uncommon)

Can be present even in those with mild alcohol withdrawal.[41]

Investigations

1st test to order

Test	Result
venous blood gas May show: • Respiratory alkalosis in patients with alcohol withdrawal delirium (also known as delirium tremens) due to significantly elevated cardiac indices, oxygen delivery, and oxygen consumption[97] • Hyperventilation and consequent respiratory alkalosis with alcohol withdrawal delirium may result in a significant decrease in cerebral blood flow[97] • Hypochloraemic metabolic acidosis with vomiting[98] • Metabolic acidosis with a high anion gap if alcohol ketoacidosis is present. This is a potential cause of alcohol withdrawal as well as a differential diagnosis.[99]	• respiratory alkalosis • hypochloraemic metabolic acidosis • metabolic acidosis with a high anion gap
blood glucose Hypoglycaemia is common in patients with alcohol dependence or withdrawal and may be secondary to poor nutrition or heavy alcohol use. • Replace glucose orally if tolerated or intravenously if the patient has impaired consciousness. Consider intramuscular glucose if venous access is unavailable. • If you give glucose, give it at the same time or after thiamine. However, do not delay glucose for life-threatening hypoglycaemia while waiting for thiamine administration. • Some evidence suggests that prolonged glucose supplementation without the addition of thiamine can be a risk factor for the development of Wernicke's encephalopathy.[100] [101] [102]	• hypoglycaemia
full blood count Increased mean corpuscular volume (MCV) is indicative of chronic alcohol-use disorder.[5] • May remain elevated 3 to 4 months after the patient stops drinking alcohol. • Not a specific test; can be elevated as a result of vitamin B12 or folate deficiency.	• increased MCV • thrombocytopenia

Test	Result
Thrombocytopenia in patients with alcohol-use disorder is caused by splenomegaly, folate deficiency, and, most frequently, a direct toxic effect of alcohol on production, survival time, and function of platelets.[103] • Generally benign; clinically significant haemorrhage is rare.[103]	
urea and electrolytes Electrolyte deficiencies are common in people with chronic alcohol-use disorder.[104] • They can cause life-threatening cardiac arrhythmias; always perform an ECG on patients with electrolyte deficiencies.[105] [106] [107] [108] In those admitted to hospital with chronic alcohol-use disorder, plasma magnesium, potassium, and phosphorus concentrations may be normal or only slightly reduced on admission, only to decrease over several days. This is due to an inward cellular shift that unmasks decreased total-body stores [104] Hypomagnesaemia: occurs in almost one third of people with chronic alcohol-use disorder [104] **Practical tip** Hypocalcaemia and hypokalaemia will not resolve until adequate magnesium replacement is given.[109] Hypokalaemia: seen in nearly 50% of hospitalised patients with chronic alcohol-use disorder [104] • Results from inadequate intake and gastrointestinal losses due to diarrhoea. Urinary losses also contribute. Hypophosphataemia (refeeding syndrome): develops in up to 50% of patients hospitalised for problems related to chronic alcohol overuse [104]	• hypomagnesaemia • hypokalaemia • hypophosphataemia
liver function tests Liver enzymes (aspartate aminotransferase [AST], alanine aminotransferase [ALT], and gamma-glutamyl transpeptidase [GGT]) may be elevated.[110] • ALT: almost always elevated, and normally higher than AST, in patients with alcoholic liver disease. The classic ratio of AST:ALT >2 is seen in about 70% of patients.[110] • GGT: may be increased with heavy alcohol consumption.[111] • Usually returns to normal levels within 2 to 3 weeks after the patient stops drinking alcohol if there is no chronic liver damage [111] • GGT greater than 10 times the upper limit of normal is commonly associated with excessive drinking.[112]	• elevated liver enzymes (AST, ALT, and GGT)

Test	Result
Smaller elevations of GGT (e.g., 2-3 times the upper limit of normal) tend to be caused by other conditions including non-alcoholic fatty liver disease.[113]	

bone profile
Use to detect:
• Hypocalcaemia[104]
  • Secondary to hypomagnesaemia suppressing parathyroid hormone
• Low vitamin D[104]
  • Risk factors include:
  • Poor dietary intake of vitamin D
  • Lack of exposure to sunlight
  • Direct effects of alcohol on vitamin D metabolism
  • Decreased absorption in patients with alcohol-related steatorrhoea.
	• hypocalcaemia
	• low vitamin D

coagulation studies International normalised ratio (INR) and prothrombin time (PT) may be prolonged in chronic liver disease.[114] • They correlate well with the severity of liver disease but are not predictive of bleeding risk. Activated partial thromboplastin time (aPTT) does not usually reflect liver dysfunction; is typically normal or nearly normal in liver disease.[114]	• prolonged INR and PT in chronic liver disease

Other tests to consider

Test	Result
blood cultures Request in patients who are febrile to look for evidence of infection.[115]	• positive if infection present

CT head
Request in patients with any one of:
• Alcohol-related seizure[37] [38]
• Altered cognition[36] [39] [40]
  • Use the Glasgow Coma Scale (GCS) to assess conscious level
• Suspected head injury plus one of the following:[36]
  • GCS <13 on initial assessment
  • GCS <15 at 2 hours after the injury on assessment
  • Suspected open or depressed skull fracture
  • Any sign of basal skull fracture (haemotympanum, 'panda' eyes, cerebrospinal fluid leakage from the ears or nose, Battle's sign)
  • Post-traumatic seizure
  • Focal neurological deficit
  • >1 episode of vomiting.
Practical tip
Always suspect head injury in patients who are withdrawing from alcohol; have a low threshold for requesting a CT head. Alcohol intoxication is an independent risk factor for a positive finding on CT head following head injury.[116] Patients who drink heavily are more likely to bleed after a head injury due to deranged clotting and thrombocytopenia.
	• positive if significant head injury

chest x-ray Consider if there are signs of respiratory distress. • Co-existing pneumonia is common in patients with alcohol withdrawal.[117] • There is also the possibility of aspiration, especially in people with reduced consciousness or those who have had seizures.[118]	• consolidation if pneumonia present
ECG Perform in patients with tachycardia to look for arrhythmias. These include atrial fibrillation (AF) and ventricular tachyarrhythmias.[119]	• tachyarrhythmias (including AF

Test	Result
	and ventricular tachyarrhythmias)
amylase/lipase Measure if there is abdominal pain, diarrhoea, or nausea and vomiting.[120] [121] • Elevated levels may indicate acute pancreatitis which is a complication of heavy alcohol use.[120] See our topic *Acute pancreatitis*.	• elevated in acute pancreatitis
ammonia Consider in all patients with an altered level of consciousness and signs of liver disease [122] • Elevation may indicate liver failure [122]	• elevated in acute liver failure
lumbar puncture Perform a lumbar puncture if you suspect subarachnoid haemorrhage (SAH) and the initial CT head is normal or if you suspect central nervous system (CNS) infection.[57] [123] • Consider CNS infection or SAH if symptoms of confusion are worsening or failing to improve despite treatment for alcohol withdrawal, especially if the patient has a headache, fever, or neck stiffness. • Treat empirically if there is diagnostic uncertainty before waiting for lumbar puncture results.[124]	• positive in CNS infection or SAH
electroencephalography (EEG) Perform in all patients with first presentation of an alcohol withdrawal seizure or when there is a new seizure pattern in patients with a known history of alcohol-related seizures (e.g., focal seizures or status epilepticus).[58] • Use EEG to help confirm the seizure has ended, particularly if you suspect ongoing subtle seizures in an unresponsive or anaesthetised patient.[58] • The incidence of EEG abnormalities is lower with alcohol withdrawal seizures (AWS) than other causes of seizures.[3] • Do not perform an EEG if the patient has had previous comprehensive investigation of their seizures and the pattern of current seizures is consistent with past events.[58] **Practical tip** Access to EEG is limited and it is not commonly used outside of the intensive care setting. **Evidence: Use of EEG in alcohol withdrawal seizures**	• may be normal in alcohol withdrawal seizures • abnormalities (slow or epileptiform activity) suggest that the seizure may be due to other causes apart from alcohol withdrawal[3]

Test	Result
There is limited evidence to support either the use of EEG in alcohol withdrawal seizures or the notion that EEG monitoring independently improves outcome in convulsive status epilepticus (SE). • However, EEG can contribute prognostic information. Continuing electrographic status is associated with worse outcomes in convulsive SE; some studies have shown that periodic epileptiform discharges are associated with a worse outcome independent of the cause of SE.[125] [126]	
blood-borne virus screen Order if you suspect hepatitis B, hepatitis C, or HIV infection in the history or on examination.	• positive if hepatitis B, hepatitis C, or HIV present

Differentials

Condition	Differentiating signs / symptoms	Differentiating tests
Sympathomimetic intoxication	• Several drug intoxications can produce sympathomimetic effects including diaphoresis, hypertension, tachycardia, hyperthermia, agitation, and seizure. • Excited delirium syndrome can result in sudden cardiac arrest.	• This is a clinical diagnosis.
Encephalitis	• Patients usually present with abnormalities of the brain parenchyma, which may include but are not limited to hemiparesis, sensory motor deficits, and confusion/ disorientation.	• Lumbar puncture, blood cultures, and FBC to assess leukocytosis or leukopenia; electrolyte panel to assess for abnormal electrolytes such as hyponatraemia. Polymerase chain reaction and serology testing can be performed based on suspected pathogens.
Meningitis	• Fever, nuchal rigidity, and change in mental status are common features although not all patients present with this triad. Other features include but are not limited to photophobia, skin rash, or cranial nerve palsies.	• Lumbar puncture, blood cultures, and FBC to assess leukocytosis or leukopenia; electrolyte panel to assess for electrolyte abnormalities such as hyponatraemia.
Hypoglycaemia	• Symptoms include but are not limited to tremor, anxiety, palpitations, and neuroglycopenic symptoms, such as drowsiness, seizure, and loss of consciousness.	• Symptoms commonly occur when blood glucose levels fall <55 mg/dL, and cognitive dysfunction can be seen in normal subjects at levels <50 mg/dL.[138] [139]
Wernicke's encephalopathy	• Likely clinical features are confusion, ataxia, and ophthalmoplegia.	• This is a clinical diagnosis. There are no tests that are available in the emergency setting. Routine work-up for acute delirium should be performed to rule out other causes. • CT or MRI of the brain may help to exclude other causes and show structural lesions in the mid-brain and periventricular region. Diagnostic imaging should not be used to determine

Condition	Differentiating signs / symptoms	Differentiating tests
		the diagnosis of Wernicke's encephalopathy in an emergency setting.[54] [55]
Head injury	• Patient or witness report of injury, in particular dangerous mechanisms (e.g., a pedestrian or cyclist struck by a motor vehicle, an occupant ejected from a motor vehicle, or a fall from a height of >1 metre or 5 stairs); retrograde amnesia; loss of consciousness; may cause seizures.[36] • Always suspect head injury in patients who are withdrawing from alcohol; have a low threshold for requesting a CT head.	• Request a CT head in patients with suspected head injury plus at least one of the following:[36] Glasgow Coma Scale (GCS) <13 on initial assessment in the emergency department ; GCS <15 at 2 hours after the injury on assessment in the emergency department; an open or depressed skull fracture; any sign of basal skull fracture (haemotympanum, 'panda' eyes, cerebrospinal fluid leakage from the ear or nose, Battle's sign); focal neurological deficit; post-traumatic seizure; >1 episode of vomiting.
Alcoholic ketoacidosis	• A metabolic complication of alcohol use and starvation characterised by hyperketonaemia and anion gap metabolic acidosis without significant hyperglycaemia. Causes nausea, vomiting, and abdominal pain.[104] • Present in 25% of patients who are admitted to hospital with an alcohol-related disorder.	• Anion gap metabolic acidosis on blood gas. • Elevated blood ketones. • No significant hyperglycaemia.
Hepatic encephalopathy	• Patients present with sleep disturbances and/or neurological symptoms such as bradykinesia, asterixis, or focal neurological symptoms.	• Abnormal liver function tests. • Electrolyte abnormalities (e.g., hyponatraemia). • Elevated ammonia levels.
Benzodiazepine withdrawal	• Symptoms are subtle and depend on the half-life of the medication. Onset may vary from 2 days to a week. Symptoms include anxiety, tremors, hallucinations, delusions, seizures, and hypothermia.[140]	• This is a clinical diagnosis.
Opioid withdrawal	• Symptoms vary from mild drug craving to abdominal	• This is a clinical diagnosis.

Condition	Differentiating signs / symptoms	Differentiating tests
	cramps, autonomic hyperactivity, rhinorrhoea, nausea, vomiting, and diarrhoea.[140]	
Anticholinergic poisoning	• Ingestion of xenobiotic with anticholinergic property. • Symptoms include mydriasis, tachycardia, flushed skin, urinary retention, dry skin, hallucination/delirium.[140]	• This is a clinical diagnosis.
Thyrotoxicosis	• Is more common in women in early adulthood and is characterised by heat intolerance, muscle weakness, and proptosis that helps to distinguish from other diseases. Nervousness, gastrointestinal hypermotility, hair loss, and cardiovascular manifestations are common.[141]	• Low levels of thyroid-stimulating hormone and elevated triiodothyronine (T3) and thyroxine (T4) in Graves' disease and elevated T3 in thyroid toxicosis. A radioactive iodine scan is helpful in identifying the pattern of uptake in the thyroid gland.
Alcohol-induced psychotic disorder with hallucinations	• Previously known as alcoholic hallucinosis. A rare condition in chronic heavy drinkers. Characterised by the presence of hallucinations that are a direct consequence of alcohol use.[142] Symptoms do not occur exclusively during hypnogogic or hypnopompic states, and are not related to other causes (e.g., epilepsy with visual symptoms, schizophrenia).[142]	• Accepted criteria for diagnosis come from the International Statistical Classification of Diseases and Related Health Problems, 11th revision (ICD-11).[142]
Schizophrenia	• Onset is usually insidious and is preceded by social withdrawal, lack of interest, poor hygiene, and bizarre thinking. Onset is usually in early adulthood.[143]	• Accepted criteria for diagnosis come from the Diagnostic and Statistical Manual for Mental Disorders, fifth edition, text revision.[137]
Somatisation disorders	• Somatic symptoms in a patient with no medical findings (e.g., pseudoseizures). • Usually associated with anxiety or affective disorders.[144] [145]	• There are no diagnostic tests for distinguishing these conditions.

Criteria

Clinical Institute Withdrawal Assessment for Alcohol scale, revised version (CIWA-Ar) or Glasgow Modified Alcohol Withdrawal Scale (GMAWS)

Use a validated scoring system, such as CIWA-Ar ([Clinical Institute Withdrawal Assessment of Alcohol, revised]) or GMAWS ([Glasgow Modified Alcohol Withdrawal Scale]), with your clinical judgement to assess all patients with alcohol withdrawal, to gauge severity, guide management, and monitor patients during treatment.[1] [2] [3]

- Check local protocols for recommendations on which scale to use and cut-off values for mild, moderate, and severe withdrawal. GMAWS is an alternative to CIWA-Ar for use in an acute hospital setting.[33]
- Assign a score to each item, based on your observations and the patient's answers to structured questioning.
    - Speak slowly and clearly; reword questions if needed.
- Add up the number of points to reach a total.

Use the total CIWA-Ar or GMAWS score to:[2] [3]

- Determine which patients need drug treatment
    - In general, patients with a CIWA-Ar score <10 or GMAWS <2 do not require drug treatment. However they may require a period of monitoring and supportive treatment.[3]
- Decide whether a patient is suitable for outpatient management
- Monitor patients during treatment.

Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) criteria for alcohol withdrawal syndrome[137]

A. Cessation of or reduction in alcohol intake, which has previously been prolonged/heavy.

B. Criterion A, plus any 2 of the following symptoms developing within several hours to a few days:

- Autonomic hyperactivity
- Worsening tremor
- Insomnia
- Vomiting and nausea
- Hallucinations or illusions, visual, tactile or auditory
- Psychomotor agitation
- Anxiety
- Generalised tonic-clonic seizures.

C. The above symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

D. The above symptoms are not attributable to other causes; for example, another mental disorder, intoxication, or withdrawal from another substance.

Specify if with perceptual disturbances - hallucinations (usually visual or tactile) occur with intact reality testing, or if auditory, visual, or tactile illusions occur in the absence of a delirium.

DSM-5-TR diagnostic criteria for alcohol withdrawal delirium[137]

A. Decreased attention and awareness

B. Disturbance in attention and awareness developed over a short period of time and represents a change from the normal level, fluctuating in severity during the day

C. An additional disturbance in memory, orientation, language, visuospatial ability, or perception

D. No evidence of coma or other evolving neurocognitive disorder severity during the day that could account for the disturbances described in criteria A and C

E. History indicates that the disturbance is attributable to alcohol withdrawal.

Screening

Use validated screening tools to: (i) identify any patient with alcohol-use disorder and (ii) assess the level of alcohol dependence in those who have tested positive for alcohol misuse.

- Screen the patient for alcohol-use disorder using a formal assessment tool such as AUDIT-C, FAST, PAT, or AUDIT.[2] Decide which to use based on local protocols, the setting of care, and your preference.
    - AUDIT-C ([Alcohol Use Disorders Identification Test - Consumption])[2]
        - A total score of ≥5 is a positive screen.
    - FAST ([Fast Alcohol Screening Test])
        - Conceived for use in emergency departments but can be used in a wide variety of settings.[3]
    - PAT([Paddington Alcohol Test 2011])
        - Takes less than a minute to perform and useful in busy clinical settings.[64]
    - AUDIT ([Alcohol Use Disorders Identification Test])
        - The full version of AUDIT; takes longer to perform than the other screening tools and therefore may not be suitable in an acute hospital setting.[2]
- Identify patients who have tested positive for alcohol misuse and are at risk of alcohol withdrawal by assessing their level of alcohol dependence. AUDIT-C, FAST, PAT, and AUDIT only identify alcohol-use disorder and do not predict which patients are at risk of alcohol withdrawal. Decide which

screening tool to use based on local protocols and your preference. Use either SAD-Q or the CAGE questionnaire.

- SAD-Q [Severity of Alcohol Dependence Questionnaire] [32]
  - This can help guide drug doses for treatment as well as identifying those at risk of alcohol withdrawal delirium (also known as delirium tremens).
  - A chlordiazepoxide detoxification regimen is usually indicated for anyone who scores ≥16.
- CAGE questionnaire[3] [5]
  - Ask four questions:[42]
    - C: Have you felt the need to cut down on your drinking?
    - A: Have you ever felt annoyed by someone criticising your drinking?
    - G: Have you ever felt bad or guilty about your drinking?
    - E: Have you ever had an eye-opener - a drink first thing in the morning to steady your nerves?
  - The test is considered positive if score ≥2.
  - This is a brief and effective test for lifetime alcohol abuse or dependence. It is commonly used in clinical practice.
  - However, it fails to detect binge drinking and is less sensitive in screening for mild to moderate alcohol withdrawal than other screening tools. It also does not distinguish between active and past problem drinking.[3] [5] [76]

Take account of the amount of alcohol that the patient reports drinking prior to admission/assessment as well as the result of SAD-Q/CAGE screening.[3]

- Ask about changes in drinking patterns, at least during the previous 5 days, as well as the time of the patient's last drink.[3]
- Consider other diagnoses if the patient has consumed alcohol in the last 6 hours as alcohol withdrawal is unlikely within this timeframe. However, it is important to remember that patients can experience withdrawal symptoms even if their blood alcohol level has not reached zero.

Recommendations

Urgent

Give a **benzodiazepine** first line to all patients with symptoms of alcohol withdrawal and with **CIWA-Ar score ≥10 (** [Clinical Institute Withdrawal Assessment of Alcohol, revised] **) or GMAWS score ≥2#(** [Glasgow Modified Alcohol Withdrawal Scale] **).** [1] [2] [33]

- Treat features of severe alcohol withdrawal early and involve senior support and consider referring the patient to critical care. Always give intravenous or high-dose benzodiazepines in a critical care environment.
    - **Alcohol withdrawal delirium** (also known as delirium tremens): this is a life-threatening medical emergency requiring urgent treatment.
        - Give oral lorazepam or diazepam first line if tolerated. Switch to intravenous lorazepam if symptoms persist.
        - Add an antipsychotic if the patient fails to improve despite adequate treatment with intravenous lorazepam.
        - Consider phenobarbital if symptoms are not controlled despite a benzodiazepine and an antipsychotic.
        - Consider rapid tranquilisation if symptoms are not controlled despite all of the above treatments.
            - Ensure anaesthetic/intensive care support or staff trained in airway management and sedation are present.
                - Use either midazolam, ketamine, or propofol depending on your preference/training and in line with local protocols.
    - **Alcohol withdrawal seizures:**these patients require urgent treatment to reduce the likelihood of further seizures.
        - Ensure a patent airway immediately.
        - Give intravenous lorazepam as a single dose. Give a second dose after 10 minutes if seizures continue. Always follow your local protocol.
- Use a benzodiazepine regimen first line for all patients without alcohol withdrawal delirium or active seizures.
    - In patients with no hepatic impairment, delirium, or dementia (and who are able to tolerate oral medication), give a long-acting oral benzodiazepine such as chlordiazepoxide, or less preferably diazepam.[1] [2]

- In patients with hepatic impairment, delirium, or dementia, or those who cannot tolerate oral medication, give a short-acting benzodiazepine such as lorazepam.[1] [2]

- Consider a **CT head** for all patients with suspected significant head injury, altered cognition, or seizures.[36] [37] [38] [39] [40]

Detect and treat co-existing medical and psychiatric illness.[1] [2]

Key Recommendations

Supportive care

Manage patients in a quiet room and use a calm approach.[3] Monitor closely for deterioration.

Rehydrate the patient.

- Give intravenous fluids if needed.

Correct any electrolyte imbalances.[104]

- There may be low levels of potassium, magnesium, calcium, and phosphate.
- Consult local protocols to determine the doses for electrolyte replacement.[104] [146]

Correct hypoglycaemia and continue to monitor blood glucose levels.

- If you give glucose, give it at the same time or after thiamine. However, do not delay glucose for life-threatening hypoglycaemia while waiting for thiamine administration.

Ensure regular observation, especially if pharmacological treatment is given.

Acute pharmacological treatment

Not all patients with symptoms of alcohol withdrawal will need acute pharmacological treatment.

- Use your clinical judgement to decide which patients need treatment.
- Do not routinely give treatment if the patient scores <10 on CIWA-Ar score or <2 on GMAWS.

    - Patients with mild to moderate alcohol withdrawal symptoms (CIWA-Ar score <10 or GMAWS <2) can generally be managed with supportive care only.[3]
    - Consider monitoring these patients for 4 to 6 hours to ensure no worsening withdrawal symptoms and to provide supportive care.

Review all patients after they receive a second dose of any benzodiazepine.

- If they are still highly symptomatic, request a senior review.
- Review the diagnosis of alcohol withdrawal and ensure other causes have been considered and ruled out.

Benzodiazepine-resistant alcohol withdrawal

In practice, for patients who need approximately ≥130 mg of chlordiazepoxide (or equivalent dose of another benzodiazepine) in the first hour of treatment:

- Involve senior support and consider causes other than alcohol withdrawal
- Consider using a higher dose of a benzodiazepine (or switch to intravenous lorazepam) and add an antipsychotic if the patient still has psychotic symptoms
    - Always give intravenous or high-dose benzodiazepines in a critical care environment
- Escalate to critical care for sedation or anaesthesia if symptoms persist or worsen despite use of a benzodiazepine and/or antipsychotic
- Consider using phenobarbital and rapid tranquilisation if psychotic symptoms continue.[147] [148] [149]

Nutritional support

Give thiamine (vitamin B1) to any patient with acute alcohol withdrawal to prevent or treat **Wernicke's encephalopathy.** [1] [2] [3] Thiamine can be given orally or parenterally.

- Give this treatment in doses towards the upper end of the British National Formulary range. In an emergency department setting or where a harmful or dependent drinker is admitted with alcohol withdrawal or an acute illness, this would usually be parenteral thiamine, with oral thiamine treatment following on from this. [1] [2] [45] Ensure that you check local guidance and formularies as these may advise specific preparations and doses.

Monitoring

Monitor all patients who have been admitted every hour until they are stable; in particular:

- Use the CIWA-Ar score or GMAWS to monitor response to drug treatment
- Check blood glucose
- Check vital signs using a validated scoring system recommended by your local protocols, such as the National Early Warning Score 2 (NEWS2).[150] [RCP: National Early Warning Score 2]

Outpatient management

Refer all people who need assisted alcohol withdrawal to specialist alcohol services for assessment for community-based alcohol withdrawal.[32]

- The patient should **not be advised to suddenly stop or reduce their alcohol intake** while waiting for outpatient services as this could precipitate severe withdrawal symptoms.[1]
- If possible, the patient should gradually reduce their intake over several weeks/months. Advise them to decrease their level of drinking by not more than 25% every 2 weeks.

Do not prescribe medication to patients being managed in the community unless they have adequate assessment and support as successful withdrawal is unlikely and there are considerable associated clinical risks.[10]

Full Recommendations

Treatment goals

Use the lowest possible dose of medication for the minimum possible time (to avoid over-sedation) to:

- Provide relief of subjective symptoms
- Prevent severe manifestations of alcohol withdrawal such as seizures and alcohol withdrawal delirium.

Detect and treat any concurrent medical or psychiatric illness.

Supportive care

General principles

Manage patients in a quiet room with low lighting and minimal stimulation.

- Use a calm approach and bear in mind that the patient may need frequent verbal reassurance.
- If possible, restrict the patient's caffeine intake; ensure they remain hydrated.[3]

Correct metabolic abnormalities

Rehydrate the patient. Give intravenous fluids if needed.

- The patient may be dehydrated from vomiting, sweating, or diarrhoea, or secondary to a concurrent acute medical illness.

Correct any electrolyte imbalances (most notably in patients with chronic alcohol-use disorder).

- Consult local protocols to determine the doses for electrolyte replacement.[104] [146]

More info: Electrolyte deficiencies

Electrolyte deficiencies are common in people with chronic alcohol-use disorder.[104]

- They can cause life-threatening cardiac arrhythmias; always perform an ECG on patients with electrolyte deficiencies.[105] [106] [107] [108]
- In people admitted to hospital with chronic alcohol-use disorder, plasma magnesium, phosphate, and potassium concentrations may be normal or only slightly reduced on admission, only to decrease over several days. This is owing to an inward cellular shift that unmasks decreased total-body stores.[104]

Magnesium

Give intravenous magnesium according to local protocols if serum magnesium is <0.5 mmol/L (<1 mEq/L) or if the patient is symptomatic.[151]

- Monitor the patient's magnesium level:
  - Every day if receiving intravenous replacement
  - Every week if receiving oral replacement.

Practical tip

Hypokalaemia and hypocalcaemia will not resolve until adequate magnesium replacement is given. Be aware that following intravenous replacement, the magnesium level will rise initially but then falls over the following 72 hours, when a repeat magnesium infusion may be required.

See our topic *Assessment of magnesium deficiency*.

Potassium

Give intravenous potassium according to local protocols for severe hypokalaemia (serum potassium <2.5 mEq/L) or in patients who are symptomatic.[152]

See our topic *Assessment of hypokalaemia*.

Calcium

Give intravenous calcium gluconate according to local protocols for severe hypocalcaemia (<1.9 mmol/L [<7.5 mg/dL]), or if there is tetany, respiratory failure, arrhythmia, or seizures.[108]

- Cardiac arrhythmias can occur if calcium gluconate is given too quickly; monitor using ECG.

See our topic *Assessment of hypocalcaemia*.

Phosphate

Give intravenous phosphate according to local protocols if the patient is critically unwell or unable to tolerate oral intake, or if serum phosphate is <1.5 mg/dL.[153]

- Do not give intravenous phosphate if there is pre-existing hypocalcaemia as this can worsen the hypocalcaemia.

More info: Risks of phosphate replacement

Other risks of intravenous replacement are seizures, ECG changes and shock, and overtreatment resulting in hyperphosphataemia and hyperkalaemia. Therefore, monitor calcium, potassium, phosphate, magnesium, and creatinine levels (e.g., every 6 hours) as well as cardiac function using ECG.[153]

Glucose

Correct hypoglycemia by giving:

- Oral glucose, either in liquid form or as granulated sugar or sugar lumps, if the patient is conscious and able to tolerate oral intake [154]
- Intravenous glucose if the patient is unconscious or unable to take oral glucose[154]
- Glucagon by intramuscular or subcutaneous injection if there is no intravenous access.[155]

If you give glucose, give it at the same time or after thiamine. However, do not delay glucose for life-threatening hypoglycaemia while waiting for thiamine administration.

- Some evidence suggests that prolonged glucose supplementation without the addition of thiamine can be a risk factor for the development of Wernicke's encephalopathy.[100] [101] [102]

Treat concurrent acute medical illness

Assess for features of acute medical illness and chronic or decompensated liver disease due to alcohol-use disorder. Be aware that all these patients need admission.

- Commonly associated acute illnesses include:
    - Pneumonia
    - Pancreatitis
    - Hepatitis
    - Gastritis (see *More info: Management of gastritis* below).
- Features of chronic or decompensated liver disease tend to be late signs of liver disease and therefore may not be present in all patients. These patients should be managed by a specialist. These features include:
    - Hepatomegaly
    - Jaundice
    - Ascites[92]
    - Caput medusa[92]
    - Palmar erythema[92]
    - Hepatic encephalopathy.

See our topics *Alcoholic liver disease*, *Community-acquired pneumonia*, *Acute pancreatitis*, and *Gastritis* for more information.

More info: Management of gastritis

Gastritis secondary to heavy alcohol use is common in patients with alcohol withdrawal. It is important to recognise and treat this. Alleviating the unpleasant symptoms will help keep the patient calm and settled, therefore reducing the risk of them absconding.

Use a proton-pump inhibitor (e.g., omeprazole) for treatment in the acute setting. If there is persistent hypomagnesaemia or hypokalaemia, consider switching to an H2 receptor antagonist (e.g., ranitidine).[93] [94]

Acute pharmacological treatment

Use your clinical judgement, in addition to the patient's CIWA-Ar ([Clinical Institute Withdrawal Assessment of Alcohol, revised]) or GMAWS ([Glasgow Modified Alcohol Withdrawal Scale]) score, to decide if they need pharmacological treatment. Give medication to any patient with **CIWA-Ar score ≥10 or GMAWS ≥2.** [1] [2] [33]

Use a **benzodiazepine** first line if a patient needs pharmacological treatment.[1] [2] [Evidence B] [Evidence B]

- Always give intravenous or high-dose benzodiazepines in a critical care environment.
- Choose a drug and dose regimen based on the indication, severity of symptoms, and patient factors (e.g., presence of hepatic impairment, delirium, or dementia; ability to tolerate oral medication; inpatient vs. outpatient). Follow local protocols.

Not all patients with symptoms of alcohol withdrawal will need acute pharmacological treatment.

- Do not routinely give pharmacological treatment to the patient if they have CIWA-Ar score <10 or GMAWS score <2. Patients with mild to moderate alcohol withdrawal symptoms can generally be managed with supportive care only.[3]

Even if the patient scores <10 on CIWA-Ar or <2 on GMAWS, consider observing them for 4 to 6 hours prior to discharge to monitor for worsening symptoms.

Tailor the type of medication and dose based on the individual patient's requirements. Take into account patient factors including:[2]

- Severity of alcohol dependence
- Severity of the alcohol withdrawal symptoms
- Comorbidities.

More info: Benzodiazepines

Benzodiazepines are used to control psychomotor agitation and prevent progression to more severe withdrawal symptoms. They may also be used specifically for the treatment of alcohol withdrawal seizures and alcohol withdrawal delirium.

Benzodiazepines can cause respiratory depression, particularly at higher doses or when given parenterally; therefore, facilities for managing respiratory depression with mechanical ventilation must be immediately available.

Alcohol withdrawal delirium

Alcohol withdrawal delirium (also known as delirium tremens) is a **medical emergency** requiring urgent treatment.

Involve early senior support and consider referring the patient to **critical care**.

- Alcohol withdrawal delirium is fatal in 15% to 20% of patients if untreated.[34] [35] Appropriate early management reduces mortality to around 1%.[9]

Give an oral **benzodiazepine** (either lorazepam or diazepam) if the patient can tolerate this.[1] [2] If symptoms persist despite oral treatment or if the patient cannot tolerate oral medication:

- Switch to intravenous lorazepam
- Add an antipsychotic[45][156]
    - Use an antipsychotic only when an adequate dose of benzodiazepine has been given and the patient has not had an adequate response
    - Haloperidol and olanzapine are commonly used.

Consider phenobarbital if psychotic symptoms continue despite use of a benzodiazepine and an antipsychotic.[1]

Evidence: Use of phenobarbital in alcohol withdrawal

There is growing evidence to suggest that phenobarbital may be an appropriate and effective therapeutic option for alcohol withdrawal, particularly when symptoms are severe.

- One systematic review concluded that although barbiturates show potential for use in the emergency department and for severe withdrawal in intensive care, further evidence is needed to clarify their role in treating alcohol withdrawal. It also showed that barbiturates caused relatively low rates of respiratory depression.[147]
- Evidence has also shown that, unlike benzodiazepines, phenobarbital doesn't cause paradoxical reactions.[157]

Involve critical care if alcohol withdrawal delirium continues despite administration of a high dose of a benzodiazepine plus an antipsychotic and phenobarbital.[158]

- These patients will require rapid tranquilisation with midazolam, ketamine, or propofol.[159] [160]
    - Decide which drug to use based on your choice/training and according to local protocols.
    - Ensure that intensive care/anaesthetics or staff trained in sedation and airway management are present.

Alcohol withdrawal seizures

These patients require urgent treatment to reduce the likelihood of further seizures.

Ensure a patent airway immediately.

Use a short-acting benzodiazepine (e.g., lorazepam).[1]

- Give intravenous lorazepam as a single dose. Give a second dose after 10 minutes if seizures continue. Always follow your local protocol.
- Check blood glucose in all patients with seizures.[56]

Do not use anticonvulsants such as phenytoin.[1] [2]

Evidence: Management of alcohol withdrawal seizures

Lorazepam is effective in preventing and treating alcohol withdrawal seizures.

It is vital to treat patients with alcohol withdrawal seizures as soon as possible to prevent subsequent seizures.

- Chronic heavy alcohol consumption is an established dose-related exposure risk for the occurrence of seizures. Evidence has shown that following a withdrawal seizure, the recurrence risk within the same withdrawal episode is 13% to 24%.[161]
- Lorazepam has been shown to reduce recurrence risk significantly.[162]
- Phenytoin did not prevent relapses in patients who had one or more seizures during the same withdrawal episode.[163]

Status epilepticus (SE) is most commonly due to alcohol withdrawal but also has many other causes.[3]

- One study looked at management of SE and showed that lorazepam may be superior to diazepam for the treatment of out-of-hospital SE.[164]
- In another study comparing four treatments for SE, lorazepam was considered easier to use but not more effective than diazepam, phenobarbital, or phenytoin.[165]

Alcohol withdrawal without alcohol withdrawal delirium or active seizures

Give a **benzodiazepine** first line to any patient who needs pharmacological treatment.[1] [2] [Evidence B] [Evidence B]

Benzodiazepine dosing regimen

Follow local protocols to determine dosing regimen. See *Choice of benzodiazepine* below for more information about doses of specific benzodiazepines.

- A benzodiazepine may be given using a **fixed-dose** regimen or a **symptom-triggered** regimen.
    - In the UK, a fixed-dose regimen is generally preferred for any patient being managed on a general inpatient ward. A symptom-triggered regimen may put these patients at risk of being under-treated if the regimen is not followed closely. It requires more regular observation and may only be practical in environments that have facilities for close monitoring, such as the emergency department or intensive care.

- Use a symptom-triggered regimen if the patient is in hospital and can be monitored closely or in settings where 24-hour assessment and monitoring are available (e.g., the emergency department or intensive care).[1]
    - A symptom-triggered regimen involves tailoring the drug regimen according to the severity of withdrawal and any complications.[1] Note that a symptom-triggered regimen may not be appropriate for patients who are confused, delirious, psychotic, or speak poor English as they will not be able to score on anxiety, orientation and clouding of sensorium, or tactile, auditory, and visual disturbances. For these patients, consider using a fixed-dose regimen instead.

- Use a fixed-dose regimen if the patient is being managed in the community, or if the patient is being managed in hospital and a symptom-triggered regimen is not appropriate (e.g., on a general inpatient ward).[32]
    - Start treatment with a standard dose, not defined by the level of alcohol withdrawal; gradually reduce the dose to zero over 7 to 10 days according to a standard protocol.[32]
    - Titrate the initial dose of medication to the severity of alcohol dependence and/or regular day-to-day level of alcohol consumption.[32] Check local guidelines for dose recommendations.

Evidence: Use of benzodiazepines for alcohol withdrawal

Benzodiazepines have the best evidence base in the treatment of alcohol withdrawal, followed by anticonvulsant s [166] [167] [168]

- A Cochrane review summarised evidence from 64 randomised controlled trials evaluating the effectiveness and safety of benzodiazepines in the treatment of alcohol withdrawal symptoms. The available data showed that benzodiazepines are effective against alcohol withdrawal seizures, compared with placebo, and have a potentially protective benefit for many outcomes when compared with other drugs. Data on safety outcomes are sparse.[168]
- Among the benzodiazepines, chlordiazepoxide has been shown to have a slight advantage over other benzodiazepines or anticonvulsants.[168] [169] There is not sufficient evidence in favour of anticonvulsants being used in place of benzodiazepines for the treatment of alcohol withdrawal. Some evidence has shown there is no significant difference in rates of admission to hospital when patients are given either lorazepam or diazepam in the emergency department.[170]
- Benzodiazepines commonly cause delirium. One study of intubated patients found that nearly all patients who received >20 mg of lorazepam developed delirium. Less commonly, lower doses of a benzodiazepine can cause agitated delirium, known as a paradoxical reaction.[171]

Evidence: Symptom-triggered regimen versus fixed-dose regimen

S ***ymptom-triggered regimens have been reported to be as effective as fixed-dose regimens while also resulting in lower overall dose and shorter treatment times.***

- Check local protocols for drug and dose recommendations, adjusting according to individual patient characteristics. The drugs and doses used in these trials might not be appropriate for your patient.
- In a randomised-controlled trial of 101 patients, the symptom-triggered group received 100 mg of chlordiazepoxide, whereas the fixed-dose group received 425 mg of chlordiazepoxide. The median duration of treatment in the symptom-triggered group was 9 hours, compared with 68 hours in the fixed-dose group. There were no significant differences in the severity of withdrawal during treatment or in the incidence of seizures or alcohol withdrawal delirium.[47]

Choice of benzodiazepine

Use a long-acting benzodiazepine in patients who do not have significant hepatic impairment, delirium, or dementia, and who can tolerate oral medication.[1] [172]

- Chlordiazepoxide is commonly used, but diazepam is also an option; check your local guidelines.
    - Diazepam is less commonly used and is slowly being phased out of use as it has a higher potential for abuse than chlordiazepoxide.[173]
- The dose of chlordiazepoxide depends on the severity of alcohol withdrawal symptoms. The patient's response to treatment should always be regularly and closely monitored.

- It is common in practice to prescribe 'as required' (PRN) doses of chlordiazepoxide in addition to the regular dose.
- A dose reduction is recommended in older people and in patients with hepatic impairment.

Use a short-acting benzodiazepine in patients with significant hepatic impairment, delirium, or dementia, or those who cannot tolerate oral medication.

- Lorazepam is most commonly used in practice. However, it may increase the risk of seizures because it has a shorter half-life than chlordiazepoxide [174]

More info: Reduced dose of chlordiazepoxide

In practice, 'as required' (PRN) doses of chlordiazepoxide are commonly prescribed in addition to the regular dose.

- PRN doses are considered safe, even in a patient requiring the higher doses of chlordiazepoxide recommended for severe dependence, as long as the patient still needs treatment based on their CIWA-Ar or GMAWS score.

Use the 'start low and go slow' rule for older patients to minimise adverse effects associated with benzodiazepines (e.g., over-sedation, confusion, and ataxia). It is good practice to start with half the recommended dose and adjust as needed according to response.[175] Use half the recommended dose in patients with mild or moderate hepatic impairment as metabolism is impaired in these patients.

- Reduce the dose of chlordiazepoxide (or switch to a short-acting benzodiazepine such as lorazepam) if the patient becomes drowsy, as this is evidence that the chlordiazepoxide is accumulating.

Review and monitoring

Review the patient after they have received a **second dose** of any benzodiazepine. If the patient is still highly symptomatic, request a senior review.

- Review the diagnosis of alcohol withdrawal in these patients and consider other causes.

If the patient is receiving a symptom-triggered regimen:

- Monitor the patient closely and regularly[1]
- Continue treatment only for as long as the patient is showing withdrawal symptoms.[32]

If the patient is receiving a fixed-dose regimen:

- Assess the patient every day to ensure that they are not oversedated. Adjust the dose according to response
- In practice, it is common to avoid giving a dose if the patient is asleep. Review the dosing regimen if more than one dose is missed. More than one missed dose should trigger a dose review.

If **alcohol withdrawal delirium** or **seizures** develop while the patient is being treated for acute alcohol withdrawal, review the patient's benzodiazepine regimen (if they are on one).[1]

- Continue the patient's benzodiazepine regimen concurrently with any acute treatment required for alcohol withdrawal delirium or seizures. In patients who are already on an oral benzodiazepine regimen, additional intravenous doses of a benzodiazepine for the treatment of alcohol withdrawal delirium or seizures may be used concurrently.
- In practice, many patients with alcohol withdrawal delirium or seizures may not tolerate oral medication; restart the patient's benzodiazepine regimen as soon as they can tolerate this.

In the community

Do not give a benzodiazepine to patients being managed in the community unless there are adequate specialist facilities to monitor and support them. However, if a benzodiazepine is suitable:

- Monitor the patient every other day and involve a family member or carer to oversee the administration of medication[32]
- Adjust the dose if severe withdrawal symptoms or over-sedation occur.[32]

Avoid giving the patient large quantities of medication to take home to prevent overdose or diversion. Do not supply more than 2 days' medication at any time.[32]

Carbamazepine or clomethiazole

Guidelines from the National Institute for Health and Care Excellence (NICE) in the UK recommend carbamazepine (an anticonvulsant) or clomethiazole (a sedative/hypnotic) as alternatives to benzodiazepines, but they are rarely used in practice.[1]

- Indications may include intolerance or allergy to, dependence on, or shortage of benzodiazepines.
- Seek senior advice if you are considering using these drugs.

Clomethiazole should only be used in hospital under close supervision or, in exceptional circumstances, on an outpatient basis by specialist units where the dose must be monitored closely every day.[1]

Use with caution in patients who:[1]

- Are being managed in the community
- Continue to drink or abuse alcohol. Alcohol combined with clomethiazole, particularly in patients with cirrhosis, can lead to fatal respiratory depression even with short-term use.

Evidence: Use of carbamazepine

Anticonvulsants such as carbamazepine have not been proven to be more effective in treating alcohol withdrawal than benzodiazepines.

- Anticonvulsants may be considered in mild withdrawal states. They are less likely than benzodiazepines to cause sedation, or lead to dependence or abuse. In one study, carbamazepine also appeared to decrease the craving for alcohol after withdrawal.[176]
- However, anticonvulsants have not been shown to prevent seizures or alcohol withdrawal delirium in alcohol withdrawal states and they are not recommended for severe alcohol withdrawal.[169]

Evidence: Use of clomethiazole

There is limited evidence comparing benzodiazepines with clomethiazole.

- One study compared clomethiazole to diazepam in 79 patients in intensive care. It showed that they were equally effective in reducing the symptoms of alcohol withdrawal. However it also showed that patients taking clomethiazole required a shorter duration of treatment and had lower rates of complications. There is not enough evidence to recommend clomethiazole over benzodiazepines as first-line treatment; it is not suitable for patients who are being managed in the community or continue to drink alcohol.[177]

Benzodiazepine-resistant alcohol withdrawal

In practice, any patient with alcohol withdrawal who needs approximately **≥130 mg of chlordiazepoxide**(or equivalent dose of another benzodiazepine) in the **first hour of treatment** is considered to have benzodiazepine-resistant alcohol withdrawal.

- Involve senior support and consider alternative diagnoses.
- Consider using a higher dose of a benzodiazepine (or switch to intravenous lorazepam)[7]
- Add an antipsychotic if the patient continues to have psychotic symptoms.[45]
- Escalate to critical care for sedation or anaesthesia if symptoms persist or worsen despite use of a benzodiazepine and/or antipsychotic.[160]

Consider using phenobarbital and rapid tranquilisation if psychotic symptoms continue.[147] [148] [149]

Nutritional support

Give thiamine (vitamin B1) to any patient with alcohol withdrawal to prevent or treat **Wernicke's encephalopathy**.[1] [2] Thiamine can be given orally or parenterally. See our topic Wernicke's encephalopathy .

- Give this treatment in doses towards the upper end of the British National Formulary range. In an emergency department setting or where a harmful or dependent drinker is admitted with alcohol withdrawal or an acute illness, this would usually be parenteral thiamine, with oral thiamine

treatment following on from this. [1] [2] [45] Ensure that you check local guidance and formularies as these may advise specific preparations and doses.

- For any patient being admitted to hospital, after an initial parenteral dose:
    - Give further doses according to local protocols. It is important to note that the doses and route of administration for prevention and treatment differ.[1]
    - Oral thiamine treatment should follow a course of parenteral therapy for the remainder of the patient's hospital stay and throughout outpatient treatment.[1]

Practical tip

Ensure there are facilities available for treating anaphylaxis if giving parenteral thiamine.

- Potentially serious allergic adverse reactions may rarely occur during, or shortly after parenteral administration. However, this should not stop the use of parenteral thiamine in any patient who needs it via this route of administration, particularly in patients at risk of Wernicke's encephalopathy.

Evidence: Thiamine for Wernicke's encephalopathy

There is no strong evidence to support any one dose, frequency, route, or duration of treatment with thiamine for Wernicke's encephalopathy. [178] There is some theoretical and trial evidence to suggest that parenteral replacement elevates blood levels faster than oral replacement. However, it is unknown if this is clinically significant.[1]

- It is widely acknowledged that recommendations for dose and timing of thiamine in patients with alcohol-use disorder to prevent Wernicke's encephalopathy are arbitrary.
    - A Cochrane review in 2013 did not identify any strong evidence from randomised controlled trials that would help inform these decisions.[179] No high-quality data have been published since.

Monitoring treatment

Monitor all patients with moderate to severe withdrawal, or are receiving pharmacotherapy for withdrawal, every 1-4 hours until they are stable; in particular:[45]

- Use the CIWA-Ar score to monitor response to drug treatment[1] [2] [45]
- Check blood glucose
- Observe vital signs using a validated scoring system recommended by your local protocols, such as the National Early Warning Score 2 (NEWS2). [RCP: National Early Warning Score 2]

Outpatient management

Refer any patient who is dependent on alcohol and wants to stop drinking to specialist alcohol services so they can be assessed for community-based alcohol withdrawal.[32]

- **Do not advise the patient to suddenly stop or reduce their alcohol intake** while waiting for outpatient services as this could precipitate severe withdrawal symptoms.[1]
- If possible, the patient should gradually reduce their intake over several weeks/months. It is common practice to advise the patient to decrease their level of drinking by not more than 25% every 2 weeks.

Practical tip

Check which local alcohol services are available in your area when considering whether the patient is suitable for outpatient management.

- Current practice in England and Wales is inconsistent, with variable access to, and provision of, assisted alcohol withdrawal and treatment services for alcohol-use disorder and alcohol dependence.
- Even when treatment is offered, coordination of services across the various sectors is poor and can lead to substandard or inconsistent care.[180]

Do not prescribe medication to patients being managed in the community unless they have adequate assessment and support as successful withdrawal is unlikely and there are considerable associated clinical risks.[10]

A community-based alcohol withdrawal programme will vary in intensity according to the severity of the patient's alcohol dependence, available social support, and the presence of comorbidities.[32]

- This may include regular meetings with programme staff, psychological support, access to self-help groups, and family and carer support and involvement.[32]
- Avoid giving people in the community large quantities of medication to take home to prevent overdose or diversion. Prescribe for installment dispensing, with no more than 2 days' medication supplied at any time.[32]
- Monitor the patient every other day during assisted withdrawal. A family member or carer should preferably oversee the administration of medication. Adjust the dose if severe withdrawal symptoms or over-sedation occur.[32]
- Do not offer clomethiazole for community-based assisted withdrawal because of the risk of overdose and misuse.[32]

Evidence: Outpatient management of alcohol withdrawal

Evidence shows that outpatient management can be an effective, safe, and low-cost treatment for patients with mild to moderate symptoms of alcohol withdrawal.

- One study evaluated 28 patients over 2 months. At the end of the study, eight patients were deemed to have a 'good' outcome (seven were abstinent and one only drank four units on one day). Nine were considered 'improved', by either halving their alcohol consumption or halving their 'Alcohol Problems Inventory' score (this measured alcohol-related relational, occupation, legal, and medical problems), after 2 months. 'Good' and 'improved' outcomes were confirmed by measuring mean corpuscular volume and gamma-glutamyl transferase. Eleven people were 'not improved'.
    - Engagement with voluntary alcohol agencies following detoxification was associated with a better outcome.
    - The same study also calculated that inpatient management is around six times more expensive than outpatient management.[181]
- Other studies have shown that as many as 75% of patients with acute alcohol withdrawal can be managed safely in the community and that this approach is preferred by patients.[181] [182] [183]
- It has also been shown that alcohol abstinence rates at 6 months are similar after inpatient and community delivery of care.[184]

Long-term management

Give all patients a long-term plan to help them stop drinking alcohol or maintain abstinence. Management may include psychosocial interventions and use of medication.

See our topic *Alcohol-use disorder* for more information.

Treatment algorithm overview

Please note that formulations/routes and doses may differ between drug names and brands, drug formularies, or locations. Treatment recommendations are specific to patient groups: see disclaimer

Acute (summary)			
suspected alcohol withdrawal and CIWA-Ar score ≥10 or GMAWS score ≥2			
		1st	benzodiazepine or carbamazepine or clomethiazole
		plus	supportive care + treatment of concurrent acute medical illness
		plus	thiamine
		consider	airway management
	with psychotic symptoms (including refractory alcohol withdrawal delirium)	plus	antipsychotic
		consider	phenobarbital
		consider	rapid tranquilisation
suspected alcohol withdrawal and CIWA-Ar score <10 or GMAWS score <2			
		1st	supportive care + treatment of concurrent acute medical illness
		plus	thiamine
		consider	benzodiazepine or carbamazepine or clomethiazole
		consider	outpatient management

Treatment algorithm

Please note that formulations/routes and doses may differ between drug names and brands, drug formularies, or locations. Treatment recommendations are specific to patient groups: see disclaimer

Acute

suspected alcohol withdrawal and CIWA-Ar score ≥10 or GMAWS score ≥2

1st **benzodiazepine or carbamazepine or clomethiazole**

Primary options

» lorazepam: seizures: 4 mg intravenously as a single dose initially, repeat dose after 10 minutes if required; acute alcohol withdrawal or alcohol withdrawal delirium: consult local protocol for dose guidelines
A dose reduction is recommended in older people and patients with hepatic impairment.

OR

» diazepam: consult local protocol for dose guidelines
A dose reduction is recommended in older people and patients with hepatic impairment; avoid in severe hepatic impairment.

OR

» chlordiazepoxide: consult local protocol for dose guidelines
A dose reduction is recommended in older people and patients with hepatic impairment; avoid in severe hepatic impairment.

Secondary options

» carbamazepine: consult local protocol for dose guidelines

Tertiary options

» clomethiazole: consult local protocol for dose guidelines

» Use a benzodiazepine first line to any patient with CIWA-Ar score ≥10 or GMAWS ≥2, including those who have **alcohol withdrawal delirium** (also known as delirium tremens) or alcohol withdrawal **seizures**.[1] [2] [33]

MANAGEMENT

Acute

- Treat any patient with alcohol withdrawal delirium or alcohol withdrawal seizures urgently. Involve senior support and consider referring the patient to **critical care**.
- Always give intravenous or high-dose benzodiazepines in a critical care environment.
- Choose a drug and dose regimen based on the indication, severity of symptoms, and patient factors (e.g., presence of hepatic impairment, delirium, or dementia; ability to tolerate oral medication; inpatient vs. outpatient). Follow local protocols.

More info: Benzodiazepines

Benzodiazepines are used to control psychomotor agitation and prevent progression to more severe withdrawal symptoms as part of a dosing regimen. They may also be used specifically for the treatment of alcohol withdrawal seizures and alcohol withdrawal delirium. Alcohol withdrawal delirium is a medical emergency requiring urgent treatment. Any patient with alcohol withdrawal seizures also requires urgent treatment to reduce the likelihood of further seizures.

Benzodiazepines can cause respiratory depression, particularly at higher doses or when given parenterally; therefore, facilities for managing respiratory depression with mechanical ventilation must be immediately available.

Alcohol withdrawal delirium

Give oral lorazepam or diazepam if the patient can tolerate this.[1] [2] If symptoms persist despite oral medication, or if the patient cannot tolerate oral medication:

- Switch to intravenous lorazepam.

Acute

Involve critical care if alcohol withdrawal delirium continues despite high doses of a benzodiazepine.[158]

Alcohol withdrawal seizures

Use a short-acting benzodiazepine (e.g., lorazepam) to control seizures.[1]

Check blood glucose in all patients with seizures.[56]

Alcohol withdrawal without alcohol withdrawal delirium or active seizures

Give a benzodiazepine first line.[1] [2]

Benzodiazepine dosing regimen

Follow local protocols to determine the dosing regimen. See *Choice of benzodiazepine* below for more information about doses of specific benzodiazepines.

- A benzodiazepine may be given using a **fixed-dose**regimen or a **symptom-triggered** regimen.
    - In the UK, a fixed-dose regimen is generally preferred for any patient being managed on a general inpatient ward. A symptom-triggered regimen may put these patients at risk of being under-treated if the regimen is not followed closely. It requires more regular observation and may only be practical in environments that have the facilities for close monitoring, such as the emergency department or intensive care.
- Use a symptom-triggered regimen if the patient is in hospital and can be monitored closely or in settings where 24-hour assessment and monitoring are available (e.g., the emergency department or intensive care).[1]
    - A symptom-triggered regimen involves tailoring the drug regimen according to the severity of withdrawal and any

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complications.[1] Note that a symptom-triggered regimen may not be appropriate for patients who are confused, delirious, psychotic, or speak poor English as they will not be able to score on anxiety, orientation and clouding of sensorium, or tactile, auditory, and visual disturbances. For these patients, consider using a fixed-dose regimen instead.

- Use a fixed-dose regimen for patients in which a symptom-triggered regimen is not appropriate (e.g., on a general inpatient ward).[32]
    - Start treatment with a standard dose, not defined by the level of alcohol withdrawal; gradually reduce the dose to zero over 7 to 10 days according to a standard protocol.[32]
    - Titrate the initial dose of medication to the severity of alcohol dependence and/or regular day-to-day level of alcohol consumption.[32] Check local guidelines for dose recommendations.

Choice of benzodiazepine

Use a long-acting benzodiazepine in patients who do not have significant hepatic impairment, delirium, or dementia, and who can tolerate oral medication.[1] [172]

- Chlordiazepoxide is commonly used, but diazepam is also an option; check your local guidelines.
    - Diazepam is less commonly used and is slowly being phased out of use as it has a higher potential for abuse than chlordiazepoxide.[173]
- The dose of chlordiazepoxide depends on the severity of alcohol withdrawal symptoms. The patient's response to treatment should always be regularly and closely monitored.

Acute

- It is common practice to prescribe 'as required' (PRN) doses of chlordiazepoxide in addition to the regular dose.
- A dose reduction is recommended in older people and in patients with hepatic impairment.

Use a short-acting benzodiazepine in patients with significant hepatic impairment, delirium, or dementia, or those who cannot tolerate oral medication.

- Lorazepam is most commonly used in practice. However, it may increase the risk of seizures because it has a shorter half-life than chlordiazepoxide [174]

More info: Reduced dose of chlordiazepoxide

In practice, 'as required' (PRN) doses of chlordiazepoxide are commonly prescribed in addition to the regular dose.

- PRN doses are considered safe, even in a patient requiring the higher doses of chlordiazepoxide recommended for severe dependence, as long as the patient still needs treatment based on their CIWA-Ar or GMAWS score.

Use the 'start low and go slow' rule for older patients to minimise adverse effects associated with benzodiazepines (e.g., over-sedation, confusion, and ataxia). It is good practice to start with half the recommended dose and adjust as needed according to response.[175] Use half the recommended dose in patients with mild or moderate hepatic impairment as metabolism is impaired in these patients.

- Reduce the dose of chlordiazepoxide (or switch to a short-acting benzodiazepine such as lorazepam) if the patient becomes drowsy, as this is evidence that the chlordiazepoxide is accumulating.

Acute

Review and monitoring

Review the patient after they have received a **second dose** of any benzodiazepine. If the patient is still highly symptomatic, request a senior review.

- Review the diagnosis of alcohol withdrawal in these patients and consider other causes.

If the patient is receiving a symptom-triggered regimen:

- Monitor the patient closely and regularly[32]
- Continue treatment only for as long as the patient is showing withdrawal symptoms.[1]

If the patient is receiving a fixed-dose regimen:

- Assess the patient every day to ensure that they are not oversedated. Adjust the dose according to response
- In practice, it is common to avoid giving a dose if the patient is asleep. Review the dosing regimen if more than one dose is missed. More than one missed dose should trigger a dose review.

If **alcohol withdrawal delirium** or **seizures** develop while the patient is being treated for acute alcohol withdrawal, review the patient's benzodiazepine regimen (if they are on one).[1]

- Continue the patient's benzodiazepine regimen concurrently with any acute treatment required for alcohol withdrawal delirium or seizures. In patients who are already on an oral benzodiazepine regimen, additional intravenous doses of a benzodiazepine for the treatment of alcohol withdrawal delirium or seizures may be used concurrently.
- In practice, many patients with alcohol withdrawal delirium or seizures may not tolerate oral medication; restart the

Acute

patient's benzodiazepine regimen as soon as they can tolerate this.

Carbamazepine or clomethiazole

Guidelines from the National Institute for Health and Care Excellence (NICE) in the UK recommend carbamazepine (an anticonvulsant) or clomethiazole (a sedative/hypnotic) as alternatives to benzodiazepines, but these are rarely used in practice.[1]

- Indications may include intolerance or allergy to, dependence on, or shortage of benzodiazepines.
- Seek senior advice if you are considering using these drugs.

Clomethiazole should only be used in hospital under close supervision or, in exceptional circumstances, on an outpatient basis by specialist units where the dose must be monitored closely every day.[1]

Use with caution in patients who:[1]

- Are being managed in the community
- Continue to drink or abuse alcohol. Alcohol combined with clomethiazole, particularly in patients with cirrhosis, can lead to fatal respiratory depression even with short-term use.

plus **supportive care + treatment of concurrent acute medical illness**

Treatment recommended for ALL patients in selected patient group

General principles

Manage patients in a quiet room with low lighting and minimal stimulation.

- Use a calm approach and bear in mind that the patient may need frequent verbal reassurance.
- If possible, restrict the patient's caffeine intake; ensure they remain hydrated.[3]

Acute

Correct metabolic abnormalities

Rehydrate the patient. Give intravenous fluids if needed.

- The patient may be dehydrated from vomiting, sweating, or diarrhoea, or secondary to a concurrent acute medical illness.

Correct any electrolyte imbalances (most notably in patients with chronic alcohol-use disorder).

- Consult local protocols to determine doses for electrolyte replacement.[104] [146]

More info: Electrolyte deficiencies

Electrolyte deficiencies are common in people with chronic alcohol-use disorder.[104]

- They can cause life-threatening cardiac arrhythmias; always perform an ECG on patients with electrolyte deficiencies.[105] [106] [107] [108]

In those admitted to hospital with chronic alcohol-use disorder, plasma magnesium, phosphate, and potassium concentrations may be normal or only slightly reduced on admission, only to decrease over several days. This is owing to an inward cellular shift that unmasks decreased total-body stores.[104]

Magnesium

Give intravenous magnesium according to local protocols if serum magnesium is <0.5 mmol/L (<1 mEq/L) or if the patient is symptomatic.[151]

- Monitor the patient's magnesium level:
  - Every day if receiving intravenous replacement

Acute

- Every week if receiving oral replacement.

See our topic *Assessment of magnesium deficiency*.

More info: Magnesium replacement pitfalls

Hypokalaemia and hypocalcaemia will not resolve until adequate magnesium replacement is given.

Be aware that following intravenous replacement, the magnesium level will rise initially but then falls over the next 72 hours, when a repeat magnesium infusion may be required.

Potassium

Give intravenous potassium according to local protocols for severe hypokalaemia (serum potassium <2.5 mEq/L) or in patients who are symptomatic.[152]

See our topic *Assessment of hypokalaemia*.

Calcium

Give intravenous calcium gluconate according to local protocols if there is severe hypocalcaemia (<1.9 mmol/L [<7.5 mg/dL]) or there is tetany, respiratory failure, arrhythmia, or seizures.[108]

- Cardiac arrhythmias can occur if calcium gluconate is given too quickly; monitor using ECG.

See our topic *Assessment of hypocalcaemia*.

Phosphate

Give intravenous phosphate according to local protocols if the patient is critically unwell or unable to tolerate oral intake, or if serum phosphate is <1.5 mg/dL.[153]

Acute

- Do not give intravenous phosphate if there is pre-existing hypocalcaemia as this can worsen the hypocalcaemia.

More info: Risks of phosphate replacement

Other risks of intravenous phosphate replacement are seizures, ECG changes, and shock, and overtreatment resulting in hyperphosphataemia and hyperkalaemia. Therefore monitor calcium, potassium, phosphate, magnesium, and creatinine levels (e.g., every 6 hours) as well as cardiac function using ECG.[153]

Glucose

Correct hypoglycaemia by giving:

- Oral glucose, either in liquid form or as granulated sugar or sugar lumps, if the patient is conscious and able to tolerate oral intake[154]
- Intravenous glucose if the patient is unconscious or unable to take oral glucose[154]
- Glucagon by intramuscular or subcutaneous injection if there is no intravenous access.[155]

If you give glucose, give it at the same time or after thiamine. However, do not delay glucose for life-threatening hypoglycaemia while waiting for thiamine administration.

- Some evidence suggests that prolonged glucose supplementation without the addition of thiamine can be a risk factor for the development of Wernicke's encephalopathy.[100] [101] [102]

Treat concurrent acute medical illness

Assess for features of acute medical illness and chronic or decompensated liver disease due to alcohol-use disorder. Be aware that all these patients need admission.

Acute

- Commonly associated acute illnesses include:
  - Pneumonia
  - Pancreatitis
  - Hepatitis
  - Gastritis.
- Features of chronic or decompensated liver disease tend to be late signs of liver disease and therefore may not be present in all patients. These patients should be managed by a specialist. These features include:
  - Hepatomegaly
  - Jaundice
  - Ascites[92]
  - Caput medusa[92]
  - Palmar erythema[92]
  - Hepatic encephalopathy.

See our topics *Alcoholic liver disease*, *Community-acquired pneumonia*, *Acute pancreatitis*, and *Gastritis* for more information.

More info: Management of gastritis

Gastritis secondary to heavy alcohol use is common in patients with alcohol withdrawal. It is important to recognise and treat this. Alleviating the unpleasant symptoms will help keep the patient calm and settled, therefore reducing the risk of them absconding.

- Use a proton-pump inhibitor (e.g., omeprazole) for treatment in the acute setting. If there is persistent hypomagnesaemia or hypokalaemia consider switching to an H2 receptor antagonist (e.g., ranitidine).[93] [94]

plus **thiamine**

Treatment recommended for ALL patients in selected patient group

Primary options

Acute

» thiamine: consult local protocol for dose guidelines

» Give thiamine (vitamin B1) to any patient with alcohol withdrawal to prevent or treat **Wernicke's encephalopathy**.[1] [2] Thiamine can be given orally or parenterally. See our topic Wernicke's encephalopathy .

- Give this treatment in doses towards the upper end of the British National Formulary range. In an emergency department setting or where a harmful or dependent drinker is admitted with alcohol withdrawal or an acute illness, this would usually be parenteral thiamine, with oral thiamine treatment following on from this.[1] [2] [45] Ensure that you check local guidance and formularies as these may advise specific preparations and doses.
- For any patient being admitted to hospital, after an initial parenteral dose:
  - Give further doses according to local protocols. It is important to note that the doses and route of administration for prevention and treatment differ.[1]
  - Oral thiamine treatment should follow a course of parenteral therapy for the remainder of the patient's hospital stay and throughout outpatient treatment.[1]

Practical tip

Ensure there are facilities available for treating anaphylaxis if giving parenteral thiamine.

- Potentially serious allergic adverse reactions may rarely occur during, or shortly after parenteral administration. However, this should not stop the use of parenteral thiamine in any patient who needs thiamine via this route of administration, particularly in patients at risk of Wernicke's encephalopathy.

consider **airway management**

Treatment recommended for SOME patients in selected patient group

Acute

» Ensure a patent airway immediately.

» Involve senior support and critical care early in any patient with a compromised airway.

with psychotic symptoms (including refractory alcohol withdrawal delirium)

plus **antipsychotic**

Treatment recommended for ALL patients in selected patient group

Primary options

» haloperidol: consult local protocol for dose guidelines

OR

» olanzapine: consult local protocol for dose guidelines

» Add an antipsychotic if the patient still has psychotic symptoms after receiving approximately **≥130 mg chlordiazepoxide** in the **first hour** of treatment.

» Haloperidol and olanzapine are commonly used.

Practical tip

Symptoms of alcohol withdrawal delirium are very difficult to control. Ensure early drug treatment. Involve senior support and consider referring to critical care.
If alcohol withdrawal delirium develops while the patient is being treated for acute alcohol withdrawal, review the patient's benzodiazepine regimen.[1]

consider **phenobarbital**

Treatment recommended for SOME patients in selected patient group

Primary options

» phenobarbital: consult local protocol for dose guidelines

» Consider phenobarbital if psychotic symptoms continue despite use of a benzodiazepine and an antipsychotic.[1]

consider **rapid tranquilisation**

Treatment recommended for SOME patients in selected patient group

Primary options

MANAGEMENT

Acute

» midazolam: consult local protocol for dose guidelines

OR

» ketamine: consult local protocol for dose guidelines

OR

» propofol: consult local protocol for dose guidelines

» Consider rapid tranquilisation if psychotic symptoms continue despite high doses of a benzodiazepine and addition of an antipsychotic or phenobarbital. Involve critical care.

- Use midazolam or ketamine or propofol. Decide which drug to use based on your choice/training and according to local protocols.
- **Ensure that intensive care/ anaesthetics or staff trained in sedation and airway management are present.**

suspected alcohol withdrawal and CIWA-Ar score <10 or GMAWS score <2

1st **supportive care + treatment of concurrent acute medical illness**

General principles

Manage patients in a quiet room with low lighting and minimal stimulation.

- Use a calm approach and bear in mind that the patient may need frequent verbal reassurance.
- If possible, restrict the patient's caffeine intake; ensure they remain hydrated.[3]

Correct metabolic abnormalities

Rehydrate the patient. Give intravenous fluids if needed.

Acute

- The patient may be dehydrated from vomiting, sweating, or diarrhoea, or secondary to a concurrent acute medical illness.

Correct any electrolyte imbalances (most notably in patients with chronic alcohol-use disorder).

- Consult local protocols to determine doses for electrolyte replacement.[104] [146]

More info: Electrolyte deficiencies

Electrolyte deficiencies are common in people with chronic alcohol-use disorder.[104]

- They can cause life-threatening cardiac arrhythmias; always perform an ECG on patients with electrolyte deficiencies [105] [106] [107] [108]

In those admitted to hospital with chronic alcohol-use disorder, plasma magnesium, phosphate, and potassium concentrations may be normal or only slightly reduced on admission, only to decrease over several days. This is owing to an inward cellular shift that unmasks decreased total-body stores.[104]

Magnesium

Give intravenous magnesium according to local protocols if serum magnesium is <0.5 mmol/L (<1 mEq/L) or if the patient is symptomatic.[151]

- Monitor the patient's magnesium level:
  - Every day if receiving intravenous replacement
  - Every week if receiving oral replacement.

See our topic *Assessment of magnesium deficiency*.

Acute

More info: Magnesium replacement pitfalls

Hypokalaemia and hypocalcaemia will not resolve until adequate magnesium replacement is given.

Be aware that following intravenous replacement, the magnesium level will rise initially but then falls over the next 72 hours, when a repeat magnesium infusion may be required.

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More info: Risks of phosphate replacement

Do not give intravenous phosphate if there is pre-existing hypocalcaemia as this can worsen the hypocalcaemia.

Other risks of intravenous replacement are seizures, ECG changes, and shock, and overtreatment resulting in

Acute

hyperphosphataemia and hyperkalaemia. Therefore, monitor calcium, potassium, phosphate, magnesium, and creatinine levels (e.g., every 6 hours) as well as cardiac function using ECG.[153]

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Correct hypoglycaemia by giving:

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If you give glucose, give it at the same time or after thiamine. However, do not delay glucose for life-threatening hypoglycaemia while waiting for thiamine administration.

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Treat concurrent acute medical illness

Assess for features of acute medical illness and chronic or decompensated liver disease due to alcohol-use disorder. Be aware that all these patients need admission.

- Commonly associated acute illnesses include:
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  - Pancreatitis
  - Hepatitis
  - Gastritis.

Acute

- Features of chronic or decompensated liver disease tend to be late signs of liver disease and therefore may not be present in all patients. These patients should be managed by a specialist. These features include:
  - Hepatomegaly
  - Jaundice
  - Ascites[92]
  - Caput medusa[92]
  - Palmar erythema[92]

See our topics *Alcoholic liver disease*, *Community-acquired pneumonia*, *Acute pancreatitis*, and *Gastritis* for more information.

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Gastritis secondary to heavy alcohol use is common in patients with alcohol withdrawal. It is important to recognise and treat this. Alleviating the unpleasant symptoms will help keep the patient calm and settled, therefore reducing the risk of them absconding.

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plus **thiamine**

Treatment recommended for ALL patients in selected patient group

Primary options

» thiamine: consult local protocol for dose guidelines

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- Give this treatment in doses towards the upper end of the British National Formulary range. In an emergency department setting or where a harmful

Acute

or dependent drinker is admitted with alcohol withdrawal or an acute illness, this would usually be parenteral thiamine, with oral thiamine treatment following on from this.[1] [2] [45] Ensure that you check local guidance and formularies as these may advise specific preparations and doses.

- For any patient being admitted to hospital, after an initial parenteral dose:
  - Give further doses according to local protocols. It is important to note that the doses and route of administration for prevention and treatment differ.[1]

Practical tip

Ensure there are facilities available for treating anaphylaxis if giving parenteral thiamine.

- Potentially serious allergic adverse reactions may rarely occur during, or shortly after parenteral administration. However, this should not stop the use of parenteral thiamine in any patient who needs thiamine via this route of administration, particularly in patients at risk of Wernicke's encephalopathy.

consider **benzodiazepine or carbamazepine or clomethiazole**

Treatment recommended for SOME patients in selected patient group

Primary options

» lorazepam: seizures: 4 mg intravenously as a single dose initially, repeat dose after 10 minutes if required; acute alcohol withdrawal or alcohol withdrawal delirium: consult local protocol for dose guidelines
A dose reduction is recommended in older people and patients with hepatic impairment.

OR

» diazepam: consult local protocol for dose guidelines

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A dose reduction is recommended in older people and patients with hepatic impairment; avoid in severe hepatic impairment.

OR

» chlordiazepoxide: consult local protocol for dose guidelines
A dose reduction is recommended in older people and patients with hepatic impairment; avoid in severe hepatic impairment.

Secondary options

» carbamazepine: consult local protocol for dose guidelines

Tertiary options

» clomethiazole: consult local protocol for dose guidelines

» Not all patients with symptoms of alcohol withdrawal will need acute pharmacological treatment.

- Patients with mild to moderate alcohol withdrawal symptoms (CIWA-Ar < 10 or GMAWS <2) can generally be managed with supportive care only.[3]

» Even if the patient scores <10 on CIWA-Ar or <2 on GMAWS, consider observing them for 4 to 6 hours prior to discharge to monitor for worsening symptoms.

» Give a **benzodiazepine first line** if pharmacological treatment is required.[1] [2]

» Do not give a benzodiazepine to patients being managed in the community unless there are **adequate specialist facilities** to monitor and support them.

Benzodiazepine dosing regimen

Follow local protocols to determine the dosing regimen. See *Choice of benzodiazepine* below for more information about doses of specific benzodiazepines.

- A benzodiazepine may be given using a **fixed-dose** regimen or a **symptom-triggered** regimen.

Acute

- In the UK, a fixed-dose regimen is generally preferred for any patient being managed on a general inpatient ward. A symptom-triggered regimen may put these patients at risk of being under-treated if the regimen is not followed closely. It requires more regular observation and may only be practical in environments that have the facilities for close monitoring, such as the emergency department or intensive care.

- Use a symptom-triggered regimen if the patient is in hospital and can be monitored closely or in settings where 24-hour assessment and monitoring are available (e.g., the emergency department or intensive care).[32]
    - A symptom-triggered regimen involves tailoring the drug regimen according to the severity of withdrawal and any complications.[1] Note that a symptom-triggered regimen may not be appropriate for patients who are confused, delirious, psychotic, or speak poor English as they will not be able to score on anxiety, orientation and clouding of sensorium, or tactile, auditory, and visual disturbances. For these patients, consider using a fixed-dose regimen instead.

- Use a fixed-dose regimen if the patient is being managed in the community or if the patient is being managed in hospital and a symptom-triggered regimen is not appropriate (e.g., on a general inpatient ward).[32]
    - Start treatment with a standard dose, not defined by the level of alcohol withdrawal; gradually reduce the dose to zero over 7 to 10 days according to a standard protocol.[32]
    - Titrate the initial dose of medication to the severity

Acute

of alcohol dependence and/or regular day-to-day level of alcohol consumption.[32] Check local guidelines for dose recommendations.

Choice of benzodiazepine

Use a long-acting benzodiazepine in patients who do not have significant hepatic impairment, delirium, or dementia, and who can tolerate oral medication.[1] [172]

- Chlordiazepoxide is commonly used, but diazepam is also an option; check your local guidelines.
    - Diazepam is less commonly used and is slowly being phased out of use as it has a higher potential for abuse than chlordiazepoxide.[173]
- The dose of chlordiazepoxide depends on the severity of alcohol withdrawal symptoms. The patient's response to treatment should always be regularly and closely monitored.
- It is common practice to prescribe 'as required' (PRN) doses of chlordiazepoxide in addition to the regular dose.
- A dose reduction is recommended in older people and in patients with hepatic impairment.

Use a short-acting benzodiazepine in patients with significant hepatic impairment, delirium, or dementia, or those who cannot tolerate oral medication.

- Lorazepam is most commonly used in practice. However, it may increase the risk of seizures because it has a shorter half-life than chlordiazepoxide. [174]

More info: Reduced dose of chlordiazepoxide

Acute

In practice, 'as required' (PRN) doses of chlordiazepoxide are commonly prescribed in addition to the regular dose.

- PRN doses are considered safe, even in a patient requiring the higher doses of chlordiazepoxide recommended for severe dependence, as long as the patient still needs treatment based on their CIWA-Ar or GMAWS score.

Use the 'start low and go slow' rule for older patients to minimise adverse effects associated with benzodiazepines (e.g., over-sedation, confusion, and ataxia). It is good practice to start with half the recommended dose and adjust as needed according to response.[175] Use half the recommended dose in patients with mild or moderate hepatic impairment as metabolism is impaired in these patients.

- Reduce the dose of chlordiazepoxide (or switch to a short-acting benzodiazepine such as lorazepam) if the patient becomes drowsy, as this is evidence that the chlordiazepoxide is accumulating.

Review and monitoring

Review the patient after they have received a **second dose** of any benzodiazepine. If the patient is still highly symptomatic, request a senior review.

- Review the diagnosis of alcohol withdrawal in these patients and consider other causes.

If the patient is receiving a symptom-triggered regimen:

- Monitor the patient closely and regularly[1]
- Continue treatment only for as long as the patient is showing withdrawal symptoms.[32]

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If the patient is receiving a fixed-dose regimen:

- Assess the patient every day to ensure that they are not oversedated. Adjust the dose according to response
- In practice, it is common to avoid giving a dose if the patient is asleep. Review the dosing regimen if more than one dose is missed. More than one missed dose should trigger a dose review.

If **alcohol withdrawal delirium** or **seizures** develop while the patient is being treated for acute alcohol withdrawal, review the patient's benzodiazepine regimen (if they are on one).[1]

- Continue the patient's benzodiazepine regimen concurrently with any acute treatment required for alcohol withdrawal delirium or seizures. In patients who are already on an oral benzodiazepine regimen, additional intravenous doses of a benzodiazepine for the treatment of alcohol withdrawal delirium or seizures may be used concurrently.
- In practice, many patients with alcohol withdrawal delirium or seizures may not tolerate oral medication; restart the patient's benzodiazepine regimen as soon as they can tolerate this.

In the community

Do not give a benzodiazepine to patients being managed in the community unless there are adequate specialist facilities to monitor and support them. However, if a benzodiazepine is suitable:

- Monitor the patient every other day and involve a family member or carer to oversee the administration of medication[32]
- Adjust the dose if severe withdrawal symptoms or over-sedation occur.[32]

Avoid giving the patient large quantities of medication to take home to prevent overdose

Acute

or diversion. Do not supply more than 2 days' medication at any time.[32]

Carbamazepine or clomethiazole

Guidelines from the National Institute for Health and Care Excellence (NICE) in the UK recommend carbamazepine (an anticonvulsant) or clomethiazole (a sedative/hypnotic) as alternatives to benzodiazepines, but these are rarely used in practice.[1]

- Indications may include intolerance or allergy to, dependence on, or shortage of benzodiazepines.
- Seek senior advice if you are considering using these drugs.

Clomethiazole should only be used in hospital under close supervision or, in exceptional circumstances, on an outpatient basis by specialist units where the dose must be monitored closely every day.[1] Use with caution in patients who:

- Are being managed in the community
- Continue to drink or abuse alcohol. Alcohol combined with clomethiazole, particularly in patients with cirrhosis, can lead to fatal respiratory depression even with short-term use.

consider **outpatient management**

Treatment recommended for SOME patients in selected patient group

» Take a comprehensive history and use this, alongside examination findings, to guide whether to admit the patient to hospital. Consider admission to hospital in:[1] [32]

- Young people (under 16 years)
- Those at high risk of developing alcohol withdrawal seizures or alcohol withdrawal delirium. These patients typically have at least one of:
  - A score >30 on SAD-Q
  - Alcohol intake >30 units of alcohol per day

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- Signs and symptoms of autonomic overactivity (e.g., tremor, tachycardia, sweating, or palpitations)
- Signs of intoxication.

» If considering discharge (without admission), **advise the patient to continue drinking alcohol**. Stopping abruptly may lead to severe withdrawal.

- If possible, the patient should gradually reduce their intake over several weeks/ months.
- It is common practice to advise them to decrease their level of drinking by not more than 25% every 2 weeks.

» Have a lower threshold when considering admission to hospital of vulnerable people who are in acute alcohol withdrawal. These include people who:[1] [32]

- Are frail
- Have cognitive impairment or multiple comorbidities, including poorly controlled chronic medical conditions and serious psychiatric conditions such as suicidal ideation and psychosis
- Lack social support
- Have learning difficulties
- Are aged 16 or 17 years.

More info: Pitfalls of outpatient management

Pay attention to why the patient has stopped drinking. They may have run out of money or feel too unwell (owing to concomitant illness) to drink alcohol, and are therefore at risk of developing worsening symptoms if not admitted for medically assisted withdrawal.

Never advise a patient who is being discharged to suddenly stop or reduce their drinking as this could precipitate severe symptoms. Signpost to outpatient services where controlled withdrawal can be

Acute

organised.[1] Check local protocols for what is recommended and available in your area.

- Many patients who are alcohol-dependent manage their withdrawal symptoms every day with continued alcohol consumption. It is often appropriate to continue this until the patient can be assessed formally by addiction services who will help determine the best treatment for the individual patient.[2]

Unnecessary inpatient detoxification is not only detrimental to the patient's health but also unlikely to result in continued abstinence and long-term change.[134] [135]

Emerging

Baclofen

Baclofen is being studied for use in alcohol withdrawal, but there is insufficient evidence to currently support its use in the clinical setting.[188]

Primary prevention

Identify patients at risk of alcohol withdrawal early.

- Screen patients for alcohol-use disorder using a formal assessment tool such as AUDIT-C ([Alcohol Use Disorders Identification Test - Consumption]), FAST ([Fast Alcohol Screening Test]), or PAT ([Paddington Alcohol Test 2011]).[2]The full AUDIT ([Alcohol Use Disorders Identification Test]) may also be used, but it takes longer to perform than the other screening tools and therefore may not be suitable in an acute hospital setting.[2] Abbreviated versions of AUDIT, such as AUDIT-C and FAST, were developed for use in acute settings where the full AUDIT would take too long to perform. These compare favourably with the full screening tool.
- Identify patients who have tested positive for alcohol misuse and are at risk of alcohol withdrawal by assessing their level of alcohol dependence. AUDIT-C, FAST, PAT, and AUDIT only identify alcohol-use disorder and do not predict which patients are at risk of alcohol withdrawal. Decide which screening tool to use based on local protocols and your preference.
    - Use either SAD-Q or the CAGE questionnaire.[3] [5] [32]
    - In addition, ask about any history of alcohol withdrawal syndrome (and the degree of severity, such as seizures, alcohol withdrawal delirium [also known as delirium tremens], etc.).

Monitor patients at risk of alcohol withdrawal using CIWA-Ar ([Clinical Institute Withdrawal Assessment of Alcohol, revised]) or GMAWS ([Glasgow Modified Alcohol Withdrawal Scale]).

- Give supportive care and thiamine replacement to all patients.
- Give drug treatment to all patients with alcohol withdrawal and CIWA-Ar score ≥10 or GMAWS ≥2.[3] [33]
- Patients with mild to moderate alcohol withdrawal symptoms (CIWA-Ar score < 10 or GMAWS <2) can generally be managed with supportive care only.[3]

Consider admission to hospital in:[1] [32]

- Young people (under 16 years)
- Those at high risk of developing alcohol withdrawal seizures or alcohol withdrawal delirium. These patients typically have at least one of:
    - A score >30 on SAD-Q
    - Alcohol intake >30 units of alcohol per day
    - Signs and symptoms of autonomic overactivity (e.g., tremor, tachycardia sweating, or palpitations)
    - Signs of intoxication.

Secondary prevention

Identify any patient with features of alcohol withdrawal early and start treatment (if needed) promptly to prevent severe alcohol withdrawal, including alcohol withdrawal delirium. Give supportive care and thiamine replacement to decrease the risk of alcohol-related complications.[193]

Patient discussions

If considering discharge (without admission), advise the patient to continue drinking alcohol. Stopping abruptly may lead to severe withdrawal. If possible, the patient should gradually reduce their intake over several weeks/months. It is common practice to advise them to decrease their level of drinking by not more than 25% every 2 weeks.

- Pay attention to why the patient has stopped drinking. They may have run out of money or feel too unwell (owing to concomitant illness) to drink alcohol and are therefore at higher risk of developing worsening symptoms if they aren't admitted for medically assisted withdrawal.
- Never advise a patient who is being discharged to suddenly stop or reduce their drinking as this could precipitate severe symptoms. Signpost to outpatient services where controlled withdrawal can be organised.[1] Check local protocols for what is available and recommended in your area.
- Many patients who are alcohol-dependent manage their withdrawal symptoms every day with continued alcohol consumption. It is often appropriate to continue this until the patient can be assessed formally by addiction services to determine the best treatment for their alcohol dependence.[2]
- Give general advice regarding a healthy lifestyle, including intake of a balanced diet with the recommended daily allowance of vitamins, especially thiamine.
- Give the patient advice on guideline-led recommended limits of alcohol. In the UK, the Chief Medical Officers' guideline states that it is safest not to drink more than 14 units a week on a regular basis.[192]

Monitoring

Monitoring

Inpatients#

Monitor all patients who have been admitted every hour until they are stable; in particular:

- Use the CIWA-Ar score to monitor response to drug treatment[2] [45][1]
- Check blood glucose
- Observe vital signs using a validated scoring system recommended by your local protocols, such as the National Early Warning Score 2 (NEWS2).[150]

Outpatients#

Refer any patient who is dependent on alcohol and wants to stop drinking to specialist alcohol services so they can be assessed for community-based alcohol withdrawal.[32]

- Do not advise the patient to suddenly stop or reduce their alcohol intake while waiting for outpatient services as this could precipitate severe withdrawal symptoms.[1]
- If possible, the patient should gradually reduce their intake over several weeks/months. It is common practice to advise the patient to decrease their level of drinking by not more than 25% every 2 weeks.

Do not prescribe medication to patients being managed in the community unless they have adequate assessment and support as successful withdrawal is unlikely and there are considerable associated clinical risks.[10]

A community-based alcohol withdrawal programme will vary in intensity according to the severity of the patient's alcohol dependence, available social support and the presence of comorbidities.[32]

- This may include regular meetings with programme staff, psychological support, access to self-help groups and family and carer support and involvement.[32]
- Avoid giving people in the community large quantities of medication to take home to prevent overdose or diversion. Prescribe for installment dispensing, with no more than 2 days' medication supplied at any time.[32]
- Monitor the patient every other day during assisted withdrawal. A family member or carer should preferably oversee the administration of medication. Adjust the dose if severe withdrawal symptoms or over-sedation occur.[32]
- Do not offer clomethiazole for community-based assisted withdrawal because of the risk of overdose and misuse.[32]

FOLLOW UP

Complications

Complications	Timeframe	Likelihood
over-sedation	**short term**	**medium**
Can be a complication of treatment.		
status epilepticus	**short term**	**low**
Alcohol withdrawal is one of the most common causes of status epilepticus. However, less than 3% of alcohol withdrawal seizures progress to status epilepticus.[191]		

Prognosis

Alcohol withdrawal delirium is fatal in 15% to 20% of patients if untreated.[34] [35]

- Appropriate early management reduces mortality to around 1%.[9]

The patient may describe persistent insomnia and autonomic symptoms for a few months after the acute withdrawal phase. These symptoms usually **last about 6 months**.

About 50% of patients remain abstinent from alcohol for a year. Relapses can be prevented with counselling, self-help groups (e.g., Alcoholics Anonymous [Alcoholics Anonymous]), and pharmacotherapy.[189] [190]

Diagnostic guidelines

United Kingdom

Alcohol-use disorders: diagnosis and management of physical complications

Published by: National Institute for Health and Care Excellence **Last published:** 2017

The UK NSC recommendation on alcohol misuse screening in adults

Published by: National Screening Committee **Last published:** 2017

Assessment and management of alcohol dependence and withdrawal in the acute hospital

Published by: Royal College of Physicians **Last published:** 2012

Europe

EFNS guidelines for alcohol-related seizures

Published by: European Academy of Neurology (European Federation of Neurological Societies) **Last published:** 2011

Treatment guidelines

United Kingdom

Detainees with substance use disorders in police custody: guidelines for clinical management

Published by: Royal College of Psychiatrists **Last published:** 2020

Alcohol-use disorders: diagnosis and management of physical complications

Published by: National Institute for Health and Care Excellence **Last published:** 2017

Assessment and management of alcohol dependence and withdrawal in the acute hospital

Published by: Royal College of Physicians **Last published:** 2012

Evidence-based guidelines for the pharmacological management of substance abuse, harmful use, addiction and comorbidity

Published by: British Association of Psychopharmacology **Last published:** 2012

Europe

EFNS guidelines for alcohol-related seizures

Published by: European Academy of Neurology (European Federation of Neurological Societies) **Last published:** 2011

International

Management of alcohol withdrawal

Published by: World Health Organization **Last published:** 2012

North America

The ASAM clinical practice guideline on alcohol withdrawal management

Published by: American Society of Addiction Medicine **Last published:** 2020

Online resources

1. Alcohol Use Disorders Identification Test - Consumption *(external link)*
2. Fast Alcohol Screening Test *(external link)*
3. Paddington Alcohol Test 2011 *(external link)*
4. Alcohol Use Disorders Identification Test *(external link)*
5. Clinical Institute Withdrawal Assessment of Alcohol, revised *(external link)*
6. Glasgow Modified Alcohol Withdrawal Scale *(external link)*
7. Severity of Alcohol Dependence Questionnaire *(external link)*
8. SCIE: Deprivation of Liberty Safeguards (DoLS) at a glance *(external link)*
9. Alcohol Change UK: Unit calculator *(external link)*
10. Carers Trust: Caring for someone with alcohol or substance misuse issues *(external link)*
11. RCP: National Early Warning Score 2 *(external link)*
12. Alcoholics Anonymous *(external link)*

EVIDENCE TABLES

Evidence tables

How do different pharmacological interventions compare for the treatment of alcohol withdrawal syndrome?

This table is a summary of the analysis reported in a Cochrane Clinical Answer that focuses on the above important clinical question.

Cochrane Clinical Answers

View the full source Cochrane Clinical Answer

Evidence B *

Confidence in the evidence is moderate or low to moderate where GRADE has been performed and there may be no difference in effectiveness between the intervention and comparison for key outcomes.

Population: People with alcohol withdrawal
Intervention: Benzodiazepines, anticonvulsants, or antipsychotics #
Comparison: Each other

Outcome	Effectiveness (BMJ rating)†	Confidence in evidence (GRADE)‡
Benzodiazepines versus anticonvulsants		
Alcohol withdrawal seizures (mean follow-up 10 days)	No statistically significant difference	Moderate
Overall adverse events (mean follow-up 10 days)	No statistically significant difference	Low
Withdrawals due to adverse events	No statistically significant difference	Moderate
Alcohol withdrawal delirium, alcohol withdrawal symptoms, serious adverse events	-	None of the studies identified by the review assessed these outcomes
Benzodiazepines versus antipsychotics		
Alcohol withdrawal seizures (mean follow-up 10 days)	Favours benzodiazepines	High
Overall adverse events (mean follow-up 10 days)	No statistically significant difference	Moderate
Withdrawals due to adverse events	No statistically significant difference	High

Outcome	Effectiveness (BMJ rating)†	Confidence in evidence (GRADE)‡
Alcohol withdrawal delirium, alcohol withdrawal symptoms, serious adverse events	-	None of the studies identified by the review assessed these outcomes
Anticonvulsants versus antipsychotics		
Alcohol withdrawal seizures (mean follow-up 10 days)	No statistically significant difference	Moderate
Overall adverse events (mean follow-up 10 days)	No statistically significant difference	Low
Withdrawals due to adverse events	No statistically significant difference	Moderate
Alcohol withdrawal delirium, alcohol withdrawal symptoms, serious adverse events	-	None of the studies identified by the review assessed these outcomes

Note

The Cochrane systematic review underlying this Cochrane Clinical Answer (CCA) notes that of the four treatments considered, benzodiazepines were the only one that showed a statistically significant benefit against alcohol withdrawal symptoms, especially seizures, when compared with placebo. However, they also state that due to heterogeneity and a lack of evidence on potential harms, “no definite conclusions about the effectiveness and safety of benzodiazepines were possible” and that further research is required.

The CCA which underpins this evidence table also includes data for gamma-hydroxybutyric acid. This intervention is not included here since it is not a recommended treatment in this BMJ Best Practice topic. Please see the full CCA for more information.

EVIDENCE TABLES

What are the effects of benzodiazepines compared with placebo in people with alcohol withdrawal?

This table is a summary of the analysis reported in a Cochrane Clinical Answer that focuses on the above important clinical question.

Cochrane Clinical Answers

View the full source Cochrane Clinical Answer

Evidence B *

Confidence in the evidence is moderate or low to moderate where GRADE has been performed and the intervention may be more effective/beneficial than the comparison for key outcomes.

Population: Patients with alcohol withdrawal (mostly male adults, age range 18-63 years old where reported)

Intervention: Benzodiazepines #

Comparison: Placebo #

Outcome	Effectiveness (BMJ rating)†	Confidence in evidence (GRADE)‡
Alcohol withdrawal seizures (trial duration unclear)	Favours intervention	Moderate
Adverse events (trial duration unclear)	No statistically significant difference	Low
Dropout due to adverse events (trial duration unclear)	No statistically significant difference	GRADE assessment not performed for this outcome
Alcohol withdrawal delirium, withdrawal symptoms at end of treatment, number of patients with global improvement, craving	-	None of the studies identified by the review assessed these outcomes

Note

The Cochrane review which underpins this Cochrane Clinical Answer (CCA) notes that data on the potential harms of benzodiazepines in patients with alcohol withdrawal is sparse and fragmented.

This evidence table summarises the findings for the comparison of benzodiazepines (most studies used diazepam or chlordiazepoxide; one study used lorazepam) versus placebo, which is the main comparison as stated in the Cochrane review Summary of Findings table. See the full CCA for information on other comparisons (benzodiazepine versus other drugs; benzodiazepine versus an alternative benzodiazepine).

* Evidence levels

The Evidence level is an internal rating applied by BMJ Best Practice. See the EBM Toolkit for details.

Confidence in evidence

A - High or moderate to high

B - Moderate or low to moderate

C - Very low or low

† Effectiveness (BMJ rating)

Based on statistical significance, which demonstrates that the results are unlikely to be due to chance, but which does not necessarily translate to a clinical significance.

‡ Grade certainty ratings

High	The authors are very confident that the true effect is similar to the estimated effect.
Moderate	The authors are moderately confident that the true effect is likely to be close to the estimated effect.
Low	The authors have limited confidence in the effect estimate and the true effect may be substantially different.
Very Low	The authors have very little confidence in the effect estimate and the true effect is likely to be substantially different.

BMJ Best Practice EBM Toolkit: What is GRADE?

Key articles

- National Institute for Health and Care Excellence. Alcohol-use disorders: diagnosis and clinical management of alcohol-related physical complications. April 2017 [internet publication]. Full text
- Royal College of Physicians. Alcohol dependence and withdrawal in the acute hospital. June 2012 [internet publication]. Full text
- Bråthen G, Ben-Menachem E, Brodtkorb E, et al. Chapter 29: alcohol-related seizures. In: Gilhus NE, Barnes MP, Brainin M, eds. European handbook of neurological management. 2nd ed, vol 1. Oxford, UK: Blackwell publishing; 2011:429-36. Full text
- Tiglao SM, Meisenheimer ES, Oh RC. Alcohol withdrawal syndrome: Outpatient management. Am Fam Physician. 2021 Sep 1;104(3):253-62. Abstract

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