

Chapter 5. Alcohol withdrawal management

5. Alcohol withdrawal management

This chapter provides guidance on the role of withdrawal services in treating alcohol problems, managing patients in alcohol withdrawal, and assessing and managing heavy drinkers with severe withdrawal complications, including seizures, delirium and hallucinations.

Alcohol withdrawal syndrome: Clinical presentation

Signs and symptoms of alcohol withdrawal

The signs and symptoms of alcohol withdrawal may be grouped into three major classes – autonomic hyperactivity, gastrointestinal, and cognitive and perceptual changes – and may feature uncomplicated or complicated withdrawal (see Table 5.1).

Table 5.1: Signs and symptoms of alcohol withdrawal

	Autonomic hyperactivity	Gastrointestinal features	Cognitive and perceptual changes
Uncomplicated withdrawal features	Sweating Tachycardia Hypertension Tremor Fever (generally lower than 38°C)	Anorexia Nausea Vomiting Dyspepsia Diarrhoea	Poor concentration Anxiety Psychomotor agitation Disturbed sleep, vivid dreams
Severe withdrawal complications	Dehydration and electrolyte disturbances	–	Seizures Hallucinations or perceptual disturbances (visual, tactile, auditory) Delirium

Onset and duration of withdrawal symptoms

Onset of alcohol withdrawal is usually between six and 24 hours after the last drink. In some severely dependent drinkers, withdrawal can occur when the blood alcohol level is decreasing, even if the patient is still intoxicated or has consumed alcohol recently; a significant proportion of dependent drinkers experience the onset of withdrawal symptoms before the blood alcohol level reaches zero. Patient care should not be decided on based upon blood alcohol level alone. Alcohol withdrawal rating scales can be used to assess the patient's level of alcohol withdrawal symptoms.

While for most people the alcohol withdrawal syndrome is short-lived and inconsequential, in others it increases in severity through the first 48 to 72 hours of abstinence. The patient becomes highly vulnerable to psychological and physiological stress during this time. Psychological symptoms of alcohol withdrawal, including dysphoria, sleep disturbance and anxiety, often persist for several weeks after drinking cessation.

Other substance use, medical and psychiatric conditions can affect the onset, severity and duration of alcohol withdrawal. Use of benzodiazepines or other sedatives often delays the onset of withdrawal and diminishes its severity. It also provides guidance on prevention and treatment of Wernicke's encephalopathy in these patients.

Severe withdrawal complications

Severe withdrawal complications include seizures, delirium and hallucinations.

Alcohol withdrawal seizures

Alcohol withdrawal seizures are usually generalised (tonic-clonic) seizures. They occur as blood alcohol levels fall, typically within 6 to 48 hours after the last drink is consumed, and can occur even if the blood alcohol level is high (for example, greater than 0.10 g%) in severely dependent drinkers.

The prevalence of alcohol-withdrawal seizures is estimated at between 2 and 9 per cent of alcohol dependent people. People who have experienced an alcohol withdrawal seizure are more likely to experience further seizures in subsequent alcohol withdrawal episodes. The risk of seizure recurrence within 6 to 12 hours is estimated at between 13 and 24 per cent in untreated patients.

Alcohol withdrawal delirium

The features of alcohol withdrawal delirium (also known as delirium tremens or DTs) are disturbance of consciousness and changes in cognition or perceptual disturbance. The terms 'alcohol withdrawal delirium' and 'delirium tremens' can be used interchangeably. Alcohol withdrawal delirium is an acute organic brain syndrome characterised by confusion and disorientation, agitation, hyperactivity and tremor.

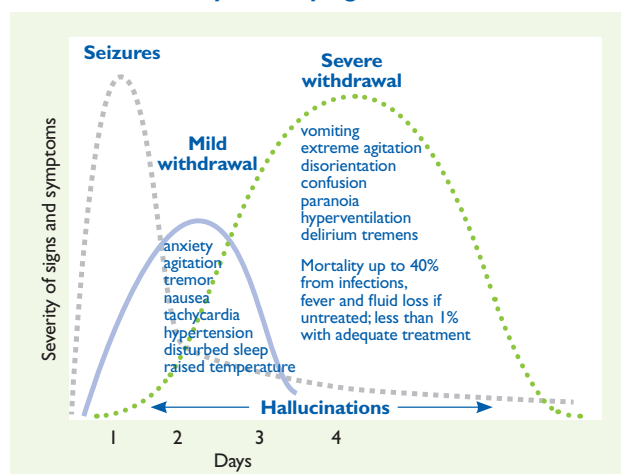
Alcohol withdrawal delirium typically commences 2 to 3 days after ceasing drinking, and usually lasts for a further 2 to 3 days, although it can persist for weeks.

The incidence of alcohol withdrawal delirium in unmedicated alcohol dependent patients averages 5 per cent, although the incidence is much lower with effective treatment of alcohol withdrawal. Early studies of delirium tremens reported mortality rates as high as 15 per cent; however, mortality rates have fallen with advances in management to less than 1 per cent.

Hallucinations

Some patients experience hallucinations or other perceptual disturbances (for example, misperceptions) at any stage of the alcohol withdrawal phase. Hallucinations may be visual, tactile or auditory, and may be accompanied by paranoid ideation or delusions, and abnormal affect (agitation, anxiety, dysphoria). Figure 5.1 outlines the alcohol withdrawal syndrome progression.

Figure 5.1: Alcohol withdrawal syndrome progression



Source: NSW Health Department 1999, New South Wales Detoxification Clinical Practice Guidelines, NSW Health Department, ISBN 0 7347 3034

Assessment and treatment matching

Assessment of patients undergoing alcohol withdrawal requires a comprehensive history, examination, investigations and collateral history (described in Chapter 3).

Predictors of withdrawal severity

Predicting the severity of alcohol withdrawal for an individual patient requires assessment of:

- **Current drinking patterns.** No studies of the minimal level of alcohol consumption needed to produce physical dependence have been undertaken. The severity of withdrawal is only moderately predicted by amounts of alcohol consumed. In general, chronic heavy alcohol consumption (for example, 150 grams of alcohol per day) is associated with greater withdrawal severity than lower levels of consumption, although people with lower levels of alcohol use (for example, 80–100 grams per day) can experience severe withdrawal and withdrawal complications.

A predictor of increased alcohol withdrawal severity is the onset of alcohol withdrawal symptoms (such as tremor, nausea, anxiety) upon waking that are normally relieved by early morning drinking.

Individuals with heavy but irregular (for example, 2 to 3 days per week) alcohol consumption – sometimes referred to as ‘binge’ drinking – generally do not experience severe withdrawal, although other conditions (such as epilepsy, anxiety) may be ‘unmasked’ in the period following drinking. However, patients may under-report the amount or frequency of their alcohol use. It is wise to manage such people as if they are at risk for alcohol withdrawal.

- **Past withdrawal experience.** Patients with a history of severe alcohol withdrawal syndrome (such as severe anxiety, seizures, delirium, hallucinations) are more likely to experience such complications in future withdrawal episodes.
- **Concomitant substance use.** Patients with heavy or regular use of other substances (such as benzodiazepines, stimulants, opiates) may experience more severe withdrawal features. In particular, withdrawal from both alcohol and benzodiazepines may increase the risk of withdrawal complications.
- **Concomitant medical or psychiatric conditions.** Patients with concomitant medical conditions (such as sepsis, epilepsy, severe hepatic disease, head injury, pain, nutritional depletion) or psychiatric conditions (such as anxiety, psychosis or depression) are more likely to experience severe withdrawal complications.

Given the variability of alcohol withdrawal severity, it is important to monitor all patients carefully during alcohol withdrawal, particularly those suspected of heavy alcohol use (based on self report, collateral history or clinical presentation) and those with a history of alcohol withdrawal.

Recommendation	Strength of recommendation	Level of evidence
5.1 The risk of severe alcohol withdrawal should be assessed based on current drinking patterns, past withdrawal experience, concomitant substance use, and concomitant medical or psychiatric conditions.	B	II

Objectives of alcohol withdrawal services

Alcohol withdrawal may be intended (an individual voluntarily presenting for treatment), or unplanned following unintended discontinuation of alcohol use (for example, hospitalisation or incarceration). Unplanned withdrawal tends to be most severe.

Withdrawal management should not be seen as a stand-alone treatment that is likely to result in prolonged periods of abstinence, but instead as a transitional step on the long road to abstinence. Indeed, research suggests that withdrawal treatment alone has little, if any, impact on long-term alcohol use. Unfortunately, many patients, families, friends, and health and welfare professionals hold unrealistic expectations about the outcomes of withdrawal services. Many are disappointed when people in these programs either cannot entirely give up drinking, or recommence regular drinking soon after a withdrawal attempt.

A realistic set of objectives for withdrawal services is as follows:

- **To interrupt a pattern of heavy and regular alcohol use.** Some people require the structure and support of withdrawal services in order to stop drinking. While many people have a longer-term goal of achieving abstinence, some may be seeking a temporary break from their alcohol use.
- **To alleviate withdrawal symptoms.** Palliation of the discomfort of alcohol withdrawal symptoms is an important reason for patients presenting for treatment, and one of the primary aims of withdrawal services.
- **To prevent severe withdrawal complications.** Management of alcohol withdrawal aims to prevent or manage potentially life-threatening complications such as seizures, delirium and Wernicke's encephalopathy. Furthermore, alcohol withdrawal can complicate concomitant medical or psychiatric conditions.
- **To facilitate links to ongoing treatment for alcohol dependence.** Withdrawal services are acute services with short-term outcomes. However, alcohol dependence is a chronic relapsing condition, and positive long-term outcomes are more often associated with participation in ongoing treatment such as counselling, self-help, residential rehabilitation and pharmacological approaches (see Chapters 6, 7 and 11). Managed withdrawal provides an opportunity to plan and engage in post-withdrawal treatment services.
- **To get help with any other problems.** While some people will be unwilling or unable to continue in ongoing drug treatment programs, they may benefit from establishing links with primary or specialist health services or welfare services (for example, accommodation, employment services).

Recommendation	Strength of recommendation	Level of evidence
5.2 Successful completion of alcohol withdrawal does not prevent recurrent alcohol consumption and additional interventions are needed to achieve long-term reduction in alcohol consumption.	A	Ia
5.3 Realistic goals of clinicians, patients and their carers for withdrawal services include: interrupting a pattern of heavy and regular alcohol use, alleviating withdrawal symptoms, preventing severe withdrawal complications, facilitating links to ongoing treatment for alcohol dependence, providing help with any other problems (such as accommodation, employment services).	D	IV

Settings for alcohol withdrawal

Alcohol withdrawal management can occur in a variety of settings, ranging from hospital inpatient, community residential (specialised detoxification units) to ambulatory services (outpatient or home-based detoxification services). Their characteristics are described in Table 5.2.

Table 5.2: Characteristics of ambulatory, residential and inpatient hospital withdrawal settings

<p>Ambulatory withdrawal</p>	<p>Occur in the person's 'home' environment or supported accommodation (for example, hostel). Also known as outpatient or home-based detoxification services. Requires:</p> <ul style="list-style-type: none"> • no medical contra-indications: a history of severe withdrawal complications (seizures, delirium, hallucinations) or significant medical or psychiatric comorbidity • a safe, alcohol-free environment • reliable support 'lay' people that can regularly monitor (at least daily during the first 3 or 4 days) and support the patient • regular monitoring by a suitably skilled health professional (such as alcohol and drug worker, nursing or medical professional). Daily review (face-to-face, telephone) for first 3 or 4 days • medication should be closely supervised (for example, daily supplies). Benzodiazepines to be withheld if the patient resumes alcohol use. • patient should have access to 24-hour telephone 'crisis' support. <p>Ambulatory withdrawal has the advantage of no 'waiting lists'; nevertheless, it requires planning and mobilisation of the necessary supports and services.</p> <p>Lower completion rates are generally reported than for residential withdrawal management, but patients who stop drinking at home may be better equipped for continuing abstinence.</p>
<p>Community residential</p>	<p>Residential units exist in most urban and some regional centres. They typically:</p> <ul style="list-style-type: none"> • provide a range of specialist medical, nursing and support services for managing withdrawal, and can facilitate post-withdrawal treatment options • allow for 7 to 10 day admissions • are for people: (a) with moderate to severe alcohol withdrawal or a history of withdrawal complications (seizures, delirium, hallucinations); (b) withdrawing from multiple drugs; (c) unsuitable 'home' environment for attempting ambulatory withdrawal; or (d) for those that have repeatedly failed ambulatory withdrawal • are unable to treat patients with significant medical or psychiatric comorbidity who require hospitalisation; the threshold for admission is generally equivalent to patients with medical problems eligible for outpatient management • often have waiting lists for admission • have higher completion rates than for ambulatory withdrawal.
<p>Inpatient hospital</p>	<p>General or psychiatric hospital admissions are required for people with significant medical (such as delirium) or psychiatric (such as psychosis, high-risk suicidal) conditions, or when the diagnosis is unclear (for example, seizures that require investigation). Further, many patients hospitalised for medical or surgical conditions will experience unplanned and often severe withdrawal.</p> <p>Hospital Addiction Medicine Consultation liaison services should be accessible in hospitals to help assess, manage and plan discharge.</p> <p>In some circumstances, patients may be able to 'step-down' to less intensive settings to complete withdrawal once medically stable.</p>

Selecting withdrawal settings

The choice of withdrawal setting requires a comprehensive clinical assessment and discussion with the patient (and where possible family or carers) about the advantages and disadvantages of each approach. Factors to be considered in determining the most appropriate withdrawal setting for an individual include:

- likely severity of alcohol withdrawal and occurrence of severe withdrawal complications (seizures, delirium, hallucinations)
- use of other substances: people who report heavy use of other drugs (such as benzodiazepines, psycho-stimulants, opiates), may be at increased risk of withdrawal complications and generally need close monitoring and supervision (such as community residential unit)
- concomitant medical or psychiatric conditions: patients with significant comorbidity may need hospital admission until medically cleared; patients may be able to 'step-down' to less intensive withdrawal settings to complete withdrawal once medically stable
- social circumstances, the availability of a safe environment and 'home' supports
- outcome of prior withdrawal attempts: repeated failure at ambulatory withdrawal may indicate the need for referral to a residential detoxification unit
- patient preference and availability of resources.

Table 5.3 summarises the admission criteria for different withdrawal settings.

Table 5.3: Admission criteria for different withdrawal settings

	Ambulatory	Community residential	Inpatient hospital
Predicted alcohol withdrawal severity	Mild–moderate	Moderate–severe	Moderate–severe
Likelihood of severe withdrawal complications	No	Withdrawal complications (seizures, hallucinations)	Withdrawal complications (delirium, unclear cause seizures)
Medical or psychiatric comorbidity	Minor comorbidity	Minor comorbidity	Significant comorbidity
Other substance use	No heavy drug use	Heavy or unstable use of other drugs	–
Social environment	Alcohol-free 'home' Daily monitoring by reliable support people Good access to health care service	Unsupportive home environment	–
Previous attempts	–	Repeated failure at ambulatory withdrawal	–

Some patients wish to attempt ambulatory withdrawal despite multiple failed previous attempts. Further attempts at outpatient withdrawal may be appropriate, however clinicians should identify how this attempt will be different to previous attempts (for example, increased home supports and monitoring), and negotiate with the patient mutually agreed criteria to be met in order to continue with the withdrawal attempt (for example, no alcohol use in first 2 days).

Patients on waiting lists for residential withdrawal units may need support to maintain motivation and avoid high-risk activities until admission.

It is not recommended that benzodiazepines be prescribed in an attempt to alleviate withdrawal symptoms before admission as this may increase the risk of adverse events from the combination of alcohol and benzodiazepines.

Recommendation	Strength of recommendation	Level of evidence
5.4 Ambulatory withdrawal is appropriate for those with mild to moderate predicted withdrawal severity, a safe 'home' environment and social supports, no history of severe withdrawal complications, and no severe concomitant medical, psychiatric or other substance use disorders.	A	IV
5.5 Community residential withdrawal is appropriate for those with predicted moderate to severe withdrawal, a history of severe withdrawal complications, withdrawing from multiple substances, no safe environment or social supports, repeated failed ambulatory withdrawal attempts, and with no severe medical or psychiatric comorbidity.	D	IV
5.6 Inpatient hospital treatment is appropriate for those with severe withdrawal complications (such as delirium or seizures of unknown cause), and/or severe medical or psychiatric comorbidity.	S	–
5.7 Hospital addiction medicine consultation liaison services should be accessible in hospitals to aid assessment, management and discharge planning.	S	–

Monitoring during alcohol withdrawal

All patients in alcohol withdrawal, or who are considered at risk of alcohol withdrawal, should be monitored regularly for:

- **Physical signs.** This includes level of hydration, pulse rate, blood pressure, temperature and level of consciousness (especially if medicated).
- **Severity of alcohol withdrawal.** It is beneficial to use an alcohol withdrawal rating scale to assess the severity of withdrawal, to guide treatment, and to help clinicians communicate more objectively about the severity and management of alcohol withdrawal. Alcohol withdrawal scales are described below; see Appendix 3 for the instruments.
- **General progress during withdrawal episode.** This includes ongoing level of motivation, alcohol and other drug use during ambulatory withdrawal (breathalyser readings and/or urine drug screens may be clinically indicated), response to any medication(s), and patient concerns or difficulties.

Clinical Institute Withdrawal Assessment for Alcohol

The Clinical Institute Withdrawal Assessment for Alcohol (CIWA-Ar) revised is a 10-item, validated scale. CIWA-Ar scores below 10 are considered mild withdrawal; between 10 and 20 are moderate withdrawal, and above 20 are considered severe withdrawal. Patients with CIWA-Ar scores of more than 10 are considered to be at high risk of developing withdrawal complications if not medicated.

Frequency of CIWA-Ar monitoring depends upon treatment setting and clinical condition of the patient. Patients with CIWA-Ar scores of more than 10 need frequent monitoring (at least 4 hourly), and patients with severe withdrawal (CIWA-Ar score of more than 20) should be monitored every 2 hours.

Alcohol Withdrawal Symptoms – Rating Scale

An alternative scale is the Alcohol Withdrawal Symptoms – Rating Scale (AWS) (see Appendix 3). Validation of the AWS has not been published; however it has been widely used in Australian conditions and is considered acceptable for use. An AWS score of up to 4 indicates mild withdrawal, 5 to 7 moderate withdrawal, 8 to 14 severe withdrawal, and 15 or more very severe withdrawal. Close monitoring is advised at least every 4 hours for those with mild withdrawal, and every 2 hours for severe withdrawal.

Short Alcohol Withdrawal Scale

The Short Alcohol Withdrawal Scale (SAWS) is a self-completion scale used once a day, and is suited to ambulatory withdrawal settings (see Appendix 3). Other validated scales may be used according to local preference.

Limitations of withdrawal scales

Alcohol withdrawal rating scales are not to be used as diagnostic tools as many other conditions may produce similar signs and symptoms, for example:

- medical conditions (such as sepsis, hepatic encephalopathy, severe pain, other causes of tremor)
- psychiatric conditions (such as anxiety disorder)
- other drug withdrawal syndromes (such as benzodiazepine, stimulant or opiate withdrawal).

Using alcohol withdrawal rating scales in these cases can lead to inappropriate diagnosis of alcohol withdrawal and its severity.

They should not be used to direct medication (for example, symptom-triggered regimens) in patients with these conditions, including most hospitalised patients. Alcohol withdrawal scales have a limited role under these circumstances, and health professionals should consult a specialist drug and alcohol clinician about monitoring and management needs.

Scoring of alcohol withdrawal scales is typically highly variable in clinical practice and often not reproducible; clinicians should review scores before making management decisions.

Recommendation	Strength of recommendation	Level of evidence
5.8 Patients withdrawing from alcohol should be regularly monitored for physical signs, severity of alcohol withdrawal and general progress during withdrawal.	S	–
5.9 Alcohol withdrawal scales (CIWA-Ar,AWS) can be used to assess withdrawal severity, to guide treatment (such as symptom-triggered medication regimens) and to aid objective communication between clinicians; but should not be used as diagnostic tools.	A	Ia
5.10 Alcohol withdrawal scales should not be used to guide treatment in patients concurrently withdrawing from other substances, or with significant medical or psychiatric comorbidity. Health professionals should consult a specialist drug and alcohol clinician about monitoring and management needs.	B	Ib
5.11 Scores on alcohol withdrawal scales are not always reproducible and should be checked before using them to make management decisions.	S	–

Supportive care

Supportive care needs to include provision of sufficient information to patients (and carers); an environment and support that is conducive to recovery; supportive counselling; adequate diet, nutrition (including supplements) and rehydration; encouragement to develop appropriate sleep and relaxation habits; and facilitation of links to other services.

Patient information

Patients (and carers) generally benefit from information about:

- the likely nature, severity and duration of symptoms during withdrawal
- strategies for coping with symptoms and cravings
- strategies to reduce high-risk situations
- the role of medication.

Patients often have limited concentration during withdrawal; consequently the clinician may have to repeat or re-phrase information before the patient can fully understand. Written information is valuable in these circumstances, and is also recommended for carers supporting patients through withdrawal. Examples of patient information are in Appendix 6.

Recommendation	Strength of recommendation	Level of evidence
5.12 Patients (and carers) should be provided with information about the likely nature and course of alcohol withdrawal, and strategies to cope with common symptoms and cravings	C	III

Environment and support

Patients attempting alcohol withdrawal should be in an environment that is quiet, non-stimulating, and non-threatening, and where alcohol and other drugs are not readily available.

A range of strategies should be used to reduce anxiety, and these are particularly important for those experiencing withdrawal delirium or hallucinations. Such strategies should include:

- employing a slow, steady, non-threatening approach
- explaining all interventions clearly
- speaking slowly and distinctly in a friendly manner
- maintaining eye contact when speaking
- avoiding confrontation and arguments
- testing the patient's reality-base and orientation repeatedly and, if necessary, re-acquainting the patient with his environment
- explaining to the patient that the unreal nature of illusions and hallucinations may cause anxiety and are likely to be part of the alcohol withdrawal syndrome
- recommending a night light to reduce the likelihood of perceptual errors and exacerbation of anxiety and psychotic phenomena during the night.

Recommendation	Strength of recommendation	Level of evidence
5.13 Treatment environment should be quiet, non-stimulating, and non-threatening, and where alcohol and other drugs are not available.	S	–

Supportive counselling

Counselling during the withdrawal episode should be aimed specifically at supporting the patient through withdrawal symptoms, maintaining motivation, and facilitating post-withdrawal links.

An important area is that of coping with cravings during withdrawal. One recommended approach particularly suitable for ambulatory withdrawal management is the Three-D method – Delay, Distract and Desist – see box.

Crisis intervention may be needed during a withdrawal episode to address adequate accommodation, food or other urgent welfare issues. Many patients will want to address a range of personal, emotional or relationship problems at the start of treatment; however, these should be deferred until after withdrawal as:

- attempting to work through such issues will almost certainly be anxiety provoking, which merely intensifies cravings and jeopardises withdrawal completion
- people in withdrawal tend to be irritable, agitated and run-down – not the optimal frame of mind in which to solve major long-standing problems.

Assure your patients that you understand that they have important issues they want to work through, explain why they are being deferred, and that there will be opportunities to address them as part of ongoing treatment after withdrawal.

Many patients undergoing ambulatory withdrawal may also benefit from 24-hour telephone counselling services for help when health professionals or regular supports are unavailable. Each state in Australia has telephone alcohol and drug services (see Appendix 6).

Recommendation	Strength of recommendation	Level of evidence
5.14 Supportive counselling should be provided to maintain motivation, provide strategies for coping with symptoms, and reduce high-risk situations.	D	III

COPING WITH CRAVINGS

'Cravings' are urges to drink alcohol. They are a normal part of any addiction and withdrawal. Cravings vary in intensity with time, and are only severe for short periods (for example, less than one hour). Cravings are often triggered by opportunities to drink, physical or psychological discomfort. Cravings generally get easier to deal with the longer a person goes without drinking.

It is important that patients are prepared for cravings. The goal is to see through the brief period of severe craving. The Three-D method has been successful for many people when they are experiencing severe cravings, specifically:

- **Delay** the decision as to whether you will drink for one hour. You may or may not drink, but that is something to be decided later (when the severity of the craving has reduced).
- **Distract** yourself with an activity during this hour that will take your mind off whether you will drink or not.
- **Desist:** After the hour, say to yourself: 'Why I don't want to drink' and 'What have I got to lose?'

By this stage the craving should have settled down – although probably not gone away. The patient should re-examine the reasons they want to stop drinking, why they are trying to withdraw, and importantly, what they will be returning to if they start drinking again.

Diet, nutrition and rehydration

Many chronic heavy drinkers suffer from nutritional deficits, and can become dehydrated during alcohol withdrawal. Patients should be assessed for dehydration, and their fluid intake and output monitored. Oral fluid intake is generally preferred, usually in excess of 2 litres per day (up to 5 litres if the patient is suffering diarrhoea, nausea or profuse sweating). Patients with severe dehydration and/or those unable to tolerate oral fluids will require hospitalisation, investigation and correction of electrolyte abnormalities intravenous fluid replacement and 24-hour fluid monitoring.

Patient's nutritional intake should be monitored. Many experience nausea and/or diarrhoea during withdrawal, and frequent, light meals are generally better tolerated in the first few days of withdrawal than infrequent, large meals (see 'Intravenous fluids and nutritional supplements' below).

Recommendation	Strength of recommendation	Level of evidence
5.15 Clinicians should ensure oral rehydration is adequate. Intravenous fluids may be necessary in severe dehydration and/or in those not tolerating oral fluids.	S	–

Thiamine and other supplements

Thiamine supplements are recommended for all people undergoing alcohol withdrawal (see 'Wernicke–Korsakoff's syndrome' below). In patients showing no clinical features of Wernicke's encephalopathy or memory impairment, thiamine is recommended as a prophylactic measure.

The dose, route and duration of thiamine administration depend on the patient's nutritional status. For example, healthy patients with good dietary intake may be administered oral thiamine 300 mg per day (100 mg three times daily for 3 to 5 days, and maintained on 100 mg oral thiamine for a further 4 to 9 days (for a total of 1 to 2 weeks of oral thiamine).

Intestinal absorption of oral thiamine supplements is slow and may be incomplete in patients with poor nutritional status, hence:

- Chronic drinkers with poor dietary intake and general poor nutritional state should be administered parenteral thiamine doses. The recommended dose of thiamine is 300 mg intramuscularly or intravenously per day for 3 to 5 days, and subsequent oral thiamine doses of 300 mg per day for several weeks.
- Alcohol is associated with coagulopathy that may render intramuscular injection unsafe.

Parenteral carbohydrates can cause rapid absorption of thiamine in peripheral tissues and precipitate Wernicke's encephalopathy.

- Thiamine (oral or intramuscular) should be given **before** any carbohydrate load (for example, intravenous glucose).

Deficiencies of other B-complex vitamins, vitamin C, zinc and magnesium are not uncommon and an oral multivitamin preparation can be given to nutritionally depleted patients for several days. Thiamine supplementation should be continued indefinitely in an alcohol-dependent patient who continues to drink alcohol.

Recommendation	Strength of recommendation	Level of evidence
5.16 Thiamine should be provided to all patients undergoing alcohol withdrawal to prevent Wernicke's encephalopathy.	D	IV
5.17 Thiamine should be given before any carbohydrate load (such as intravenous glucose) as carbohydrates can cause rapid use or depletion of thiamine and precipitate Wernicke's encephalopathy.	D	III
5.18 Healthy patients with good dietary intake should be administered oral thiamine 300 mg per day for 3 to 5 days, and maintained on 100 mg oral thiamine for a further 4 to 9 days (total of 1 to 2 weeks of thiamine).	D	IV
5.19 Chronic drinkers with poor dietary intake and general poor nutritional state should be administered parenteral (intramuscular or intravenous) thiamine doses of 300 mg per day for 3 to 5 days, with subsequent oral thiamine doses of 300 mg per day for several weeks. The intramuscular route should not be used for patients with coagulopathy.	D	Ib
5.20 Thiamine supplementation should be continued indefinitely in an alcohol-dependent patient who continues to drink alcohol.	S	–

Sleep and relaxation

Sleep disturbance is common in heavy drinkers. Many patients have poor sleep behaviours, and often have a history of relying on alcohol or medications to initiate sleep. While medication such as benzodiazepines can facilitate sleep during the first few days of withdrawal, long-term use of benzodiazepines or other sedatives for sleep following alcohol withdrawal (more than one week) should be discouraged. Most patients find that normal sleep routine can be established within weeks of stopping alcohol use, and appropriate sleep behaviours should be encouraged. Patient literature about sleep and relaxation techniques (see Appendix 6) should be provided.

Likewise, many patients experience difficulties with anxiety, irritability and even panic attacks during and after alcohol withdrawal. Benzodiazepines or other sedatives have a limited role, and behavioural approaches to relaxation and evidence-based approaches to anxiety management should be encouraged.

Recommendation	Strength of recommendation	Level of evidence
5.21 Sedatives (such as benzodiazepines) should not be continued beyond the first week of withdrawal. Behavioural approaches to management of anxiety and sleep problems should be encouraged.	D	IV

Facilitating links with other services for further treatment and support

A focus of counselling strategies during withdrawal is examining post-withdrawal treatment options, and facilitating engagement with these services. This may include:

- primary care
- counselling (for example, relapse prevention)
- residential rehabilitation
- self-help
- medications for relapse prevention.

Recommendation	Strength of recommendation	Level of evidence
5.22 Clinicians should facilitate links to post-withdrawal treatment services during withdrawal treatment.	D	III

Medications for managing alcohol withdrawal

Most people attempting alcohol withdrawal will not experience severe withdrawal symptoms or withdrawal complications (such as seizures or delirium) that require medication. Nevertheless, medication is often used to assist alcohol withdrawal as:

- it can be difficult to predict whether a particular individual will experience severe withdrawal
- there is significant morbidity and mortality associated with untreated withdrawal complications of delirium and seizures
- outcomes such as rates of withdrawal completion and symptom relief are enhanced with the use of medication
- withdrawal medication (particularly benzodiazepines) is simple to use, effective, inexpensive and has minimal adverse events.

Benzodiazepines

Benzodiazepines are anti-anxiety and sedative-hypnotic medications that enhance gamma-aminobutyric acid (GABA) activity in the central nervous system. A wide variety of benzodiazepines have been used for alcohol withdrawal. In general, long-acting benzodiazepines with a rapid onset of action (particularly important in seizure prophylaxis) are most commonly recommended.

Diazepam is the benzodiazepine of choice. Diazepam is well absorbed orally, has a rapid onset of action (within one hour), and has prolonged duration of effects (up to several days), important in preventing symptom recurrence between doses. **Chlordiazepoxide**, a long-acting and rapid-onset benzodiazepine, is widely used internationally but is not registered in Australia.

In certain clinical circumstances, long-acting benzodiazepines such as diazepam may be problematic. Shorter acting benzodiazepines (such as midazolam, lorazepam, oxazepam) should be used where there is concern about prolonged sedation, such as in the elderly, recent head injury, liver failure, respiratory failure, other serious medical illness or in severely obese patients (due to accumulation of lipophilic diazepam and active metabolites). Short-acting benzodiazepines have a simpler hepatic metabolism (conjugation that is less affected by liver disease or aging) without active metabolites, and can be more easily discontinued in the event of clinical deterioration such as head injury.

- **Lorazepam** is the preferred benzodiazepine under these circumstances as it has rapid onset after oral administration (within 2 hours) and has short to medium duration of action (half life of 10 to 20 hours); 2 mg oral lorazepam is equipotent to 10 mg oral diazepam.
- **Oxazepam** has also been used in Australia under these circumstances (onset of action within 2 hours, half-life of 5 to 10 hours); 15 to 30 mg oxazepam is approximately equipotent to 5 mg diazepam.
- **Midazolam** by intravenous bolus or infusion is preferred where rapid, but easily reversible, sedation is required (for example, in patient with recent seizure and with suspected head injury).

Recommendation	Strength of recommendation	Level of evidence
5.23 Benzodiazepines are the recommended medication in managing alcohol withdrawal. In Australia, diazepam is recommended as first-line treatment because of its rapid onset of action, long half-life and evidence for effectiveness.	A	Ia
5.24 Shorter-acting benzodiazepines (lorazepam, oxazepam, midazolam) may be indicated where the clinician is concerned about accumulation and over sedation from diazepam, such as in the elderly, severe liver disease, recent head injury, respiratory failure, in obese patients, or where the diagnosis is unclear.	D	III
5.25 Benzodiazepines should not be continued beyond the first week for managing alcohol withdrawal due to the risk of rebound phenomenon and dependence.	D	III

The three most commonly used benzodiazepine regimens are symptom-triggered therapy, loading dose therapy and fixed-schedule therapy. Figure 5.2 shows a schematic for use of the different benzodiazepine regimens.

Symptom-triggered therapy

Symptom-triggered therapy administers medication only when the patient develops moderate alcohol withdrawal symptoms, and relies upon linking medication (for example, diazepam doses) with scores on a frequently administered withdrawal scale (such as CIWA-Ar or AWS; Table 5.4 shows an example of a symptom-triggered regimen). Symptom-

triggered regimens have the advantage of better tailoring medication to the needs of individuals, and have been shown – in specialist residential detoxification settings – to result in less benzodiazepine use than fixed-dose regimens. However, symptom-triggered regimens:

- are generally not suited to ambulatory withdrawal settings; they require a residential withdrawal setting
- should not be used in patients with a history of withdrawal seizures, as seizures may occur before the onset of other withdrawal features
- should not be used in patients with heavy use of other drugs or significant concomitant medical or psychiatric conditions that may invalidate use of withdrawal scales (see 'Limitations of withdrawal scales' above); this will include many people undergoing alcohol withdrawal in general or psychiatric hospital settings
- require good protocol adherence, including regular patient monitoring and staff trained in the use of scales and symptom-triggered regimens; where this cannot be guaranteed, fixed regimens are preferable.

Table 5.4: Example of symptom-triggered regimen

	CIWA-Ar	AWS	Frequency of monitoring	Oral diazepam dose using a symptom-triggered regimen*
Mild	< 10	< 4	6 hourly	No dose required
Moderate	10–20	4–7	4 hourly	5–10 mg
Severe	> 20	> 7	2 hourly	20 mg

Note: * Some patients have low tolerance of withdrawal symptoms and may need additional doses of diazepam (for example, 5 to 10 mg) or other symptomatic medication on an as-needed basis. CIWA-Ar – Clinical Institute Withdrawal Assessment for Alcohol Scale; AWS – Alcohol Withdrawal Symptoms – Rating Scale

The typical duration of diazepam treatment is 1 to 2 days. More prolonged treatment is needed for unusually severe withdrawal but the possibility of benzodiazepine dependence and/or mental comorbidity should be considered. Excessively prolonged therapy can also contribute to sedation, drug-induced delirium, and extended hospitalisation.

Recommendation	Strength of recommendation	Level of evidence
5.26 Diazepam should be administered in a symptom-triggered regimen in residential withdrawal settings for people with no concomitant medical, psychiatric or substance use disorders.	B	1a

Loading dose therapy

Loading dose regimens (also called 'front-loading') quickly administer high doses of benzodiazepines in the early stages of alcohol withdrawal and are indicated in:

- managing patients with a history of severe withdrawal complications (seizures, delirium)
- managing patients presenting in severe alcohol withdrawal and/or severe withdrawal complications (delirium, hallucinations, following an alcohol withdrawal seizure).

A common diazepam-loading regimen under these circumstances is 20 mg orally every 2 hours until reaching 60–80 mg or the patient is sedated. Medical review should occur if the patient remains agitated after 80 mg. Other causes of agitation should be excluded, and further doses of diazepam may be needed. Specialist advice should be sought if necessary.

The dose of 80 mg diazepam will have significant sedative effects for several days, and this is generally sufficient to prevent severe withdrawal from occurring during the remainder of the withdrawal episode. While no further doses of diazepam may be needed, it is common for further doses of diazepam to be administered over the subsequent 2 to 3 days for symptomatic relief, as either a fixed reducing regimen (for example, 10 mg four times a day on day 2, 10 mg twice a day on day 3, 5 mg twice a day on day 4); or as required (for example, 5 to 10 mg 6 hourly as needed, based on clinical observation or alcohol withdrawal scale scores).

Recommendation	Strength of recommendation	Level of evidence
5.27 Diazepam should be administered in a loading regimen (20 mg 2 hourly until 60 to 80 mg or light sedation) in patients with a history of severe withdrawal complications (seizures, delirium); in patients presenting in severe alcohol withdrawal and/or severe withdrawal complications (delirium, hallucinations, following withdrawal seizure).	B	Ib

Fixed-schedule therapy

Benzodiazepines given at fixed dosing intervals are a common therapy for alcohol withdrawal management, and are well suited to ambulatory withdrawal, community residential and inpatient withdrawal settings. Fixed schedules are also appropriate for complex hospitalised patients, ideally with daily review by specialist drug and alcohol clinicians. Fixed schedule regimens typically involve reducing doses over a 3 to 6 day period, and require regular clinical review (minimum of daily) to ensure the patient is not over or under-medicated (Table 5.5 provides an example of a fixed-schedule regimen). Fixed schedule regimens may be supplemented with additional diazepam as needed for people with low tolerance of withdrawal discomfort (for example, 5 mg 6 hourly as needed, based on clinical observation or alcohol withdrawal scale scores).

Access to diazepam doses should be restricted (for example, daily dispensing) and/or doses supervised by carers for patients undertaking ambulatory withdrawal in order to prevent misuse of medication. Diazepam should not be used if the patient continues to drink alcohol.

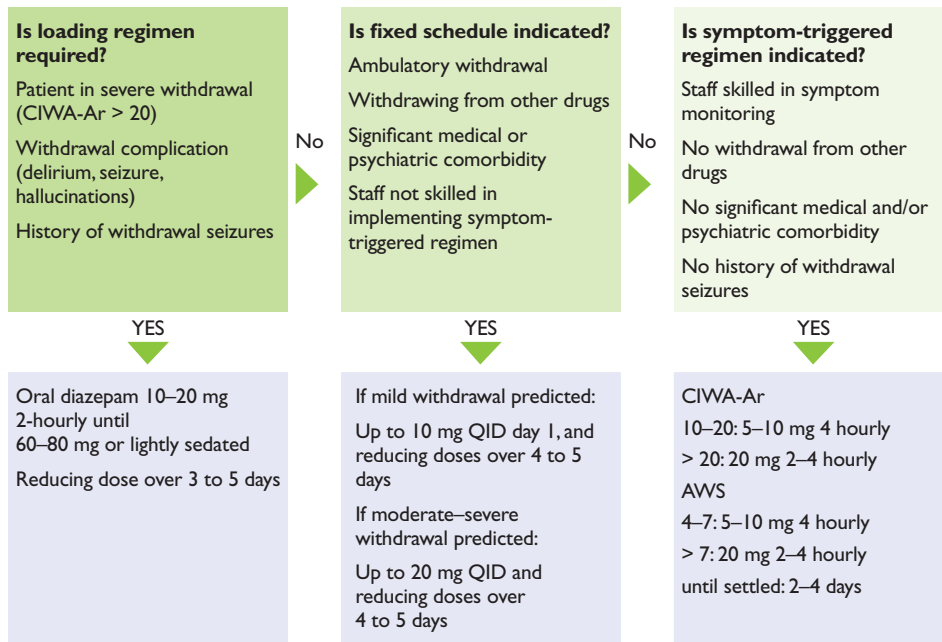
Table 5.5: Example of fixed-schedule regimen

Moderate to severe withdrawal predicted	
	Oral diazepam dose*
Day 1	20 mg four times a day
Day 2	10 mg four times a day
Day 3	10 mg twice a day
Day 4	5 mg twice a day
Day 5	5 mg 12 hourly as needed
Mild withdrawal predicted (also suitable for ambulatory alcohol withdrawal)	
	Oral diazepam dose*
Day 1	10 mg four times a day
Day 2	10 mg three times a day
Day 3	10 mg twice a day
Day 4	5 mg twice a day
Day 5	5 mg at night as needed

Note: * In practice, a hybrid approach can be recommended with fixed schedule plus an additional diazepam dose (for example, 5 mg 6 to 12 hourly as needed, based on clinical observation or alcohol withdrawal scale scores).

Recommendation	Strength of recommendation	Level of evidence
5.28 Diazepam should be administered in a fixed dose regimen in ambulatory settings, or for those with concomitant medical, psychiatric or substance use disorders.	C	Ib

Figure 5.2: Selecting benzodiazepine regimens for alcohol withdrawal



Notes: CIWA-Ar – Clinical Institute Withdrawal Assessment for Alcohol Scale; AWS – Alcohol Withdrawal Symptoms – Rating Scale; QID – four times a day

Alternative, symptomatic and other medications

Benzodiazepines are considered the first line treatment for alcohol withdrawal management. However, benzodiazepines are not recommended, or need to be used cautiously, in circumstances where they:

- have been misused or abused by patients (for example, higher doses, continued alcohol use); in which case, greater supervision of medication, such as residential withdrawal setting or limit access to benzodiazepines in ambulatory settings, is needed
- cause paradoxical reactions (such as violence, agitation) or severe alterations in mental status (such as confusion, delirium) in a minority of people; in which case, alternative medication approaches may need to be considered.

Anticonvulsants

Carbamazepine (600 to 1200 mg per day) effectively minimises alcohol withdrawal symptoms and prevents alcohol withdrawal seizures, but does not effectively prevent recurrent (further) seizures in a withdrawal episode.

Phenytoin and valproate do not effectively prevent the onset of alcohol withdrawal seizures and are not recommended. The role of other anticonvulsants (such as gabapentin,

topiramate) is yet to be demonstrated in controlled studies compared to gold standard treatment, and are not recommended at this stage.

There appears to be no advantage in adding anticonvulsants to benzodiazepines for preventing alcohol withdrawal seizures.

Patients already prescribed and regularly taking anticonvulsants should continue this medication during withdrawal. Many heavy drinkers have poor adherence to anticonvulsants while drinking, and may be at risk of seizures due to recent cessation of anticonvulsants. Measurement of anticonvulsant plasma levels should be considered before administering anticonvulsants.

See 'Treatment of severe withdrawal complications' for discussion of patient management following alcohol withdrawal seizure, including the role of anticonvulsants in preventing further seizures following withdrawal.

Recommendation	Strength of recommendation	Level of evidence
5.29 Carbamazepine is safe and effective as an alternative to benzodiazepines, although it is not effective in preventing further seizures in the same withdrawal episode.	A	Ia
5.30 Phenytoin and valproate are not effective in preventing alcohol withdrawal seizures and are not recommended.	A	Ia
5.31 Newer anticonvulsant agents (such as gabapentin) are not recommended at this stage due to limited clinical evidence.	D	IV
5.32 There is no benefit in adding anticonvulsants to benzodiazepines to manage alcohol withdrawal.	A	Ia
5.33 Anticonvulsant medications should be continued in patients who take them regularly (such as for epilepsy not related to withdrawal).	S	–

Antipsychotic medications

Antipsychotic medication (such as phenothiazines) when used alone may increase seizure risk and do not prevent the onset of delirium. They should only be used in conjunction with benzodiazepines to manage hallucinations or agitation associated with delirium that have not responded to adequate doses of benzodiazepines (for example, at least 60–80 mg diazepam loading).

No controlled trials demonstrating the superiority of different antipsychotic medications exist, and practitioners should use medications with which they are most familiar. Examples of regimens include:

- haloperidol 2.5 to 10 mg oral or intramuscular, repeated as required
- olanzapine 5 to 10 mg oral or buccal dose, repeated as required
- risperidone 1 to 5 mg, oral or intramuscular, twice daily, repeated as required.

Recommendation	Strength of recommendation	Level of evidence
5.34 Antipsychotic medications should only be used as an adjunct to adequate benzodiazepine therapy for hallucinations or agitated delirium. They should not be used as stand-alone medication for withdrawal.	A	Ia

Anti-hypertensive agents

While elevated blood pressure during alcohol withdrawal is common due to autonomic (adrenergic) hyperactivity, it generally resolves spontaneously following withdrawal, and is usually well managed by adequate doses of benzodiazepines (for example, at least 60 mg of diazepam in the preceding 24 hours). In cases where blood pressure remains markedly elevated (for example, greater than 200 mg systolic, greater than 130 diastolic) on repeated measurements, despite adequate benzodiazepine loading, a beta-blocker (such as atenolol or propranolol) is recommended.

Recommendation	Strength of recommendation	Level of evidence
5.35 Anti-hypertensive agents (beta-blockers) should be used for managing extreme hypertension that has not responded to adequate doses of diazepam for alcohol withdrawal.	D	IV

Symptomatic medication

A range of medications is commonly used to manage various symptoms of alcohol withdrawal, despite the absence of an empirical evidence base in alcohol withdrawal. Examples include:

- paracetamol up to 1 gm twice a day as needed for headache
- anti-emetics for nausea (for example, metoclopramide 10 mg 6 hourly as needed, prochlorperazine 5 mg oral or intramuscular 6 hourly)
- loperamide for diarrhoea.

Recommendation	Strength of recommendation	Level of evidence
5.36 A range of symptomatic medications may be used for addressing specific symptoms (such as paracetamol for headache, anti-emetics, anti-diarrhoeal agents).	D	IV

Electrolyte disturbances

Hypokalaemia and hypomagnesaemia should be corrected using oral supplements. Hyponatraemia is usually self-limiting and should not be aggressively corrected because of the risk of central pontine myelinolysis.

Recommendation	Strength of recommendation	Level of evidence
5.37 Electrolyte replacement may be a necessary adjunctive treatment for patients with electrolyte abnormalities (such as hypomagnesaemia, hypokalaemia). Hyponatraemia should not be aggressively corrected due to the risk of central pontine myelinolysis.	S	–

Other medications

Chlormethiazole is a short-acting sedative and anticonvulsant medication that was widely used for treating alcohol withdrawal before the advent of benzodiazepines. It is no longer recommended for managing alcohol withdrawal due to its risk of respiratory depression and death in overdose or in combination with alcohol or other sedatives.

Alcohol (ethanol), gamma-hydroxybutyric acid (GHB), barbiturates, beta-blockers, clonidine, or magnesium infusions have no role in managing alcohol withdrawal.

Baclofen, a GABA-B receptor agonist, used in clinical practice as a skeletal muscle relaxant, has been shown to suppress symptoms of alcohol withdrawal in preliminary clinical studies. It cannot be recommended for use in routine treatment of alcohol withdrawal at this stage.

Recommendation	Strength of recommendation	Level of evidence
5.38 Chlormethiazole, barbiturates, alcohol, beta-blockers, clonidine and gamma-hydroxybutyric acid (GHB) are not recommended in the routine management of alcohol withdrawal.	A	Ia

Treating severe withdrawal complications

Severe withdrawal complications include seizures, hallucinations and delirium.

Alcohol withdrawal seizures

Seizures may occur as part of the alcohol withdrawal syndrome. Alcohol acts on the brain through various mechanisms that influence seizure threshold, including calcium and chloride ion flow through glutamate N-methyl D-aspartate (NMDA) and gamma-aminobutyric acid type A (GABA-A) receptors. Chronic alcohol use results in adaptive changes to the effects of alcohol, and the seizure threshold is lowered as a rebound phenomenon when alcohol intake is stopped.

Clinical presentation and prevalence

Alcohol withdrawal seizures typically occur 6 to 48 hours after the last drink is consumed (50% between 13 and 24 hours; 90% within 48 hours), and are usually generalised (tonic-clonic) seizures. New-onset alcohol withdrawal seizures are linked to heavy alcohol consumption.

Withdrawal seizures occur as blood alcohol levels fall, and in some severely dependent drinkers, seizures can occur even if the patient is still intoxicated or has consumed alcohol recently and the blood alcohol level is high (for example, greater than 0.10).

The risk of seizure recurrence within 6 to 12 hours after a seizure is estimated at between 13 and 24 per cent. While the incidence of status epilepticus is low, alcohol withdrawal is major cause of this life threatening condition.

The prevalence of alcohol withdrawal seizures is estimated at between 2 and 9 per cent of alcohol dependent people. People who have experienced an alcohol withdrawal seizure are more likely to experience further seizures in subsequent alcohol withdrawal episodes.

The prevalence of seizures (all causes) in alcohol dependent people is up to 15 per cent, estimated to be at least three times higher than the general population. It is estimated that alcohol-related seizures account for one-third of all seizure-related hospital admissions.

Other causes of seizures in heavy drinkers

Heavy alcohol use can also contribute to seizures through other conditions including:

- concurrent metabolic, infectious, traumatic, neoplastic or cerebrovascular conditions
- concomitant use of other substances (particularly benzodiazepines).

Furthermore, some literature suggests that long-term neurotoxic effects of high-level alcohol consumption may lead to epilepsy.

Seizures under these circumstances may be atypical of alcohol withdrawal seizures in onset or type (for example, partial-onset seizures). However, seizures of other causes can present clinically as alcohol withdrawal seizures.

Pharmacological approaches to preventing seizures

Systematic reviews indicate that benzodiazepines effectively prevent alcohol withdrawal seizures, and are effective in preventing recurrent (further) seizures in a withdrawal episode.

Benzodiazepines with rapid onset (such as diazepam, lorazepam) are recommended. The long duration of diazepam is generally preferred in most cases; however, a short-acting benzodiazepine (such as lorazepam, midazolam) may be preferred where the diagnosis is unclear (for example, possible head injury), or due to severe hepatic failure.

Carbamazepine effectively prevents alcohol withdrawal seizures, but is not effective in preventing recurrent (further) seizures in a withdrawal episode.

There appears to be no advantage in adding anticonvulsants to benzodiazepines for preventing alcohol withdrawal seizures.

Phenytoin and valproate do not effectively prevent the onset of alcohol withdrawal seizures and are not recommended. The role of other anticonvulsants (such as gabapentin, topiramate) is yet to be demonstrated, and while their GABAergic actions suggest they may be useful, they are not recommended at this stage.

Prevention of seizures in patients undergoing alcohol withdrawal is as follows:

- In patients with no prior seizure history and not in severe alcohol withdrawal: a symptom-triggered or fixed schedule diazepam regimen is recommended (see 'Medications for managing alcohol withdrawal' above for discussion of regimens).
- In patients with prior seizure history, or in severe alcohol withdrawal: diazepam loading is recommended (20 mg every 2 hours until 60–80 mg or patient lightly sedated), and reducing doses on subsequent days.

Assessing and managing seizures in heavy drinkers

Many heavy drinkers present to services (such as hospital, paramedic) following a seizure, and can pose a diagnostic dilemma for clinicians. The diagnosis of alcohol withdrawal seizures is one of exclusion of other causes of seizures.

An alcohol withdrawal seizure can be diagnosed if none of the following criteria are present:

- clinical features or suspicion of other causes of seizures (such as head injury, metabolic, infectious, neoplastic, cerebrovascular disorders)

- no previous seizure history
- the patient experiences two or more seizures in succession
- partial-onset (focal) seizures
- seizure occurring more than 48 hours after last drink
- no recent heavy alcohol use or other features of alcohol withdrawal.

If any of the above criteria are present, alcohol withdrawal seizures **should not** be assumed. The patient should be admitted into hospital, assessed for other causes of seizures, and monitored for at least 24 hours. Careful collateral history should be taken where possible. Table 5.6 identifies common differences between alcohol withdrawal seizures and epileptic seizures.

Table 5.6: Post-ictal signs and symptoms: comparing epilepsy and alcohol withdrawal seizures

	Epilepsy	Alcohol withdrawal seizures
Consciousness level	Post-ictal sleep/drowsy	Sleeplessness
Mood	Calm	Anxiety, agitated
Tremor	No	Yes
Sweating	No	Yes
BP, PR	Normal	Elevated
Temperature	Normal/slight fever	Fever (lower than 38.5°C)
Arterial bloods	Normal	Respiratory alkalosis
EEG	Pathology	Normal, low-amplitude

Notes: EEG – electroencephalogram; BP, PR – blood pressure, pulse rate

Source: European Federation of Neurological Societies Taskforce 2005, EFNS guideline on the diagnosis and management of alcohol-related seizures, Report of the European Federation of Neurological Societies Taskforce, available at <http://www.guideline.gov/summary/summary.aspx?doc_id=9648>.

Investigations should include:

- brain imaging (such as CT, MRI)
- biochemical investigations, including breath/blood alcohol estimates
- urine collected for drug screening (include screen for benzodiazepines, cocaine, amphetamines, tricyclic antidepressants)
- electroencephalogram (EEG) may be warranted – the typical post-ictal finding in alcohol withdrawal seizures is a normal, low-amplitude EEG recording.

While investigations are being conducted, the patient requires:

- regular monitoring, including vital signs, alcohol withdrawal scales (for example, 1 to 2 hourly) and neurological observations
- supportive management, including nursing in a quiet environment away from excessive sensory stimuli and rehydration.

Repeat seizures occur in up to one-quarter of patients who experience an alcohol withdrawal seizure. Where the **likely diagnosis** is alcohol withdrawal seizures, patients should be administered benzodiazepines to prevent further seizures. A typical regimen should include:

- diazepam loading (10–20 mg oral)
- lorazepam (1–2 mg oral) if the clinician is concerned about respiratory or neurological function, or
- midazolam (2–10 mg intravenous infusion if parenteral treatment is required and subject to close direct monitoring of response, airway and saturation).

Where the diagnosis of alcohol withdrawal seizures can be clearly **established**, the following management plan is recommended:

- admission into a supervised withdrawal setting for at least 48 to 72 hours
- regular monitoring, including vital signs, alcohol withdrawal scales and neurological observations
- thiamine administration (100 mg three times daily intramuscular or intravenous) before carbohydrate
- supportive management, including nursing in a quiet environment away from excessive sensory stimuli and rehydration
- diazepam loading to prevent further alcohol withdrawal seizures.

Diazepam (20 mg) should be administered every 2 hours, reaching a total dose of 60–80 mg diazepam over the first 6 to 8 hours, or until the patient is lightly sedated. The patient should be medically reviewed if they require more than 80 mg diazepam to ameliorate withdrawal or achieve sedation. On subsequent days, reducing doses of diazepam can be administered to lessen withdrawal discomfort (for example, 40 mg total dose on day 2; 20 mg total on day 3). If clinicians are concerned about accumulation of long-acting benzodiazepine, lorazepam (or oxazepam) can be used.

Carbamazepine effectively prevents seizures in alcohol dependent people, but it does not effectively prevent recurrent seizures or onset of alcohol withdrawal delirium, and is therefore not generally recommended.

Recommendation	Strength of recommendation	Level of evidence
5.39 Alcohol withdrawal seizure should only be assumed if the clinical presentation is typical of an alcohol withdrawal seizure, no other causes of seizure are suspected, and the patient has a history of previous alcohol withdrawal seizures. All other cases need full investigation.	B	II
5.40 Heavy drinkers with a seizure of unknown cause should be admitted to hospital and monitored for at least 24 hours. Investigations include biochemical tests and neuro-imaging, and possibly EEG.	C	III
5.41 Loading with benzodiazepines (diazepam, lorazepam) and close monitoring for at least 24 hours is recommended after an alcohol withdrawal seizure.	A	Ia
5.42 Anticonvulsants are not effective in preventing further seizures in the withdrawal episode.	A	Ia

Role of long-term anticonvulsants for patients with alcohol withdrawal seizures

Patients should not be initiated on long-term anticonvulsants unless there are other causes of seizure activity. Alcohol withdrawal seizures will not recur if the patient remains abstinent, and most patients have very poor adherence with anticonvulsants if they recommence alcohol use, and indeed may even increase the risk of seizures due to erratic anticonvulsant use.

Recommendation	Strength of recommendation	Level of evidence
5.43 Long-term anticonvulsant treatment is not recommended to prevent further alcohol withdrawal seizures..	D	IV

Hallucinations

Patients may experience hallucinations or other perceptual disturbances (such as misperceptions) at any stage of the alcohol withdrawal phase.

Clinical presentation

Hallucinations may be visual, tactile or auditory. Tactile perceptual changes include pins and needles, itching, burning, numbness, crawling sensations and 'electric fleas'.

Hallucinations may be accompanied by paranoid ideation or delusions, and abnormal affect (agitation, anxiety, dysphoria).

Hallucinations during withdrawal are a symptom that generally warrants admission into an appropriate facility (such as psychiatric or specialist detoxification unit) that can safely manage the patient.

Assessment and monitoring

Thorough psychiatric evaluation is required in order to exclude concomitant medical or psychiatric conditions. Importantly, withdrawal-related hallucinations occur as one of many features of alcohol withdrawal syndrome, and other causes should be considered if the presentation is not consistent with alcohol withdrawal (see 'Alcoholic hallucinosis' below). Where withdrawal-related hallucinations can be established, the following management plan is recommended:

- frequent monitoring (including physical parameters, withdrawal severity) and supervision is required to ensure safety of the patient from harm to self or others
- ensure adequate hydration through oral fluids (and intravenously if necessary)
- patient should be managed in a quiet room with minimal sensory stimulation (see 'Supportive care' above)

Medication

Ensure adequate diazepam doses (at least 60 to 80 mg per day) until alcohol withdrawal features are alleviated.

Antipsychotic medications should be used as an adjunct to adequate benzodiazepine doses if the patient is agitated or distressed by their hallucinations, or disruptive to others. No controlled trials have demonstrated the superiority of different antipsychotic medications; practitioners should use medications with which they are most familiar. Examples of regimens include:

- haloperidol 2.5 to 10 mg oral or intramuscular, repeated as required
- olanzapine 5 to 10 mg oral or buccal dose, repeated to 30 mg daily dose as required
- risperidone 1 to 5 mg, oral or intramuscular, twice daily, repeated as required.

Antipsychotic medication should not be used in isolation (that is, without adequate benzodiazepine loading) as they do not adequately prevent the onset of alcohol withdrawal delirium and may lower seizure threshold.

Alcoholic hallucinosis

Chronic alcohol use can result in an organic psychotic disorder, most commonly with hallucinatory features (alcoholic hallucinosis), that can be difficult to differentiate from other causes of psychosis. Hallucinosis occurs in about 25 per cent of hospitalised patients who have been drinking heavily for at least 10 years.

Unlike alcohol withdrawal delirium, the patient will have a clear sensorium during alcoholic hallucinosis; but typically they will experience auditory hallucinations (also possibly visual hallucinations or misperceptions) and persecutory delusions while they are drinking. Such hallucinations may persist during withdrawal and can be mistaken for alcohol withdrawal hallucinations.

Treatment with antipsychotic medications is recommended if the symptoms are distressing until long-term abstinence is achieved and symptoms ameliorate. The prognosis in these patients is usually good if long-term abstinence is maintained, although a minority (10–20%) will develop a chronic schizophrenia-like syndrome.

Alcohol withdrawal delirium

Alcohol withdrawal delirium is also referred to as delirium tremens or DTs and the terms can be used interchangeably.

Clinical presentation and prevalence

The features of alcohol withdrawal delirium are disturbance of consciousness and changes in cognition or perceptual disturbance (see Table 5.7). A number of medical conditions, including metabolic, infectious, toxic and traumatic causes, may cause delirium.

Table 5.7: DSM-IV-TR diagnostic criteria for substance withdrawal delirium

A	Disturbance of consciousness (that is, reduced clarity of awareness of the environment) with reduced ability to focus, sustain or shift attention
B	A change in cognition (such as memory deficit, disorientation, language disturbance) or the development of a perceptual disturbance that is not better accounted for by a preexisting, established or evolving dementia
C	The disturbance develops over a short period of time (usually hours to days) and tends to fluctuate during the course of the day
D	There is evidence from the history, physical examination or laboratory findings that the symptoms in Criteria A and B developed during, or shortly after a withdrawal syndrome.

Source: American Psychiatric Association 2000, *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, text revised, American Psychiatric Association.

Alcohol withdrawal delirium typically commences 2 to 3 days after drinking, and usually lasts for a further 2 to 3 days, although in severe cases can persist for several weeks.

The incidence of alcohol withdrawal delirium in placebo-treated alcohol dependent patients entered into inpatient clinical trials averages 5 per cent, although with effective treatment the incidence is much lower. Early studies reported mortality rates as high as 15 per cent; however, the rate has fallen with advances in management to less than 1 per cent.

Accompanying clinical features often include autonomic hyperactivity, such as hyperpyrexia, tachycardia, hypertension and diaphoresis.

Concomitant medical conditions are common and may not be obvious or self-reported. These may include dehydration, electrolyte abnormalities, renal failure, unrecognised head trauma, infections (including meningitis), gastrointestinal haemorrhage, pancreatitis and liver failure.

Management

The initial treatment goal in patients with alcohol withdrawal delirium is control of agitation. Rapid control of agitation reduces the incidence of subsequent adverse events.

Monitoring and assessment

Thorough medical evaluation is required in order to identify complications of alcohol withdrawal delirium (such as electrolyte disturbances) and concomitant medical conditions.

Close monitoring and supervision (preferably one-to-one) may be needed to ensure safety of the patient from harm to self or others.

Vital signs (including pulse, blood pressure, temperature) should be monitored frequently.

Patient should be managed in a quiet room with minimal sensory stimulation. Good lighting and environmental cues (such as a clock and/or calendar) may reduce disorientation.

Recommendation	Strength of recommendation	Level of evidence
5.44 Alcohol withdrawal delirium requires hospitalisation, medical assessment, and close monitoring.	A	I
5.45 Patient should be managed in a quiet environment with minimal sensory stimulation.	C	III

Intravenous fluids and nutritional supplements

Dehydration should be corrected through intravenous hydration.

Electrolyte abnormalities should be corrected. In particular, hypomagnesaemia is often reported in patients with alcohol withdrawal delirium, and magnesium administration may help reduce neuromuscular activity and agitation.

Monitoring of fluid input and output may be required.

Parenteral thiamine should be administered (at least 300 mg thiamine daily, intravenously or intramuscularly), given before any intravenous glucose is administered (intravenous glucose may precipitate acute thiamine deficiency; see 'Wernicke–Korsakoff's syndrome' below).

Recommendation	Strength of recommendation	Level of evidence
5.46 Dehydration and electrolyte imbalance should be corrected.	S	–

Medication

Benzodiazepines, having fewer complications than neuroleptics, are recommended as the primary medication in managing alcohol withdrawal delirium, reducing mortality, and duration of delirium. Controlled studies about the most effective benzodiazepine or route of administration are lacking; however, the following points should guide treatment:

- Rapidly acting benzodiazepines should be used. Oral diazepam acts rapidly (within 1 hour) and is easy to administer in most treatment settings. Intravenous diazepam can also be used where agitation must be quickly controlled, without the need for an intravenous infusion (which is usually needed if using short-acting benzodiazepines such as midazolam).
- Long-acting benzodiazepines (such as diazepam) provide long duration of symptom relief with minimal breakthrough symptoms. Short-acting benzodiazepines require an intravenous infusion, and should only be used in hospital settings with the capacity for close monitoring (such as ICU, high dependency unit).
- Short-acting benzodiazepines (such as midazolam, lorazepam, oxazepam) should be used where clinicians are concerned about prolonged sedation, such as in the elderly, recent head injury, liver failure, or other serious medical illness.

From the above, it is recommended that:

- The aim of medication is to achieve and maintain light sedation (somnia) in which the patient is awake but tends to fall asleep unless stimulated, or is asleep and is easily roused.
- Doses and regimens must be individually titrated for each patient, as there is considerable variation in medication needs.
- Benzodiazepines are the first line of treatment
 - Oral diazepam 20 mg hourly until somnolence. Doses in excess of 80 mg are typically needed. Once sedated, follow-up doses of 20 mg 6 hourly should be continued until delirium has abated.
 - Intravenous diazepam should be used if the patient is unable to take oral medications, or more rapid sedation is needed. Doses should be administered every 5 to 10 minutes until light sedation is achieved. Initial doses of 5 mg diazepam, increasing to 10 mg doses if adequate sedation is not achieved. Once sedated, patient can resume oral medications or continue intravenous diazepam 5 to 10 mg 1 to 2 hourly as required.
 - Intravenous midazolam (for example, 2 to 5 mg) should be used if the clinician is concerned about over-sedation from loading with diazepam in patients who are elderly and/or have severe medical illness, recent head injury or liver failure. Midazolam is short acting, and requires intravenous infusion under closely monitored settings (such as ICU, high dependency unit).
- Antipsychotic medications should be used as second-line medication in controlling agitation of alcohol withdrawal, as an adjunct to (not instead of) adequate benzodiazepine doses. Controlled trials demonstrating the superiority of different antipsychotic medications are lacking; practitioners should use medications with which they are most familiar. The newer antipsychotic agents (such as risperidone, olanzapine, quetiapine) have a better safety profile. Examples of regimens include:
 - haloperidol 2.5 to 10 mg oral or intramuscular, repeated as needed
 - olanzapine 5 to 10 mg oral, buccal or intramuscular dose, repeated as needed
 - risperidone 1 to 5 mg, oral or intramuscular, twice daily, repeated as needed.

Recommendation	Strength of recommendation	Level of evidence
5.47 Benzodiazepines should be used to achieve light sedation. Oral diazepam or lorazepam loading until desired effect is the treatment of choice. Intravenous diazepam or midazolam is appropriate if rapid sedation is needed.	A	Ia
5.48 Antipsychotic medications should be used to control agitation of alcohol withdrawal as an adjunct to (not instead of) adequate benzodiazepine doses.	A	Ia

Wernicke–Korsakoff’s syndrome

Wernicke’s encephalopathy is a form of acute brain injury resulting from a lack of thiamine (vitamin B1) that most commonly occurs in chronically alcohol dependent people. In alcohol dependent patients thiamine deficiency occurs due to poor dietary intake and/or intestinal malabsorption. It is estimated that healthy subjects absorb 4.5 per cent of an oral dose of thiamine, compared to only 1.5 per cent in alcohol-dependent subjects.

Wernicke’s encephalopathy is not a withdrawal complication but it is usually identified in acute hospital presentations, including patients presenting with alcohol withdrawal. It can co-exist with and should be distinguished from acute alcohol withdrawal, hepatic encephalopathy, and other causes of confusion.

Wernicke’s encephalopathy is initially reversible, but if untreated or inadequately treated can lead to Korsakoff’s syndrome, a chronic and disabling condition characterised by severe short-term memory loss and impaired ability to acquire new information that often presents with compensatory lying or invention. Korsakoff’s syndrome is not dementia or delirium.

Approximately one-quarter of patients with Wernicke’s encephalopathy recover completely if treated appropriately, one-quarter show significant improvement, one-quarter only partially recover, and one-quarter show no improvement over time. Approximately one-quarter requires long-term institutional care. It is imperative that treatment is initiated early as delays in treatment may worsen the patient’s prognosis. No effective treatment of Korsakoff’s syndrome has been found.

Clinical presentation and diagnosis

The classic triad of Wernicke’s encephalopathy is:

- confusion or mental impairment (estimated to occur in 80% of cases)
- ataxia (approximately 20% to 25% of cases)
- eye signs such as nystagmus or ophthalmoplegia (approximately 30% of cases).

Only a minority of patients with Wernicke’s encephalopathy (estimated at 10%) exhibits all three signs. In rare cases, untreated Wernicke’s encephalopathy may result in hypothermia, hypotension, coma and death.

Wernicke’s encephalopathy is grossly under-diagnosed:

- Post-mortem studies reveal Wernicke’s encephalopathy in 12.5 per cent of heavy drinkers (compared to 1.5% of the general population), and fewer than 80 per cent are diagnosed before post-mortem.
- Clinical features of Wernicke’s encephalopathy may be misinterpreted as intoxication, withdrawal, head injury, or other causes of confusion in heavy drinkers.

- While there are no specific routine diagnostic tests for Wernicke's encephalopathy, MRI can usually detect symmetric alterations in the mamillary bodies, medial thalami, tectal plate, and the periaqueductal gray area in the brain. In patients with a history of alcohol abuse, contrast media can identify mamillary body lesions typical for Wernicke's encephalopathy, even in the presence of normal unenhanced MRI.

Diagnosis of Wernicke's encephalopathy requires a high index of suspicion in heavy or chronic drinkers, especially if there are any clinical features (such as memory impairment) consistent with Wernicke's encephalopathy or Korsakoff's syndrome.

Patients with suspected Wernicke's encephalopathy or Korsakoff's syndrome should be assessed for other forms of alcohol-related brain injury, such as dementia.

Recommendation	Strength of recommendation	Level of evidence
5.49 Clinicians should consider MR contrast neuro-imaging where the diagnosis of Wernicke's encephalopathy is not clinically established.	D	III

Preventing and treating Wernicke's encephalopathy

All heavy or chronic drinkers should be considered at risk of developing Wernicke's encephalopathy. Given that so many patients with Wernicke's encephalopathy are undiagnosed and thiamine is safe and costs little, all patients undergoing alcohol withdrawal should be treated with thiamine to prevent Wernicke's encephalopathy. And given the major clinical repercussions of not treating Wernicke's encephalopathy, all patients with any features of Wernicke's encephalopathy should be treated as though Wernicke's encephalopathy is established.

Prophylaxis

In patients showing no clinical features of Wernicke's encephalopathy or memory impairment, thiamine is recommended as a prophylactic measure.

- As well-controlled trials have provided limited evidence to guide therapy, significant uncertainty exists about the required dose and duration of therapy. Clinicians agree, however, that it is important to recommend high doses of thiamine to ensure enough is being given to prevent serious neurological disease.
- Healthy patients with good dietary intake may be administered oral thiamine 300 mg per day (for example, 100 mg three times daily) for 3 to 5 days, and maintained on 100 mg oral thiamine for a further 4 to 9 days (total of 1 to 2 weeks of oral thiamine).
- Chronic drinkers with poor dietary intake and general poor nutritional state should be administered parenteral thiamine doses (due to poor intestinal absorption of oral thiamine supplements). The recommended dose of thiamine 300 mg intramuscularly or intravenously per day for 3 to 5 days, and subsequent oral thiamine doses of 300 mg per day for several weeks.
- Alcohol is associated with coagulopathy that may render intramuscular injection unsafe.
- Thiamine should be given **before** any carbohydrate load (such as intravenous glucose) as carbohydrates can cause rapid utilisation of thiamine and precipitate Wernicke's encephalopathy.
- Correct any electrolyte disturbances, including hypomagnesaemia.

Treatment

It is imperative that treatment is initiated early as delays in treatment may worsen the patient's prognosis. All heavy drinkers displaying any features of Wernicke's encephalopathy (such as confusion, ataxia, eye signs, coma, memory impairment, hypothermia with hypotension, or delirium tremens) should be treated as though Wernicke's encephalopathy is established (even if intoxicated).

- Thiamine should be given **before** any carbohydrate load (for example, intravenous glucose).
- Parenteral doses of at least 500 mg per day thiamine (intramuscular or intravenous diluted in saline over 30 minutes) should be administered daily for at least 3 to 5 days, and subsequent doses of at least 300 mg (oral or parenteral) per day for 1 to 2 weeks. The intramuscular route should not be used for patients with coagulopathy.
- Correct any electrolyte disturbances, including hypomagnesaemia

Recommendation	Strength of recommendation	Level of evidence
5.50 All patients exhibiting any features of Wernicke's encephalopathy should be treated as though Wernicke's encephalopathy is established.	D	III
5.51 All patients suspected of Wernicke's encephalopathy should be treated with high-dose parenteral thiamine (at least 500 mg daily) for at least 3 to 5 days. The intramuscular route should not be used for patients with coagulopathy. Subsequent oral thiamine doses of 300 mg per day for several weeks.	D	III
5.52 Patients suspected of Wernicke's encephalopathy should have hypomagnesaemia corrected in order for thiamine supplements to be effective.	D	III

Long-term thiamine use in persistent drinkers

Oral thiamine (for example, 100 mg daily) should be maintained until long-term abstinence has been achieved. Persistent drinkers should be maintained on oral thiamine supplements.