Treatment approaches and integrated care for alcohol and drug use

Introduction

People use substances such as alcohol, prescribed drugs and illicit drugs for a variety of reasons. These include enjoyment, relief of emotional distress or physical pain, sleep, performance enhancement, curiosity and spirituality. Substance use occurs on a spectrum, which spans from no use to low-risk, hazardous, harmful, and dependent use (Figure 1). People can move back and forth along the spectrum and be exposed to a range of harms associated with different types and patterns of alcohol and other drug (AOD) use. The term 'harms' refers to harmful impacts of AOD use to physical, social, emotional and financial wellbeing of self and others.

When a person continues to use a substance despite harms to themself or others, it is called a ***substance use disorder***. This can range from mild through to severe. At the more severe end of the spectrum, ***dependent use*** occurs where the person may lose control over their use, and prioritise substance use over other activities. They may have unpleasant withdrawal symptoms if their use decreases or stops.

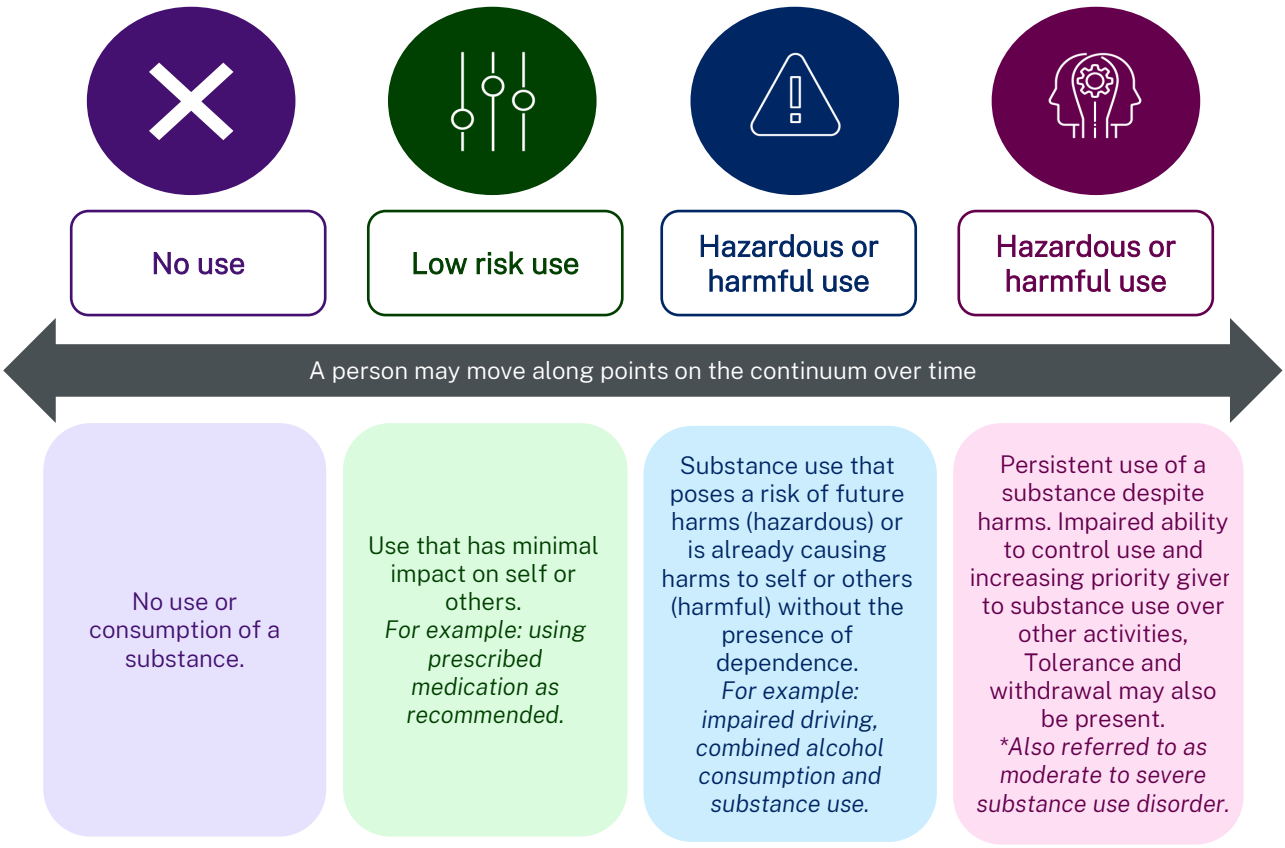

Figure 1: Substance use continuum[1–4]

At each point on the continuum, health responses offer benefits. The overarching focus of any intervention is to minimise the harms linked to AOD use.

Substance use disorders and related harms are treated in a variety of settings by multidisciplinary providers, often with a combination of AOD treatment or care modalities delivered concurrently. People who have substance use disorders, including dependence, often experience comorbid conditions, including mental health conditions[5] and physical illnesses.[6] This is reason why individuals with substance use disorders often present to generalist health services (e.g. general practitioners and emergency departments). There is no 'one size fits all' approach to managing the health and wellbeing of people with substance use disorders. Each person's experience of AOD treatment and care varies based on their mental and physical health needs, the type of substance/s used, presence or level of dependence, and their capacity and resources to manage substance use and their associated harms.

Stigma and discrimination can be distressing and are barriers to seeking care. People who use AOD may not disclose their use or may not seek care due to fear of discrimination. This can result in later entry or early departure from treatment, worse experiences of treatment, and worse health outcomes.[7] All treatment should be informed by the following principles:

- **Person-centred care:** respectful and culturally appropriate care that is responsive to the preferences, needs and values of a person.
- **Holistic care:** taking a holistic approach to addressing the variety of needs someone may present with, including physical, psychological, social, employment, housing, criminal justice, family and relationship needs to ensure positive and sustainable outcomes. Peer workers can be employed as part of a multidisciplinary team to support holistic care.
- **Trauma-informed care**: care that adopts a holistic perspective of a person's health needs in the context of life experiences and the complex intersections that may occur between violence, abuse and neglect, and AOD use. The impacts are often cumulative and long lasting, and can be exacerbated by experiences of discrimination, stigma and shame. Trauma-informed care should be delivered in an environment that is psychologically safe, respectful of diversity and empowers people through collaboration and choice.[8,9]

Overview of treatments for substance use disorders

A range of evidence-informed treatment approaches are available and delivered across public, non-government and primary care settings. These include general approaches and more targeted approaches for specific substances or populations (Table 1).

Evidence suggests treatment is optimised when individuals participate in shared decision-making and are able to define their own treatment goals (e.g. abstinence, reduction in consumption frequency or amount consumed, approaches to reduce harms, increased ability to function and experience higher quality in identified areas of life).[10,11]

Table 1: Overview of treatment for substance use (hazardous and harmful use, and dependence)	
General treatment types	
Early and brief interventions	Designed for people who use AOD in ways that pose a risk to health and wellbeing but are not yet dependent or experiencing a disorder. Using an interactive approach, these are brief structured conversations about substance use to prompt or assist behaviour change and reduce AOD-related harm. They may include listening, individualised advice, agreeing on a goal and practical steps to work towards that goal. They can be provided by a range of professionals including in primary care, outpatient specialist AOD treatment services, hospitals, or through online, telephone and virtual support services.
Psychosocial interventions [8]	Psychosocial interventions often involve 'talking-based' treatment aimed at supporting people to understand their own or others' use of AOD, and to make changes for better health and wellbeing. The more commonly used interventions include: • **Acceptance and commitment therapy (ACT):** Involves managing the desire to avoid painful thoughts, memories and sensations to feel more comfortable with them, and to increase capacity for positive change. • **Cognitive behavioural therapy (CBT):** Structured approach to identifying and challenging unhelpful beliefs that maintain problematic patterns of thought and behaviour, and work towards adaptive beliefs and behaviour. • **Contingency management:** Positive reinforcement of healthy behaviours that individuals wish to continue in the future (e.g. vouchers or incentives to encourage maintenance of treatment goals, whether they be abstinence, medication compliance or attendance at treatment sessions). This is most commonly contingent upon proof of abstinence (e.g. negative urine samples on substance testing). Contingency management is more commonly used in some overseas settings than in Australia. • **Dialectical behavioural therapy (DBT):** DBT emerged from CBT and teaches skills related to emotional regulation, impulsivity, distress tolerance, and mindfulness.[12] • **Family-based therapy:** An approach which views people in the context of their relationships with key people in their lives. The term 'family' is inclusive of all support people, significant others and communities. Treatment focuses on interactions of everyone in the family unit, with everyone playing an active role in treatment. • **Mindfulness-based interventions:** Mindfulness is a meditative practice which involves intentionally focusing attention on a range of physical, emotional and cognitive experiences. • **Motivational interviewing (MI) and motivational enhancement therapy (MET):** Collaborative, goal-oriented communication style to promote engagement and build motivation for behaviour change. This may include building motivation for treatment adherence.

Table 1: Overview of treatment for substance use (hazardous and harmful use, and dependence)	

	• **Mutual help (e.g. SMART recovery, 12-step recovery):** Mutual aid interactive support and recovery groups.
	  ○ SMART recovery is grounded in CBT to address behaviours around substance use.[13] Groups have a trained facilitator.
	  ○ 12 Step recovery originated from Alcoholics Anonymous[14] and was later used in other substance recovery groups such as Narcotics Anonymous.[15] Involves acknowledgement of addiction and accepting surrender to a "higher power" such as God, the community or nature.
	• **Peer support:** peer support workers are people with lived experience of substance use who draw on their experience to support individuals with substance use disorders.
	• **Supportive counselling:** Often delivered face-to-face in individual or group sessions. Suitable for people who have a relatively stable living situation and who wish to be able to maintain daily routines and commitments.

Withdrawal management (also known as 'detox')	Designed for people who have a physical dependence on a substance. Physical dependence causes a range of unpleasant symptoms classified as 'withdrawal syndrome', when decreasing or stopping use of a substance. Withdrawal can be managed through medical and psychological care. Severe withdrawal from some substances can be life threatening (e.g. alcohol, benzodiazepines and gamma-hydroxybutyrate [GHB]). Withdrawal management can occur in an inpatient or community setting (including face-to-face and virtual), depending on the predicted or actual severity, and may require medication.
Day rehabilitation programs	Programs that provide structured non-residential education, support and counselling for people who are dependent on substances. People continue living at home and attend day programs for set durations and at set times.
Residential rehabilitation programs	Programs which provide care and support for people in a supervised, residential setting. This type of treatment is suitable for people with more severe dependence who would benefit from separation from their everyday environments. Residential rehabilitation programs vary in length (e.g. from 4 weeks to 12 months) and include a range of care types (e.g. individual and group counselling, and education or skills training). Mutual support groups are often available. In a therapeutic community model, the community of individuals within the service itself plays an important role in change.
Targeted programs	
Opioid treatment programs	People with opioid dependence may receive opioid substitution treatment (buprenorphine, buprenorphine-naloxone, methadone) as part of the Opioid Treatment Program (OTP). Opioid substitution medication may be provided alongside other treatments such as counselling and rehabilitation. The OTP is available through public clinics and general practice. The medication is commonly provided and administered at pharmacies.[13]
Involuntary drug and alcohol treatment	Involuntary care is sometimes legally mandated for people with severe substance dependence. In NSW, involuntary drug and alcohol treatment provides short term care in a specialised inpatient unit. Such treatment can legally only be used to protect a person's health and safety if they have already experienced, or are at risk of experiencing, serious harm and their decision-making capacity is compromised due to substance use. An order for involuntary care is only available if no less restrictive form of care is feasible. The program provides withdrawal management and post-withdrawal assessment and treatment.
Assertive case management	An intensive, community-based program that follows a chronic disease management model; characterised by assertive engagement and support delivered by multidisciplinary teams with small protected caseloads, and rapid access to services at low thresholds.[16]

Table 1: Overview of treatment for substance use (hazardous and harmful use, and dependence)	
	This approach is used to help people with severe substance dependence and complex needs.[17]

Overview of medicines for substance use disorders

Table 2 gives an overview of medicines that are currently used, or are being researched, for the management of substance use disorders and are discussed in this report.

Table 2: Summary of medicines for substance use disorders[18]		
Medication	Description	
Alcohol use disorder – established medicines for relapse prevention		
Acamprosate	Acts on receptors in the brain to reduce cravings for alcohol in people with alcohol dependence. Helps maintain abstinence.	
Naltrexone	Naltrexone acts on the brain's opioid receptors to reduce cravings and some of the pleasurable effects of alcohol.	
Disulfiram	Disulfiram interferes with alcohol metabolism and leads to build up of acetaldehyde, the chemical compound which causes the unpleasant side effects of alcohol such as nausea and vomiting. These expected effects act as a deterrent to alcohol consumption when disulfiram is taken. Serious effects can occur if alcohol and disulfiram are simultaneously consumed.	
Alcohol use disorder – medicines sometimes used		
Baclofen	Baclofen is used to treat muscle spasm. It works on a similar receptor in the brain as alcohol. Baclofen may reduce cravings for alcohol.	
Topiramate	Topiramate has multiple actions in the brain and is used as an anti-seizure medication. It also reduces dopamine release in the brain, reducing the reward of alcohol consumption.	
Alcohol use disorder – medicines being researched		
Several other medications are being studied for potential effectiveness in treating alcohol dependence. These include N-acetylcysteine (NAC),[19,20] glucagon-like peptide-1 (GLP-1) agonists,[21,22] and 3,4-methylenedioxymethamphetamine (MDMA) as treatment for comorbid alcohol dependence and post-traumatic stress disorder.[19,20]		
Cannabis use disorder – medicines being researched		
N-acetylcysteine (NAC)	N-acetylcysteine is thought to correct glutamate levels in the part of the brain involved in motivation and learning which may be effective in reducing cravings to use cannabis.[23]	Not available for routine use for cannabis use disorders in Australia. Have been used in clinical trials.
Nabiximols	A mix of two cannabinoids: delta-9-tetrahydrocannabinol (delta-9 THC) and cannabidiol (extracts of *Cannabis sativa* leaf and flower). Approved for use in Australia to manage spasticity in multiple sclerosis.[24] Nabiximols have shown some positive results in reducing symptoms of cannabis withdrawal, and retention in treatment of cannabis use disorders.[25,26]20/11/2024 17:16:00	
Stimulant use disorder – medicines being researched		
Dexamphetamine	A stimulant medication used in the treatment of ADHD. Currently prescribed as part of clinical trials to assess effectiveness in reducing	Not available for routine use for

	cravings and substance use in people who are dependent on stimulants (e.g. amphetamines, cocaine).[27] Dexamphetamine is short-acting. A long-acting form (lisdexamfetamine) is also being trialled.[28]	stimulant use disorders in Australia. Have been used in clinical trials.
Methylphenidate	A non-amphetamine stimulant medication used in the treatment of ADHD.	
Modafinil	A non-amphetamine stimulant whose exact mechanism of action is unknown.	
Bupropion	Bupropion has multiple actions in the brain and has been used as an antidepressant medication. It is also registered for use in Australia to treat nicotine dependence.	
Mirtazapine	Registered and prescribed in Australia for treatment of depression.	
Opioid use disorder – established medicines		
Buprenorphine	Buprenorphine partially activates opioid receptors in the brain ('partial agonist'). It 'sticks' tightly to the receptors, making it harder for other opioids, like heroin, to have an effect. In the formulations taken by mouth, buprenorphine is available in a combination medication with naloxone to discourage diversion and/or intravenous injection. Naloxone has limited effect when taken orally, but if the combination medication is injected, the effects of buprenorphine are reduced. Long-acting injectable buprenorphine can be given weekly or monthly. A health practitioner injects the medication into the fatty tissue under the skin (subcutaneously).	Opioid substitution treatment
Methadone	Acts on opioid receptors (a 'full agonist', like morphine) but can be taken once per day by mouth. It supports people to reduce or cease illicit or other opioid use by suppressing withdrawal symptoms and reducing cravings.	
Naloxone	An opioid antagonist which reverses opioid overdoses by blocking opioid receptors and preventing opioids from activating the receptors (or causing an effect). If someone has not experienced an opioid overdose, naloxone administration will not cause harm. In the community, naloxone is generally given as a nasal spray or intramuscular injection for opioid overdose reversal.	Opioid overdose reversal
Opioid use disorder (OUD) - medicines used overseas and in clinical trials		
Injectable hydromorphone/ diacetylmorphine (heroin)	An injectable form of opioid agonist treatment which is used in some overseas settings to manage severe opioid use disorder which does not respond to alternative opioid substitution treatments. Being researched in clinical trials.	
Sustained release oral morphine	Slow-release oral morphine (an opioid agonist) which is used in some overseas opioid substitution treatment programs to reduce cravings for opioids.	
Naltrexone	Naltrexone is an opioid antagonist which binds to opioid receptors, blocking the effects of opioid use. However, research shows that it is difficult for people to adhere to daily oral naltrexone, and risk of overdose can increase when it is stopped. A long-acting injectable form of naltrexone is used overseas for OUD, and a long-acting form of naltrexone has been marketed privately in Australia. Evidence for effectiveness remains limited.[29]	

Treatment effectiveness in substance use disorders

Treatments for alcohol use disorder

A stepped care[1] approach is used to match intensity of treatment and care to the severity of alcohol dependence or alcohol use disorder (AUD).

Withdrawal management: The management of withdrawal symptoms is also sometimes referred to as ***'detoxification'*** (or 'detox'). Alcohol withdrawal often requires medical management, particularly moderate to severe alcohol withdrawal which can be life-threatening. Withdrawal management can occur in a range of settings including at home, or as an inpatient in hospital or other specialised withdrawal management units.

Withdrawal management is an important access point to ongoing care, with research showing people who receive treatment soon after 'detox' are less likely to relapse.[30,31]

Residential rehabilitation: Residential rehabilitation services operate a variety of models and are typically for people with more severe substance use disorders with complex care needs. They are typically flexible and administered according to the needs of the person. They differ in treatment length, care pathways, format and content of programs, and psychosocial interventions delivered. Residential services are delivered to a nationally consistent set of quality service principles outlined in the *National Quality Framework for Drug and Alcohol Treatment Services 2018*[32] and the *National Framework for Alcohol, Tobacco and Other Drug Treatment 2019-2029.*[33]

Research supports residential care being as good as other modes of care (e.g. intensive outpatient day treatment).[34] For people with more severe alcohol problems and impaired cognition, residential care may be better than other modes of care in maintaining abstinence, reducing drinking, and reducing incarceration.[35,36] Research suggests residential rehabilitation is more successful in reducing relapse when it is of longer duration, integrates mental health treatment and involves ongoing community-based treatment after discharge. However, evidence is limited by low numbers of participants enrolled in follow up studies.[31,37]

Psychosocial interventions: Psychosocial interventions vary by type and intensity. A range of structured psychosocial treatments have demonstrated effectiveness.[38]

Cognitive behavioural therapy (CBT) alone is better than nonspecific therapy (such as supportive care), however, CBT is no more effective than other specific therapies (including 12 Step program and contingency management) in meta-analyses.[39,40]

Intensive approaches combining multiple treatment modes appear to be superior in AUD management. A 2023 network meta-analysis looked at 11 psychosocial interventions from 16 randomised studies of people with hazardous or harmful alcohol consumption, and people with alcohol dependence.[41] It found multiple sessions of motivational interviewing and CBT were more effective than multiple sessions of motivational interviewing alone in improving alcohol use

[1] Stepped care: where less intensive treatment is used first, then stepped up to more intensive treatment if the less intensive form is insufficient.

disorders identification test (AUDIT) scores. It also found that in-person delivery was more effective than telehealth.[41]

This network meta-analysis also found ***brief interventions*** were not superior to usual care in reducing AUDIT scores in people with hazardous or harmful alcohol use, or people with alcohol dependence; regardless of if they were delivered once or multiple times, or in-person or via telehealth.[41] In contrast, another systematic review found brief interventions are better than minimal or no intervention in reducing alcohol consumption in people with hazardous or harmful alcohol use.[42]

A 2022 systematic review looking at ***contingency management*** for AUD found mixed evidence tending towards favourable outcomes for treatment retention, longest continuous abstinence and reduced heavy drinking.[43]

A 2020 systematic review looking at the effectiveness of ***Alcoholics Anonymous (AA)*** and ***other 12 Step Programs*** for people with alcohol dependence found that manualised AA/12 Step Facilitation interventions led to higher rates of continued abstinence up to 3 years, in comparison to minimal treatment, network support (building new social networks supportive of sobriety), motivational interviewing, case management or CBT. This may also reflect ongoing AA participation after completion of a 12 Step intervention.[44]

Pharmacotherapies: Pharmacotherapy is used as part of a comprehensive treatment program which also includes psychosocial support.

- ***First line:*** Acamprosate and naltrexone together, and separately, have been shown to be more effective than placebo in reducing relapse and assisting maintaining abstinence.[45] Disulfiram is also registered for the treatment of AUD. Research shows it is better than placebo in achieving abstinence, particularly in supported and supervised environments.[46]
- ***Second line:*** Baclofen has been shown to reduce relapse rates in meta-analyses.[47,48] A recent meta-analysis found topiramate reduces alcohol consumption.[48]
- ***Other pharmacotherapies:***
    - Other medicines such as amisulpride, trazodone, varenicline, tiagabine and oxazepam have not been shown to be effective in the management of AUD[49] and are not currently recommended for AUD treatment.[16]
    - N-acetylcysteine (NAC) and 3,4-methylenedioxymethamphetamine (MDMA) continue to be researched.[19,20,23]
    - There is emerging evidence that semaglutide (a glucagon-like peptide [GLP-1] agonist) may be associated with reduced alcohol consumption in people using it for other medical reasons (usually to treat diabetes).[50] This uncovers a potential role for semaglutide in managing AUD, but more research is required.

Other therapies:

- Transcranial magnetic stimulation has not been shown to be effective for AUD.[49]
- While exercise does not appear to reduce alcohol consumption, exercise improves other health outcomes such as physical fitness.[51]

Treatments for cannabis use disorder

Background: Of people who use cannabis, approximately 9-30% may develop cannabis use disorder (CUD).[52]

Psychosocial interventions: When compared to no treatment, systematic reviews demonstrate strong evidence that psychosocial treatments reduce quantity and frequency of cannabis use and severity of dependence symptoms. Some research indicates that psychosocial treatments over longer intervals (i.e. 4 or more sessions) offer better outcomes. [53,54]

Cognitive behavioural therapy (CBT) focuses on skills development (e.g. emotional management, problem solving), cessation and reduction skills (e.g. analysis of use and consequences), and relapse prevention skills (e.g. refusal skills). CBT is often offered for between 6 to 14 sessions.

Motivational enhancement therapy (MET) aims to improve a patient's motivation and commitment to quitting or reducing cannabis. For CUD, there are typically 1-4 sessions.[54]

In treatment for CUD, ***abstinence-contingency management (CM)***[55] offers a motivation (often a token monetary amount, $10-$20) for attending appointments and for having urine tests that show abstinence from cannabis.

CBT with CM has been shown to improve readiness to change among people who use cannabis.[56]

A meta-analysis of 45 adolescent outpatient treatment studies for CUD showed that CBT, MET, and family-based therapy were effective treatments for CUD, with family-based therapies having larger effects on substance use.[57]

A review of 55 randomised trials for adults with CUD, showed that at 9 months post treatment, the best outcomes were achieved when psychosocial approaches and CM approaches were combined. The triad combination of CBT, MET, and CM has been shown to be effective in reduction of quantity and frequency of use, but not often effective for abstinence.[53,58,59]

Pharmacotherapies: There are no widely accepted pharmaceutical treatments for CUD.

Naltrexone is an opioid antagonist which affects the body's endocannabinoid system. Evidence is very limited with one study finding that long-acting injectable naltrexone decreased the number of cannabis use days per week.[60]

A systematic review of n-acetylcysteine (NAC) looking at 8 randomised, placebo controlled clinical trials found that NAC was effective at reducing cravings in CUD and in promoting cannabis abstinence. However, there were mixed results among the studies for frequency of use, cessation, and withdrawal.[61] NAC showed positive results for adolescents with CUD in one trial but not for adults.[62]

One inpatient clinical trial of nabiximols has shown benefit in reduction of withdrawal symptoms though not an increase in abstinence compared with placebo.[26]

In a small trial, gabapentin reduced withdrawal symptoms, but evidence is limited.[53]

Treatments for stimulant use disorder

Background: Treatment for stimulant use disorder commonly involves treatment for amphetamine-type stimulant (ATS) use disorder, and cocaine use disorder.

Psychosocial interventions: Psychosocial interventions are the current standard of care for amphetamine-type stimulant use disorder and cocaine use disorder, however the strength of evidence varies by type of psychosocial interventions used, and outcomes measured.

A large network meta-analysis of 50 randomised studies where people with cocaine or amphetamine dependence were assigned to psychosocial intervention/s or treatment as usual (i.e., non-specific therapy including case management, or unstructured and non-manualised psychosocial intervention) found ***contingency management*** alone, or in combination with ***community reinforcement*** or ***cognitive behavioural therapy*** (CBT) was better in helping people achieve abstinence at the end of treatment than treatment as usual (TAU).[63] Approaches that were no better than TAU were meditation-based therapies, CBT alone, supportive-expressive psychodynamic therapy, 12 Step programs or non-contingent reward programs delivered alone, or in various combinations.[63] Contingency management alone or in combination with community reinforcement was superior to TAU in minimising people leaving treatment early. There was some evidence that CBT, community reinforcement and non-contingent rewards delivered alone resulted in higher retention at the end of treatment, compared with TAU approaches.[63]

Another systematic review of 10 studies[64] found ***Matrix Model treatment*** (multi-component treatment adopting elements of CBT, motivational interviewing, family and group therapy) was more effective than TAU,[65] and that combined motivational interviewing and CBT was more effective than acceptance and commitment therapy (ACT) in achieving abstinence in people who use methamphetamines.[66]

Pharmacotherapies: There are no widely accepted pharmaceutical treatments for stimulant use disorder.[67] To date, a number of trials have been underpowered (didn't have enough participants to be able to study the statistical significance of results) with high study dropout rates.[67] Some meta-analyses find that dexamphetamine and methylphenidate show potential in managing amphetamine-type stimulant use disorder,[67] while others find they have no significant effect on rates of abstinence or retention at the end of treatment.[68] However, other meta-analyses reanalysing existing evidence have found higher dose methylphenidate prescribed for longer periods (20 weeks or more) reduces cravings and substance use, and results in increased treatment retention in people with amphetamine-type stimulant use disorder.[69] More evidence is required to substantiate the potential effectiveness of bupropion, mirtazapine, naltrexone and topiramate in managing amphetamine-type stimulant use disorder.[67,68,70]

Studies also show that dexamphetamine has a stronger effect in achieving abstinence or reducing substance use in people with cocaine use disorder compared to people with amphetamine-type stimulant use disorder; and that higher doses of dexamphetamine (60mg or above daily) are more effective than lower doses.[27] Modafinil and methylphenidate were not found to be effective in managing people with cocaine use disorder.[27] The evidence for bupropion in people with cocaine use disorder was mixed with one meta-analysis showing it was better than placebo in achieving sustained cocaine abstinence[71] while another did not.[27] More evidence is required to substantiate the role of disulfiram in cocaine use disorder.[72]

Residential rehabilitation: The Australian Methamphetamine Treatment Evaluation Study (MATES) found that compared to people in community withdrawal management ('detoxification') programs

and community controls, individuals in residential rehabilitation were more likely to achieve sustained abstinence or larger reductions in methamphetamine use; and that longer rehabilitation periods lead to larger benefits.[73] Longer periods of inpatient rehabilitation are also associated with longer periods of abstinence in people with cocaine use disorder.[74]

Treatments for opioid use disorder

Background: Opioids include heroin, prescription opioid medications (such as morphine and oxycodone), and codeine. [75]

Pharmacotherapies: The standard first-line pharmacotherapy for opioid use disorder (OUD) is opioid agonist therapy (OAT). OAT has been available in NSW since 1970, and the Schedule of Pharmaceutical Benefits has covered dispensing and administration of OAT since 2023.[76] Pharmacotherapy may be a life-long treatment; alternatively, some people taper their use over months to years. Most daily forms of opioid substitution therapy, such as buprenorphine or methadone, which are taken by the mouth, are delivered at a supervised location, such as a hospital clinic or pharmacy. Sometimes take-away doses are supported to allow dosing at home.

Long-acting injectable ***buprenorphine*** (LAIB) requires monthly dosing once stabilised, which means it offers greater treatment flexibility. It has good acceptability among people with OUD.[77,78] LAIB is given as a subcutaneous injection (into the fatty tissue under the skin).

Subdermal implantable buprenorphine is available overseas and functions in a similar way to LAIB.

Like buprenorphine, ***methadone*** acts on opioid receptors (as an opioid agonist) and is taken once a day. By providing a controlled amount of daily methadone to individuals with OUD, individuals have significantly improved quality of life. For those on a stable dose, methadone can largely prevent withdrawals and reduce cravings. It also induces tolerance, so the individual feels limited effect from use of additional opioids.

There is strong evidence to support methadone treatment. Research has continually shown that daily methadone reduces heroin use, increases functioning in employment, family, legal and psychiatric domains, and decreases mortality. For pregnant women, studies show that opioid agonist treatment decreases opioid dependence in newborns, and methadone treatment has been shown to decrease HIV transmission.[79] Treatment with methadone is significantly more effective than nonpharmacological management in keeping people in treatment programs and in reducing heroin usage (as determined by urine drug testing).[80] Opioid treatment programs have been shown to reduce overdose in New South Wales.[81]

A systematic review suggested that extra (street) opioid use was lower in people receiving buprenorphine than methadone, along with reduced cocaine use and increased treatment satisfaction in buprenorphine users. [80,82]

Alternative pharmacotherapies include ***naltrexone*** which is an opioid antagonist and binds to opioid receptors, blocking the effects of opioid use. Oral naltrexone has low patient acceptance when used for treatment of OUDs, and when it is discontinued abruptly, there is increased risk of overdose with opioid use.[83]

Long-acting injectable extended-release naltrexone is used overseas for OUD, especially when OUD is accompanied by other substance use disorders.[84] In a meta-analysis, buprenorphine and methadone were shown to be more effective than naltrexone alone for OUD, and all three were more effective than no medication.[85]

Sustained-release oral morphine (SROM) is the most common treatment for OUD in Austria and has been used in Europe since the 1990s. Research in Switzerland and Germany has demonstrated that SROM is more effective than methadone in reducing self-reported cravings for heroin. It is not routinely used for treatment of opioid dependence in Australia.

Injectable hydromorphone or diacetylmorphine (heroin) are forms of injectable opioid agonist therapy (iOAT). Available in Canada and some Western European countries, this is a treatment for patients with severe and refractory (unable to be treated in other ways) OUD. A patient presents two or three times daily for witnessed self-administration of the iOAT, and a long-acting formulation (such as methadone or SROM) is given in the evening to provide a treatment effect overnight.[86]

Research shows that for patients who have refractory OUD, using injectable hydromorphone or diacetylmorphine results in reduction of illicit substance use, improved treatment retention, decrease in incarceration, and an improvement in quality of life compared to methadone. Injectable hydromorphone shows similar effects to diacetylmorphine in reduction in opioid use.[87,88]

Costs are higher for injectable diacetylmorphine (heroin) than for injectable methadone or oral methadone,[89] but some research has shown injectable diacetylmorphine was more effective and less costly than methadone for people with severe refractory OUD over 1, 5, and 10 year follow-up.[90]

Additional therapies being used for OUD in overseas settings with limited evidence include opium-tincture assisted therapy in place of methadone,[91] non-invasive brain stimulation,[92] and deep brain stimulation.[93]

Psychosocial interventions: In a meta-analysis of randomised control trials, ***CBT*** with methadone treatment was significantly more effective than methadone treatment alone for people with OUD, as measured by decreased opioid-positive urine tests.[94] Behavioural couples' therapy has also been shown to decrease the rates of people discontinuing methadone programs.[94]

Pain education management programs offering education on chronic pain management strategies may be beneficial for people with chronic pain who were first introduced to opioids via prescription ("iatrogenic dependence").[95]

Peer recovery support services are provided by people with lived experience of substance use. Some studies have shown effectiveness for engagement in treatment, reducing substance use and abstinence.[96]

Development of ***social networks*** and strengthening social ties has been shown to support people with OUD in their treatment goals.[97]

A review of ***digital interventions*** (including delivery of CBT, motivational interviewing, and brief intervention via a digital platform) found that 10 of 20 studies resulted in an impact on opioid abstinence, and 4 found benefit for treatment retention.[98]

Residential treatment settings ('inpatient rehab') vary in their capacity and willingness to accept individuals on opioid substitution treatments. This may be due to workforce capacity limitations in prescribing or dosing, or a philosophical objection to opioid substitution and preferring psychological and behavioural approaches.[99]

The ***'therapeutic community'*** is a type of residential treatment in which the community is seen as the primary agent of change. Therapeutic communities have traditionally seen opioid substitution therapy as incompatible with recovery, though this has changed in some communities.[100] Some

evidence from the Australian Treatment Outcome Study demonstrates benefit from 'therapeutic community' residential treatment.[101]

Treatment of opioid overdose: ***Naloxone*** is a short-acting opioid antagonist and can be given (via nasal spray or injection) to individuals where an opioid overdose is suspected. Naloxone works for any opioid, including new synthetic opioids (e.g. fentanyl, nitazenes). It is recommended that people with OUD, family members of people with OUD, and all potential first responders carry naloxone.[75] Sometimes multiple doses of naloxone and emergency department care are needed, particularly for an overdose involves a longer-acting or more potent opioid.

Monitoring health and social outcomes

To provide a complete picture of post-treatment effects and value, evaluations of treatments need to incorporate a range of short and long-term health and social impact and outcome measures. Research may also be performed by monitoring how well programs work in the real world, compared with controlled settings or selected patient groups, such as in clinical research trials. The ability to monitor and assess treatment and program effectiveness is determined by the quality, completeness and availability of data on relevant impacts and outcomes. To maximise the usefulness of the data available in NSW, further work is needed to achieve high quality point of care data collection, timely data linkage, routine analysis and interpretation of findings, and translation to inform policy implementation, program design and clinical practice.

Outcomes for AOD treatment can include frequency and quantity of substance use, mental health status, experience of treatment, social and employment participation, and quality of life.

Clinicians often collect information on short-term outcomes as part of AOD treatment review to guide treatment and assess how effective treatments are for an individual. When collated across patients and services, these measures can be used to evaluate program effectiveness and identify patterns in service design, setting and treatment responses.

Long-term outcomes of AOD treatment include health and social outcomes, as well as other health and social service use. These outcomes are important for understanding the sustained impact of treatments, for both individuals and communities. Understanding the accessibility, reach, impact and broader social outcomes from AOD treatment requires data from AOD services to be linked to data from outside AOD services. It also helps to identify who would likely benefit from treatment but is missing out, and how service and treatment gaps may be addressed.

As an example, patient data may be linked to data from other health or social services, including the criminal justice or education systems. Data linkage can be used in partnership with stakeholders such as frontline healthcare providers, government agencies, academics, policy makers, and people with lived or living experience of AOD to create a more complete understanding of AOD intervention effectiveness. In addition, data linkage helps identify areas for improvement.

Expanding linkages between existing linked datasets and expanding collaboration to establish new datasets will improve the quality of evidence on AOD treatment effectiveness. Work is underway to improve clinical outcome data collection in all NSW government funded AOD treatment services. This includes multiple strategies to build sector engagement and capacity to integrate the collection and utilisation of outcome and experience measures into clinical interactions, and to examine important co-morbidities such as mental health conditions.

Prenatal substance exposure

Prenatal substance exposure refers to when a developing foetus is exposed to substances known to cause harm, such as cannabis, alcohol, opioids, stimulants or nicotine. A range of neurodevelopmental conditions can arise in a child due to prenatal substance exposure.

Settings where pregnancy care is delivered (including antenatal clinics and primary care settings) present opportunities for pregnant people to have conversations with health professionals about AOD use. These settings facilitate the provision of health information and support. In NSW, when a person is pregnant, they are routinely asked about their consumption of a range of substances, including nicotine, alcohol and cannabis, and are supported to make informed choices about their substance use. They can also access cessation support.

This routinely collected data about nicotine, alcohol or other drug use can be linked with other datasets, such as the Australian Early Development Census to understand developmental outcomes for children. These linked datasets can help us understand the effects of substances in pregnancy on the pregnant person and child. Research in this field is benefiting from recent projects which support linkage of information collected during the perinatal period with information about early childhood development and educational outcomes.[102]

Condition-specific registries are also an option to support linkage of data across different domains (e.g. health, schooling, justice) but are costly and require significant ongoing support. They are also limited to providing information about already identified people who have been registered to have a condition, rather than a broader patient population. Registries may be limited by case identification, limited service participation, bias in the patients selected for inclusion, and limited ongoing service contact.

Fetal alcohol spectrum disorder (FASD) is a condition that describes a variety of impacts (including cognitive, learning, communication and emotional difficulties) in children exposed to alcohol during pregnancy.[103] Use of other substances along with alcohol during pregnancy can amplify these effects. People with FASD are more likely to develop substance use disorders themselves.[104]

Currently, the Fetal Alcohol Spectrum Disorder Australian Registry (FASDAR) contains the Australian Paediatric Surveillance Unit's (APSU) national surveillance of de-identified cases of FASD in children aged under 15 years.[105] In South Australia and Western Australia, FASD is a notifiable condition meaning clinicians must report cases of FASD to the FASDAR.[106] In other Australian jurisdictions, including NSW, it is optional for clinicians to report to FASDAR (so called 'opt-in') resulting in a likely substantial underestimate of the prevalence of FASD.

The data-linkage approach used to understand the effects of prenatal alcohol exposure on child developmental outcomes can be expanded to other prenatal exposures (such as cannabis) to understand a range of issues where effects and long-term outcomes are experienced by those exposed to substances during pregnancy in a range of functional domains (e.g. employment, schooling). This will support future research into, and greater understanding of, the impacts of substances and the impact of policies, programs and services in NSW.

Comorbid substance use and mental health conditions

Comorbidity refers to the presence of two or more conditions in the same person. When an individual has problems related to both their use of substances and their mental health (from symptoms through to diagnosed illness such as psychosis), these are referred to as comorbid conditions. The relationship between substance use and mental health conditions is complex. People experiencing symptoms of mental illness or psychological distress may use alcohol and other drugs to ease the symptoms they are experiencing. Alcohol and other drug use may cause significant mood and perceptual changes, and a range of brain chemical and structural changes that contribute to or exacerbate mental illness. Further, mental health conditions and substance use disorders share many of the same predisposing factors, such as genetic susceptibilities, adverse childhood and adolescent experiences, and other psychological trauma.[107] Research shows victim-survivors of violence, abuse and neglect have higher levels of AOD use.[108,109]

Both the World Health Organization (WHO)[110] and the American Psychiatric Association[111] describe a spectrum of substance use. For example, WHO describes patterns of substance use from hazardous, through to harmful, and dependent. Similarly, the American Psychiatric Association[111] describes the severity of a 'substance use disorder'. These classification systems are described in detail in section A4 in the Australian *Guidelines on the management of co-occurring alcohol and other drug and mental health conditions in alcohol and other drug treatment settings*.[107]

Mental health and AOD conditions often co-occur and are linked with significant harms to the person, their family, and the community. The 2022-23 National Drug Strategy Household Survey found that adults living with a mental health condition, compared to those without a mental health condition, were more likely to drink alcohol at risky levels (37% compared with 32%), were twice as likely to smoke daily (15% compared with 7.4%) and 1.8 times more likely to use an illicit substance (29% compared with 16%).[112] These differences were even greater when looking at risk factors for people living with severe mental illness, such as chronic psychotic illnesses.[113] Of people entering AOD treatment programs, between 50-76% meet criteria for at least one mental health disorder.[114]

People experiencing comorbid substance use and mental health disorders are at substantially increased risk of premature mortality.[115,116] This may be due to either the risk of dying associated with the conditions themselves (such as suicide or overdose), or because of a greater exposure to known medical and social risk factors for physical diseases, such as smoking and reduced access to healthcare and housing. Most deaths occurring in people living with long-term comorbid substance use and mental health disorder are preventable, and include respiratory illness, cardiovascular disease, and cancers.[115]

Models of care: It is important to ensure that people with comorbid substance use and mental health disorders can access the services they need, regardless of where they present for care ('no wrong door').[117] This requires services to provide holistic care or facilitate easy access to services that might be beyond their focus.

Lack of access to services that can successfully manage both mental health and AOD treatment needs can represent a significant barrier to people receiving comprehensive care. Evidence based approaches to comorbid conditions, including the *Guidelines on the management of co-occurring alcohol and other drug and mental health conditions in alcohol and other drug treatment settings*[107] exist to support the provision of comprehensive care.

There are several models of care for comorbid substance use and mental health conditions (see Table 3). Regardless of the model used, a range of guiding principles are available to organisations and the workforce. Implementation of these is associated with improved treatment outcomes, including symptom remission and experience of treatment. These values and principles of care include, but are not limited to a focus on building a therapeutic alliance with the person accessing

care and their community (family and carers), collaborative care and decision-making tailored to the individual, adopting a trauma-informed and recovery oriented approach, and workforce considerations including staff development, peer support and continuity of care.[107]

Table 3: Care models for people with comorbid substance use and mental health conditions (multiple may occur concurrently)[118]

Model	Description
Sequential treatment	A person is treated for one condition first, then the other condition. Usually, the more severe condition is treated first, though it is often difficult to disentangle the relationship between mental illness and substance use as each can influence the other.
Parallel treatment	Both a person's substance use and mental disorder are treated simultaneously, but treatments are provided independent of each other, usually through different treatment providers. If there are differing treatment philosophies, then the onus of integrating these can fall on the client.
Integrated treatment	Both a person's substance use and mental disorder are treated together by the same treatment provider or service, or through collaborative care arrangements between or within organisations. This approach allows a more holistic management of the relationship between the mental disorder and substance use.
Stepped care	An approach where less intensive and less expensive treatment is used first, then stepped up to other forms of treatment if that is insufficient. This can be either integrated, parallel or single model delivery.
Holistic approach	An approach that supports the whole person and considers their physical, emotional, social and spiritual wellbeing. This approach requires practitioners skilled in the spectrum of care and includes general practice and primary care practitioners.

Systemic challenges in healthcare delivery, including the siloing of services into mental health care, AOD treatment, and physical health care can make the provision of integrated care difficult to achieve in practice. Siloing can lead to lack of clarity regarding who is responsible for monitoring physical health and exacerbate the differences in life expectancy that are experienced by people living with multiple conditions. Finally, people with comorbid substance use and mental health disorders access certain health services at a lower rate than the general population, and face stigma and discrimination in structures and relationships with service providers.

The National Co-morbidity Initiative was launched over two decades ago to improve the capacity for AOD and mental health services to respond to comorbid mental disorders.[119]

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