Managing Methamphetamine Use Evidence Review Report

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Alberta Health Services

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Executive summary

Goal and objectives

The goal of this project was to undertake an evidence review of best practices for managing methamphetamine (MA) use.

The objectives of this evidence review were to determine:

1. Best practices for management of MA intoxication in emergency services
2. Best practices for assessment and management of MA addiction in both inpatient and outpatient community-based care
3. Best practices for management of MA addiction in primary care
4. Best practices for management of MA use at supervised consumption services (SCS)

This review was commissioned by the Alberta Health Services (AHS) Provincial Addiction and Mental Health (AMH) team in preparation for an organizational summit on addressing the rise of MA use in Alberta. Stakeholders participating in the summit include Provincial AMH, the Emergency Strategic Clinical Network (ESCN), representatives from primary care, Population, Public, and Indigenous Health, and other clinicians. This report is intended to be used to inform decisions and next steps for participants of the summit.

Methods

Rapid reviews were used to determine best practices for management of MA use. Searches for academic literature and grey literature were conducted.

A targeted environmental scan (e-scan) was undertaken to supplement the information found through the rapid reviews. The purpose of the e-scan was to investigate best practices for the management of MA use in other jurisdictions. The jurisdictions were limited to Canada and the United States.

Findings

Overall, more evidence is needed to support firm conclusions on this topic. The primary evidence on managing MA addiction and associated behaviours is methodologically inconsistent (the evidence for pharmaceutical treatment is an exception) and is of low to moderate quality. In addition, many aspects of managing MA addiction and MA-associated behaviours are not studied at all, so existing guidelines are often based on expert consensus. The findings from the e-scan should also be interpreted with caution given the small number of representatives interviewed.

With this in mind, below are key findings related to each of the four stated objectives of this evidence review.

Management of methamphetamine intoxication in emergency services

Rapid review

- Emergency department (ED) staff should maintain their physical safety by keeping an escape route in the patient's room, ensuring a second individual is available to assist if necessary, and developing appropriate de-escalation protocols.
- Verbal and non-medical techniques such as a quiet treatment environment and a consistent care provider who is calm, empathetic, and non-judgmental are recommended to de-escalate agitation and aggression associated with mild to moderate MA use.
- MA-induced psychosis may be managed with benzodiazepines as a first-line therapy; atypical antipsychotics may be used if benzodiazepines are insufficient.
- Restraint should be used as a last resort and should be as least restrictive as possible.

Environmental scan

- The majority of interview respondents reported that first responders use olanzapine as a first-line medication for individuals intoxicated with MA who are being transported to the ED.
- Security or law enforcement officers may need to assist with aggressive patients. However, uniformed officers should not be visible to patients unless necessary for staff or patient safety, as their presence has been found to further agitate MA-intoxicated patients.

Management of methamphetamine addiction in community-based care

Rapid review

- Evidence for specific psychosocial interventions for MA addiction is mixed – no modality is clearly superior or inferior. There is some evidence showing that contingency management combined with cognitive behavioural therapy has positive effects on MA abstinence.
- Self-help groups, family support, social work support, needs- and motivation-centered psychotherapy, and sports therapy (e.g., exercise therapy, physical conditioning) were recommended by a clinical guideline although the evidence for these therapies is mixed.
- Pharmacological therapies such as benzodiazepines or atypical antipsychotics are useful for reducing psychotic symptoms and anxiety associated with MA use.

- The evidence supporting pharmacotherapy for mitigating cravings and withdrawal symptoms is mixed. However, acetylcysteine, bupropion, and imipramine have some evidence of effectiveness.
- Sertraline was contraindicated for achieving abstinence.
- Overall, the evidence for pharmaceutical therapies to supplement MA addiction treatment is not strong enough nor consistent enough to be introduced as a standard of practice.

Management of methamphetamine addiction in primary care

Rapid review

- Very little primary evidence exists for managing MA addiction in a primary care setting.
- Patients who are ready to stop using MA should be offered immediate preliminary counselling services and referral to treatment services.
- Patients who are not ready to stop their MA use should be offered harm reduction support and resources.
- Patients should be referred to acute care when they experience paranoia and psychotic symptoms that present a danger to themselves or others, or when they experience severe physical symptoms (e.g., convulsions, liver damage, stroke) of MA use.

Environmental scan

- Primary care staff should be trained in empathy, de-escalation techniques, and nonviolent crisis intervention.

Management of methamphetamine use at supervised consumption services

Rapid review

- Staff should be vaccinated against Hepatitis B and should be educated on proper handling of used equipment. There should be access to safety devices, first aid equipment, and post-exposure prophylaxis.
- There was no conclusive evidence linking SCS with an increase in drug use or public disorder. Some evidence suggested that extended operating hours for the service may in fact reduce public consumption.
- Health services (treatments, referrals, and resources) should be embedded into SCS.
- A positive working relationship with local law enforcement is essential for the functioning of the service.
- Peer workers are a key resource for improving the reach and quality of harm reduction services.

- Homelessness is strongly associated with reduced engagement with harm reduction services. These clients may be reached with mobile outreach services.

Environmental scan

- Staff should be trained in client engagement, de-escalation techniques, and nonviolent crisis intervention. In addition, the physical space should be laid out with safety in mind, including multiple exits and locked inner doors and entry areas. Staff can benefit from structured debriefing sessions after violent incidents.
- Homelessness was found to be very common among SCS clients using MA, and contributes to a variety of health concerns.

Introduction

Methamphetamine (MA) is a synthetic drug that acts as a central nervous system stimulant (Canadian Centre on Substance Use and Addiction (CCSA), 2018). Other members of this drug family are commonly available, either by prescription or illegally. These products include (but are not limited to) caffeine, nicotine, Adderall (amphetamine), Ritalin (methylphenidate), and decongestants (e.g., ephedrine or pseudoephedrine) (CCSA, 2018). MA is a valuable street drug, and may be sold as crystals, powder, tablets, or in rock-like chunks (CCSA, 2018). It may be snorted, ingested, injected, or smoked (CCSA, 2018). Possession of MA is illegal in Canada, and its precursor chemicals are strictly regulated (CCSA, 2018).

MA is highly addictive due to its effects on the release of the neurotransmitter dopamine, which causes feelings of energy, alertness, and euphoria (CCSA, 2018). The dopamine is rapidly released and rapidly metabolized, leading to the "binge and crash" cycle characteristic of many people who use MA (Levy, 2016). It is estimated that 10% of people who use MA develop a substance use disorder immediately after their first use (Standing Committee on Health, 2019). Long-term use of MA is often accompanied by psychotic symptoms, agitation, aggression, and paranoia that can lead to violence (Levy, 2016; CCSA, 2018). Long-term use may also lead to major teeth decay, weight loss, respiratory diseases, and increased risk of cardiovascular disease, and stroke (CCSA, 2018). For people with an MA addiction who stop using, withdrawal is an intense process that takes longer to stabilize than alcohol withdrawal, and there is no specific medical treatment to assist (Standing Committee on Health, 2019).

Survey data from 2015 showed that 0.2% of Canadians self-reported using MA in the past year; this is likely an underestimate of the true rate of use (CCSA, 2018; Standing Committee on Health, 2019). The Standing Committee on Health report released in June 2019 illustrates how MA use has grown at an alarming rate in Canada in recent years:

- In Manitoba, MA use in adults has increased by 104% in the past year, emergency department (ED) visits related to MA intoxication have increased by 1700%, and MA-associated deaths have increased at least three-fold.
- In Alberta, the hospitalization rate for MA use increased by nearly 800% between 2010 and 2015.
- Trauma, social deprivation, and material deprivation are strongly associated with MA use and related ED visits.
- The estimated economic cost of MA use in Canada was $1.1 billion in 2014.[1]

[1] Central nervous system stimulants, which includes methamphetamine but not cocaine.

Determinants of health

There are a wide range of interconnected factors that can contribute to why a person may struggle with MA use. Some of the risk factors for MA use include trauma, homelessness, and a history of mental health conditions and substance use.

Previous research has shown that adverse childhood experiences (ACEs) can negatively impact physical and mental health in adulthood, and can lead to addiction and other chronic diseases (Felitti et al., 1998; Hughes et al., 2017). There may also be higher rates of MA use among individuals with PTSD (Smith et al., 2010), and some research suggests that PTSD can lead to poorer MA treatment outcomes (Glasner-Edwards et al., 2013). Vulnerable population groups who have experienced trauma and abuse, including sex workers and street youth, may be at a particularly high risk of MA use (Bungay et al., 2006; Argento et al., 2017; Goldsmid et al., 2017).

Individuals experiencing homelessness are also at a higher risk of MA use (Standing Committee, 2019). These individuals may use MA for a number of reasons, including remaining alert during the night to protect their property and themselves, coping with cold nights, and self-medicating for unmet health care needs (Standing Committee, 2019).

People who use MA may also do so because of a co-occurring mental health condition or disorder (Standing Committee, 2019). Research indicates that a history of mental health conditions may be a risk factor for MA use (Russell et al., 2008; Goldsmid et al., 2017). A history of substance use, especially heroin and crack cocaine may also be associated with MA use (Marshall et al., 2011; Shannon et al., 2011; Argento et al., 2017). Individuals who have used cigarettes, alcohol, and/or cannabis before the age of 21 may also be at higher risk (King, Vidourek, & Yockey, 2019).

Methods

Rapid reviews

A literature search was conducted by Knowledge Resource Service (KRS) within the Knowledge Management Department of Alberta Health Services. KRS searched for English-language papers published from 2009-2019 in five databases: Medline, PsycINFO, CINAHL, Cochrane Systematic Reviews, and TRIP. See Appendix A for keywords and subject headings.

Articles identified were initially screened by title against inclusion/exclusion criteria (see Appendix B). A total of 201 articles were identified by KRS with references and abstracts provided for further review; 184 articles remained following de-duplication, and 131 articles were excluded from the review. After screening, 53 articles were included in the final qualitative synthesis. No meta-analysis was conducted for this review. See Appendix C for a flow diagram of identified studies. Additional studies were included at a later date to supplement those identified from the literature search.

Environmental scan

A targeted environmental scan (e-scan) was undertaken to supplement the information found through the rapid reviews. The purpose of the e-scan was to investigate best practices for management of MA use in other jurisdictions. The jurisdictions were limited to Canada and the United States. Topics covered in the interviews are the same as those covered in the rapid reviews and outlined in the objectives above.

Jurisdictions willing to participate in the interview were identified through email outreach to contacts known within Alberta Health Services Addiction & Mental Health, as well as contacts identified through news articles from the past year. Snowball sampling was also used by asking contacts to forward the email if they felt another person would be better suited to answer questions related to MA management within the same jurisdiction.

Contacts were informed of the purpose of the e-scan and asked to participate in a 45-60 minute phone interview. Those who agreed to participate were provided with the interview questions in advance. See Appendix D for the email screen and Appendix E for the interview guide.

A total of 11 interviews were conducted with representatives from four jurisdictions in Canada (British Columbia, Manitoba, Ontario, and Saskatchewan), and two jurisdictions in the United States (Arizona and New York). The majority of the representatives were from Manitoba and Saskatchewan. Some contacts worked in multiple settings and were therefore able to answer questions from more than one topic area. See Table 1 for the distribution of contacts by topic and region. To protect respondents' identities, all identifying information has been removed.

Table 1: Environmental scan respondents by topic area and region

Jurisdiction	Emergency settings	Community-based care	Primary care	Supervised consumption services[2]
British Columbia			●	●
Manitoba	●	●●●	●●●	●●●
Ontario				●
Saskatchewan	●	●	●	●●
Arizona	●			
New York	●			

Limitations

Due to time constraints, a systematic review of the literature was beyond the scope of this report. As the purpose of this report was to provide an overview of current literature, the included studies were not thoroughly assessed for quality. The search was limited to articles published in English between 2009 and 2019, so citations outside of these parameters were not included in this review, except in a few cases. Also due to time constraints, a limited number of e-scan interviews were conducted. Given the low number of interviews, it is difficult to draw any robust conclusions from the e-scan findings. Although informative, the findings from the e-scan should be interpreted with caution.

More evidence is needed to support firm conclusions on this topic. The primary evidence on managing MA addiction and associated behaviours is methodologically inconsistent and is of low to moderate quality (though the evidence for pharmaceutical treatment is more robust). In addition, many aspects of managing MA use have little to no available research, so existing guidelines are often based on expert consensus.

[2] Two of the included programs offered harm reduction services, but had not, at the time of interview, been approved as supervised consumption sites by Health Canada.

Findings

Management of methamphetamine intoxication in emergency services

Three articles were identified that addressed how to manage methamphetamine (MA) intoxicated people presenting to the emergency department (ED):

- A clinical guideline from the German Association for Psychiatry, Psychotherapy and Psychosomatics (DGPPN) on managing MA-related disorders (DGPPN, 2016).
- A rapid summary of abstracts on the use of safe rooms for MA-induced psychosis (CADTH, 2018).
- An Australian evidence summary for managing patients with MA-related problems (Drug and Alcohol Services South Australia [DASSA], 2017).

Six interviewees from the e-scan provided their perspectives on best practices for MA intoxication in emergency settings. Contacts worked in EDs in Manitoba, Saskatchewan, Arizona, and New York.

First responders

The e-scan found that four jurisdictions use an atypical antipsychotic (olanzapine) when caring for agitated individuals with MA intoxication before arriving at the ED. Two jurisdictions also mentioned using benzodiazepines at this stage (midazolam).

In addition, one jurisdiction has first responders call ahead to the ED when transporting an agitated patient to give the ED staff time to prepare an appropriate space and gather additional staff to assist if needed.

Staff safety

The articles provided limited evidence on best practice for ensuring ED staff safety. The guidelines published by the DGPPN suggest staff maintain their physical safety by keeping an escape route in the patient room, ensuring a second individual is available to assist if necessary, and developing appropriate de-escalation protocols (DGPPN, 2016). There was no evidence identified that addressed staff psychological safety when managing patients presenting with MA intoxication.

The e-scan found that human force is an important element of safety, with three jurisdictions using security staff to restrain highly agitated individuals. However, two jurisdictions found that the presence of authority figures or security uniforms can further agitate some patients, and should only be used when necessary. In addition, two jurisdictions mentioned the importance of

debriefing with staff after MA-related incidents to ensure their psychological well-being and prevent future safety concerns.

Other strategies for staff safety included:

- using a facemask or a spit mask to protect staff from agitated patients' spit.
- ensuring staff are adequately trained in de-escalation techniques, violence prevention, and assault response.

In addition to concerns for staff safety, one jurisdiction mentioned that other patients have been psychologically affected by witnessing "takedowns" of highly agitated patients. This jurisdiction has made an effort to keep other patients away from areas where such takedowns may happen.

Pharmacological management of MA-induced psychosis and agitation

The clinical guidelines indicate that MA-induced psychosis can be managed by benzodiazepine medication (DGPPN, 2016; DASSA, 2017). Diazepam, lorazepam, and midazolam are recommended. This recommendation is strong but is based on expert consensus rather than clinical trial evidence (DGPPN, 2016). If benzodiazepines are insufficient to treat MA-induced psychosis, there is some evidence to suggest that atypical antipsychotics (e.g., oral olanzapine or risperidone) should be used as the first-line treatment, followed by butyrophenone antipsychotics (e.g., haloperidol), given orally or parenterally, as a second-line treatment (DGPPN, 2016). Of note, this recommendation is only supported by a low level of evidence (DGPPN, 2016).

Medication can also be used to manage agitation and aggression. Guidelines from both Australia and Germany suggest the use of benzodiazepines as a first-line option and atypical antipsychotic medications as a secondary option (DGPPN, 2016; DASSA, 2017). There is a growing body of evidence to suggest that ketamine may be used as a short-acting sedative for people with MA-induced agitation or aggression, but the evidence is not strong enough to recommend ketamine as a best practice (DASSA, 2017).

The findings from the e-scan agree to some extent with the recommendations from the literature:

- Two jurisdictions follow the approach of starting with a dose of a benzodiazepine, and following with an antipsychotic if it is not immediately effective.
- Three jurisdictions recommended managing moderate agitation with a mix of haloperidol and lorazepam (5 mg of haloperidol and 2 mg of lorazepam), administered intramuscularly (IM).
- For severely agitated patients, one jurisdiction recommended using 2-10 mg of midazolam instead of lorazepam, because it is better absorbed IM (and is a safer approach than using an IV), and takes effect in 3-7 minutes.

- Two jurisdictions had success using IM ketamine for their most severely agitated patients. Patients who are given ketamine need to be monitored closely, as they may stop breathing (and this is also true of higher doses of benzodiazepines such as lorazepam and midazolam [7-9 mg]).

The e-scan found that haloperidol was the preferred antipsychotic. However, interviewees also mentioned risperidone, olanzapine, ziprasidone, loxapine, and droperidol as effective alternatives.

There was some disagreement about the best way to administer these drugs. Two jurisdictions preferred to use IV for a faster response than IM, while another found IV to be too dangerous for both staff and the patient, and would only use IM (through the patient's clothes if necessary).

De-escalation

Unless non-medical strategies are ineffective, patients in the ED with MA-induced psychosis, aggression, or violent behaviour should not be administered medication due to the risk of drug interactions (DGPPN, 2016). The DGPPN (2016) guidelines suggest that an MA intoxicated person should be treated in a quiet environment that is as shielded as possible from outside stimuli. The attitude, actions, and communication style of the care provider is important. It is recommended that a single person be designated as the reference contact for the patient; that person should use verbal de-escalation strategies to limit panic, irrational/impulsive behaviour, and aggression (DGPPN, 2016). The reference contact's attitude should be empathetic, accepting, and non-judgmental, and their actions should be careful and planned rather than abrupt and sudden (DGPPN, 2016).

There is some evidence to suggest that safe rooms (spaces designed to promote relaxation and a supportive therapeutic environment) can reduce distress levels and improve psychosocial outcomes in inpatient psychiatric patients (Emanuel et al., 2010; Chalmers et al., 2012; Lloyd et al., 2014). However, a rapid review by the Canadian Agency for Drugs and Technology in Health (CADTH) on safe rooms for patients with MA-induced psychosis found no evidence either for or against the use of safe rooms (2018).

The e-scan findings align with the literature on this topic:

- Four jurisdictions use verbal de-escalation strategies to calm mildly agitated patients.
- Three jurisdictions provide a non-stimulating environment away from other people.
- Two jurisdictions use a single contact person to explain to the patient what is happening and why (particularly when physical restraints are being used).
- Two jurisdictions recommend using a space with low lighting when possible.

In addition, one jurisdiction found that reducing stimuli and using verbal de-escalation techniques are only useful for patients who are mildly or moderately agitated. When a patient is

highly agitated and aggressive, their best practice is to focus solely on safety and medical sedation.

Use of restraints to manage aggressive or violent behaviour

Physical restraint (e.g., human force, physical restraint devices) is not recommended by the German guidelines, as it may lead to further behavioural escalation or patient harm from the effects of MA on physiology (e.g., rhabdomyolysis and hyperthermia) (DGPPN, 2016). The guidelines suggest that use of restraint should be guided by a clear protocol that includes staffing requirements and personal safeguards (DGPPN, 2016). In Alberta, this already exists – AHS has a standing provincial policy that states physical restraint is only to be used as a last resort, and if necessary should be guided by the principles of least restrictive restraint (Alberta Health Services, 2018).

The e-scan found that other jurisdictions use a similar approach to Alberta; the focus is on calming the patient through de-escalation techniques and/or sedation, rather than on restraint. Only highly agitated patients are restrained using physical restraint devices, and then only as long as it takes to be medically sedated. When restraint devices are deemed necessary, these jurisdictions also use the least restrictive option possible:

- One jurisdiction prefers to use soft restraints first, and will change to leather restraints if the medication is not taking effect quickly.
- One jurisdiction reevaluates every 30-60 minutes to loosen restraints as the patient calms down.

Length of stay in the emergency department

It was difficult for the e-scan respondents to generalize about how long a person with MA intoxication would remain in the ED, as it depends on individual factors, the amount of meth taken, and if a sedative was provided. Two jurisdictions stated that individuals who are not sedated are usually released within four hours, compared to 12 hours for those who are sedated. Other factors affecting the length of stay included:

- need to free up beds for other patients
- assessment for underlying psychiatric issues, injuries, and need for social services
- whether the patient was intubated as a result of the sedation process
- the potential amnesiac effect of sedation, which can be traumatizing for the patient upon waking up

Other steps taken before releasing a patient after MA intoxication included:

- referrals to psychiatric care if needed
- providing psychoeducation and information about community support groups and detoxification programs

- providing prescriptions

Involuntary psychiatric admission

The German guidelines state that it may be necessary to involuntarily admit patients to an inpatient psychiatric ward if the patient has severe psychopathologic symptoms that present a risk of harm to themselves or others (DGPPN, 2016). This intervention has a low level of evidence and is only somewhat recommended (instead of strongly recommended) (DGPPN, 2016). In addition, this intervention is context-specific and would be subject to the limitations of the Alberta *Mental Health Act*.

The e-scan found that all jurisdictions could retain patients against their will if they were a danger to themselves or others. However, patients are not always held in a psychiatric ward. In two jurisdictions, admitting patients to a psychiatric ward was only an option if the patient continued to exhibit psychiatric symptoms once sober.

Alternative strategies for patients with mild agitation

No evidence was identified that describes alternative strategies for managing patients who present to acute care with mild agitation.

The e-scan found that all four jurisdictions would refer the person to community resources for substance use. One jurisdiction recommended first assessing the patient for inpatient psychiatric care needs, and providing associated medical care (such as treating skin infections from injections).

Harm reduction supports

All four of the e-scan jurisdictions did not officially offer safe injection supplies through the ED, although providers could choose to provide these supplies to patients. In addition, three jurisdictions mentioned providing naloxone kits, as many people who use MA also use opioids. Two jurisdictions were aware of clean needle sites in the community where they could refer patients.

Management of methamphetamine addiction in community-based care

The body of evidence for managing MA addiction is relatively robust although it is skewed towards primary evidence instead of secondary evidence such as systematic reviews, meta-analyses, and guidelines. The DGPPN clinical guidelines advise a multimodal approach to therapy that includes self-help, outpatient support, and family member education, combined with counselling, occupational and physical therapy if necessary, and other addiction supports (DGPPN, 2016).

These findings are supplemented below with responses from the e-scan, which included representatives from four community care settings in Saskatchewan and Manitoba.

Overview of inpatient withdrawal treatment program supports

All four inpatient withdrawal treatment programs included in the e-scan offer medically supervised detoxification services. Other supports in the programs include the following:

- Three programs provide group programming and support.
- Three programs provide cultural supports and traditional medicine (such as detox sweats).
- Two programs have a 14-day standard stay for withdrawal treatment.
- Two programs offer psychoeducation.
- Two programs include a focus on food and nutrition (both for general health and managing MA cravings with sweet and salty foods).
- Two programs connect patients to community and social supports (including mental health resources, housing, finances, and employment assistance).

Two programs keep their facilities drug-free:

- One program is a lock-down unit that uses urine screening, random checks, and searches upon entry. There is no outside contact except through a shared landline.
- Another program simply monitors through observing behaviour.

If a patient uses drugs while in the program, these programs will often discharge the patient if safe to do so. If it is not safe for them to leave, the patient may be referred to acute care. This decision is made on a case-by-case basis. Both programs work to prevent these issues as much as possible through close monitoring and protocols.

Overview of community rehabilitation program supports

Of the four programs included in the e-scan, three offered family support groups, psychiatric supports, and self-help groups. Other common program offerings included psychoeducation, referrals to other community supports, assistance navigating community resources, and traditional teachings and ceremonies. In addition, one program found that providing transportation to the day treatment facility and daycare for children greatly improved their patients' participation in programming.

There was no agreement among e-scan respondents on whether or how to maintain abstinence in post-acute management. The two programs that responded to this question had different approaches:

- One program does not require its participants to abstain from use in order to participate in its treatment program.

- The other program uses a urine test to determine if a person is sufficiently detoxed to participate in treatment (typically 28 days of no drug use). Once the person is in treatment, staff use the Partners for Change Outcome Management System (PCOMS) to monitor progress and adjust the length of stay accordingly.

There was also a mixed response among these respondents regarding providing harm reduction supplies:

- One program distributes harm reduction supplies that are provided by the province.
- One program does not provide harm reduction supplies, but refers people to the nearby health centre and pharmacy, both of which provide supplies.
- One program does not provide harm reduction supplies, but focus on other types of support.

Psychosocial interventions and other supports

The evidence supporting psychosocial interventions for managing MA addiction is mixed.

- The DGPPN guidelines did not recommend a specific psychosocial therapy modality but offered some clinical guidance.
- There were six systematic reviews identified that examined common psychosocial therapeutic interventions, such as cognitive behavioural therapy (CBT), contingency management (CM), and motivational interviewing (MI).
- Fourteen primary studies were identified that examined novel or modified therapeutic approaches, although these studies were of small to moderate size.

Clinical guidelines from Germany recommend that patient goals should include abstinence from MA and workforce reintegration, but do not recommend a specific modality (DGPPN, 2016). DGPPN suggests that patients be referred to outpatient supports such as self-help groups, family support, and social work support, despite an overall low quality of supportive evidence (DGPPN, 2016). They state that needs- and motivation-centred psychotherapy has higher quality evidence, although the evidence suggests that the overall effectiveness of these therapies is mixed, so are not strongly recommended by the expert panel (DGPPN, 2016).

The six systematic reviews identified in this evidence review showed mixed evidence for psychosocial interventions in MA dependence. Older reviews showed that CBT was an effective modality for reducing MA use, improving program retention, and increasing abstinence from MA (Ciketic et al., 2012; Rajasingham et al., 2012). More recent reviews have shown that CBT has limited effectiveness when implemented alone (Harada et al., 2018; Minozzi et al., 2018), but that CBT in combination with other psychotherapeutic approaches such as CM, family therapy, and counselling is effective for reducing MA use and improving continuous abstinence (Rajasingham et al., 2012; Hellem, Lundberg, & Renshaw, 2015; Minozzi et al., 2018). Motivational interviewing had mixed evidence. One review by Hellem (2016) found that it was

effective for reducing MA use, while another study by the same group found that MI was not effective (Hellem, Lundberg, & Renshaw, 2015). One review found MI to be effective early in the treatment process (Ciketic et al., 2012). Further, MI was not found to be effective for resolving comorbid depression or anxiety (Hellem, 2016; Hellem, Lundberg, & Renshaw, 2015). CM is the most studied psychotherapeutic intervention, and has shown positive effects on continuous abstinence from MA, especially in combination with CBT approaches (Ciketic et al., 2012; Rajasingham et al., 2012; Minozzi et al., 2018).

Fourteen primary studies were identified that evaluated novel or modified psychosocial therapies. Five of the 14 primary studies were conducted in Iran; these studies were small to medium size and have limited generalizability to the Alberta context due to participant selection criteria (Rostami & Dehghan-Arani, 2015; Danaee-Far, Maarefvand, & Rafiey, 2016; Bahrami & Asghari, 2017; Ghasemi et al., 2018; Ghouchani et al., 2018). The primary studies included consist of randomized controlled trials (RCTs), single-arm trials, and evaluations, and should be considered as lower-level evidence that requires confirmation with larger studies that have a robust methodological strategy. Many of these studies have limited generalizability due to participant selection criteria.

Modified psychosocial interventions were not shown to be more effective than the unmodified control ones. These trials looked at intensive motivational interviewing compared to standard MI practice (Polcin et al., 2014) and a CBT+CM intervention that was modified with content specific to gay and bisexual men (Reback & Shoptaw, 2014). Interventions that were asynchronous from a supervising therapist (e.g., online interventions) need more evidence to show effectiveness. Brief online interventions have very little supporting evidence (Sax Institute, 2015) and self-help workbooks have not been evaluated as a stand-alone intervention. A study that incorporated a workbook into a weekly group therapy program found that participants had improved confidence that they could cope with cravings (Matsumoto et al., 2014), but since participants were incarcerated these findings may not be generalizable. A different study of incarcerated youths in Thailand showed that motivational enhancement therapy was effective for improving participants' readiness to change and contemplation of change, compared to the control group (Huang et al., 2011). A third Thai study showed that a behavioural activation and risk reduction counselling intervention was able to reduce sexual risk-taking, reduce the number of episodes of MA use, and improve depression scores (Mimiaga et al., 2012).

The studies from Iran, as described above, were usually small and have limited generalizability. However, there were identifiable themes emerging from the studies. Two of the RCTs involve family members and social work home visits to support people who use MA in addiction treatment; the studies show that the family intervention was superior to the control group in program retention and participation (Danaee-Far, Maarefvand, & Rafiey, 2016), as well as better outcomes related to family status, mental health, and drug use (Ghasemi et al., 2018). Two Iranian trials of acceptance and commitment therapy (ACT) found that ACT is effective for reducing the severity of MA addiction, reducing aggression, and reducing re-hospitalization due

to psychosis, compared to psychoeducation alone (Bahrami & Asghari, 2017; Ghouchani et al., 2018). A trial of neurofeedback training + selective serotonin reuptake inhibitor (SSRI) pharmacotherapy for MA dependency showed significant improvement compared to SSRI therapy alone in medical condition, employment, drug use, legal problems, psychiatric and psychological symptoms, and general quality of life (Rostami & Dehghan-Arani, 2015).

There was limited evidence comparing inpatient and outpatient therapy. A non-comparative study showed that an outpatient stepped-care psychosocial counselling intervention was effective for reducing MA use and improving mental health (McKetin et al., 2013), whereas a more robust quasi-experimental evaluation study of community MA treatments suggested that residential rehabilitation programs are more effective than outpatient programs for improving abstinence rates. By comparison, the client outcomes in an outpatient detoxification program were not significantly different than those in the non-treated control group (McKetin et al., 2012). A qualitative study of an inpatient withdrawal management program did not identify specific therapeutic modalities, but suggested that withdrawal management programs should be designed around the following themes: individualized support for clients (due to the unpredictability of MA withdrawal); staged integration into the full program to limit the disruption to other clients (since MA withdrawal can be unsettling to witness); continuous education for both staff and clients; two-tiered programming so that MA-dependent clients are not required to undergo counselling and planning while experiencing physical withdrawal; and collaboration to improve resource coordination and support staff members (Wiendels, 2017). There were no robust controlled trials that compared inpatient and outpatient treatment protocols.

The e-scan included two withdrawal programs that offer psychosocial interventions. Both programs use CBT and MI, but at different stages:

- One program uses MI most often in this early stage of change to create motivation, and uses CBT in later stages of change to develop goals, maintain progress, and prevent relapse. This program recommended using two online resources at this stage: Matrix Intensive Outpatient Treatment for People with Stimulus Use Disorders (SAMSHA, 2013) and Cracks in the Ice (2019).
- One program uses CBT most often, and starts CBT treatment on the first day of detoxification.

These programs also mentioned additional considerations when providing psychosocial treatment in the withdrawal stage:

- CM should only be used when combined with CBT and MI.
- CBT should be used for at least a year to see results, as there is a high relapse rate for patients who only complete 30, 60, or 90 day programs with CBT.
- All treatment should have a strong basis of trauma-informed care.
- Continuity of care including case management and transitional care, enhances recovery.

Three community rehabilitation programs interviewed offer psychosocial interventions. All three of these programs use CBT. Two programs also use MI and two programs mentioned trauma-informed practice as an important element of their treatment. Other interventions used at this stage included addressing depression, boredom, and grief; and pet therapy.

Pharmacological interventions

The body of evidence regarding pharmaceutical therapies for MA withdrawal and addiction treatment is more robust than the evidence for psychosocial interventions. The literature search identified one clinical guideline, seven systematic reviews, one rapid review, and three primary studies. In general, there is a widespread lack of trial retention and inconsistent methodology to allow for comparison.

The German clinical guidelines for MA-associated disorders offer recommendations for withdrawal and addiction treatment; however, they are generally based on low-quality evidence (i.e., expert consensus). During the withdrawal process, DGPPN guidelines (2016) suggest that low-dose benzodiazepines may be used to limit anxiety, psychosis, or self-harm tendencies, and that atypical antipsychotics may be used as second-line therapy for psychosis. Other pharmaceutical modalities to prevent withdrawal symptoms have very limited evidence; antidepressants and typical antipsychotics are not recommended, and dexamphetamine is only recommended to alleviate withdrawal symptoms in an inpatient setting (DGPPN, 2016). Acetylcysteine is suggested as a craving suppressant during withdrawal, bupropion may help improve MA abstinence, and imipramine may help improve MA treatment program retention (DGPPN, 2016). Sertraline was contraindicated for achieving abstinence (DGPPN, 2016).

The seven systematic reviews and the one rapid review were consistent in their findings regarding the pharmacological agents tested for use in MA dependence. Each review acknowledged the lack of high-quality evidence, and concluded that the evidence does not consistently support or refute the use of pharmaceutical therapies for MA addiction. There is some evidence to suggest that dopamine agonists (such as dextroamphetamine, methylphenidate, bupropion, and modafinil) may reduce cravings and withdrawal symptoms, but evidence for their effect on MA use is mixed (Perez-Mana et al., 2013; Hellem, 2016; Ballester, Valentine, & Sofuoglu, 2017; Lee, 2018). Evidence is mixed for antipsychotic drugs. Some (e.g., Aripiprazole) have mixed success managing MA addiction (Ballester, Valentine, & Sofuoglu, 2017; CADTH, 2019) while others (e.g., risperidone, haloperidol, and quetapine) are recommended for alleviating the psychiatric symptoms that can accompany MA use (Hellem, 2016; CADTH, 2019). Antidepressants also have an inconsistent evidence base. Drugs such as bupropion, mirtazapine, and imipramine have had some success in reducing MA use (Ballester, Valentine, & Sofuoglu, 2017; Lee, 2018), but other studies found that the drugs had no effect (Shoptaw, 2009; Perez-Mana et al., 2013; Hellem, 2016). Sertraline was found to have an increased risk of adverse events and MA use (Ballester, Valentine, & Sofuoglu, 2017), and studies of amineptine showed concerns about the potential for abuse (Shoptaw, 2009). The

broad review by Ballester and colleagues (2017) looked at the literature on gamma-Aminobutyric acid (GABA) enhancers and glutamate/opioid modulators and found limited to no effects. In two reviews by Hellem and colleagues, dietary supplements had a positive effect on anxiety (in the case of creatine) and depression (in the case of citicoline), which resulted in a decrease of MA use over six weeks (Hellem, Lundberg, & Renshaw, 2015; Hellem, 2016). Taken together, these reviews suggest that the evidence for pharmaceutical therapies to supplement MA addiction treatment is not strong enough nor consistent enough to be introduced as a standard of practice.

Two primary studies that investigated the effectiveness of pharmacotherapy were not included in any of the systematic reviews. A small (*n*=40) RCT of riluzole for MA dependency showed significant improvements in addiction severity, withdrawal symptoms, cravings, and depression, and a non-significant trend towards improved treatment retention and lower MA use in participants in the riluzole group (Farahzadi et al., 2019). This suggests that riluzole is a promising treatment option, but more evidence is needed. Another study found that aripiprazole was effective for improving treatment retention and psychopathology, but did not have an effect on MA abstinence (Sulaiman et al., 2013).

The findings from the e-scan also suggest that there is little agreement on best practices for community-based withdrawal treatment. Respondents noted that treatment is highly individualized, tailored to the patient's symptoms and level of arousal. While respondents commonly use benzodiazepines and atypical antipsychotics in this stage of treatment, they differ in their approach. Strategies mentioned included:

- Benzodiazepines for all patients, and often also olanzapine.
- Olanzapine or risperidone for all patients, and diazepam for moderate to severe arousal.

One program uses zopiclone to help with sleep and Wellbutrin to help with cravings. They also noted that due to the high number of people who use multiple substances (and potential uncertainty about exact substances used), it is imperative for staff to be in charge of medication management to ensure there are no adverse reactions to pharmacological treatments.

Evidence-based tools for assessing MA use and mental health

No studies were identified that looked at the development and validation of tools for assessing mental health related to MA use. It is beyond the scope of this review to compare and recommend a rating scale. However, included primary studies and systematic reviews listed the tools used for assessing treatment program outcomes (see Appendix F).

In addition, the e-scan included three community rehabilitation programs that screen for mental health conditions. Two of these programs screen for anxiety, depression, and suicide. The third program works with the Canadian Mental Health Association to have their patients assessed as part of their housing program.

Outreach strategies for MA addiction treatment

No evidence supporting outreach programs for MA addiction treatment was identified. There is evidence to suggest outreach strategies are effective for sharing resources and information about treatment programs, but that body of evidence will be discussed in the SCS section of this report (p. 26).

Management of methamphetamine addiction in primary care

Two sets of clinical guidelines were identified that addressed managing MA use in primary care. These were published by the Best Practice Advocacy Centre (BPAC), based in New Zealand (2018) and DGPPN, based in Germany (2016). It is noted by the BPAC that primary care physicians have many of the skills and tools necessary to care for patients who use MA recreationally or have a mild-moderate dependency (2018). However, there is a paucity of primary research evidence on managing MA use in primary care, so the recommendations made in the guidelines and described in this section are based on a low level of evidence.

Five primary health practitioners in British Columbia, Saskatchewan, and Manitoba participated in the e-scan and provided their experiences in managing MA use in primary care settings.

Family support and safety

Very limited evidence is available regarding best practices for family members of people who use MA. No recommendations were made for caregivers of MA-dependent patients (e.g., parents of children who use MA). It was noted in the BPAC guidelines that the patient's family and community should be involved in treatment planning and supporting the patient (BPAC, 2018).

The German guidelines only provided recommendations on management when an intimate partner uses MA, and the content was principally focused on counselling and monitoring for domestic abuse (DGPPN, 2016). People who use MA and are parents or who may become pregnant should be offered resources on family assistance, sexual risks, pregnancy prevention, and harm reduction for children (DGPPN, 2016). Children of parents who use MA should be carefully monitored for developmental and behavioural problems and supported by therapeutic services (DGPPN, 2016). BPAC suggests that care providers adopt a harm reduction approach to family safety; parents who use MA should ensure that their dependents are with a trusted caregiver before using, and should ensure sufficient recovery time. MA supplies should be hidden and secured, and infants should not be breastfed while MA is still in the body (BPAC, 2018).

Primary care providers who participated in the e-scan mentioned that many patients who are addicted to MA are estranged from their families and/or have restraining orders against them. In cases where the family is present and willing to support the patient, various support may be provided:

- Two providers share information with the family about harm reduction approaches, the stages of change, and appropriate interventions for each stage. Both programs used the same Australian resource for family education (St. Vincent's Hospital Melbourne, 2014).
- Two providers connect the family members to local programs and support groups where available.
- Two providers have found it beneficial to explain to family members that recovering from MA addiction is challenging and can be more difficult than recovering from addiction to other substances.
- One provider discussed the importance of family members setting boundaries with their loved one and being prepared to follow through (for example, not allowing them to stay at the home anymore if they continue to use MA).

It is also worth noting that two providers were not aware of any strategies to support family members, which aligns with the lack of evidence found in the literature, and may indicate a training need for primary care providers who work with this population.

Assessing and treating mild MA-induced agitation in primary care

MA-induced agitation in the primary care setting is not identified in the literature as a common presentation. BPAC suggests that people who use MA in primary care settings are more likely to be scared, anxious, and on edge rather than violent (BPAC, 2018). The DGPPN guidelines recommend using verbal de-escalation techniques, rather than medication, to address mild agitation (2016).

Treating patients who use methamphetamine

The guidelines had limited recommendations for managing patients who attend primary care appointments while intoxicated. Both the DGPPN and BPAC guidelines suggest that general practitioners be familiar with the signs of MA use, such as erratic or agitated behaviour, dilated pupils, tooth damage and decay, excoriations, cachexia, and related attributes (DGPPN, 2016; BPAC, 2018). As described above, patients who exhibit behavioural and psychological characteristics of MA use (such as anxiety and agitation) should be managed with verbal de-escalation techniques (DGPPN, 2016).

Patients suspected of MA use should be asked directly about it (DGPPN, 2016; BPAC, 2018). Two providers interviewed for the e-scan also found this to be an effective approach. BPAC recommends that primary care physicians be familiar with the principles of motivational interviewing, so that they can offer patients who want to stop using MA an immediate preliminary counselling session (BPAC, 2018). Both BPAC and DGPPN suggest that these patients be referred to an addiction counselling program, offered self-help tools, and asked to commit to a follow-up appointment (DGPPN, 2016; BPAC, 2018). Patients who acknowledge their MA use but are not ready to stop using should be offered harm reduction support and resources for when they are ready to stop using (DGPPN, 2016; BPAC, 2018).

The primary care providers in the e-scan most commonly assess for MA use through a drug screen or directly asking the patient if they were using MA. The most common treatment approaches for people mildly agitated due to MA intoxication were:

- Providing medication to deal with agitation and psychosis
- Practicing a harm reduction approach and providing clean supplies
- Verbal de-escalation and nonviolent crisis intervention approaches
- Helping the patient to feel in control of their environment by allowing them to walk around as needed

One program additionally provides the following supports and approaches:

- Offering food and water
- Having a calm, monotone conversation and carefully listening
- Motivational interviewing
- Involving family members for support where possible
- Scheduling follow up appointments and providing additional referrals as needed
- Avoiding involving security guards (uniforms/badges tend to escalate)

Referring primary care patients into acute care

No specific protocols were identified for referring patients using MA from primary care to acute care. The guidelines from DGPPN suggest that patients should be referred to acute care if they are severely intoxicated from MA or experiencing paranoia and psychotic symptoms that present a danger to themselves or others (2016). Patients experiencing intolerable withdrawal symptoms may also be referred to an acute care addiction treatment program (DGPPN, 2016).

The e-scan found that, aside from mental health legislation for involuntary admission, there was no specific protocol for when primary care staff should refer a patient to acute care. The approaches tend to vary depending on the skill set of the primary care physician and their comfort level prescribing antipsychotics. However, there was some consensus in the following situations:

- All five providers would refer a patient to acute care if they were exhibiting signs of self-harming behaviour, suicidal ideation, or risk of harm to others.
- Two providers would refer a patient to acute care if they became too agitated to be contained within the primary care setting, or were unable to cooperate with primary care staff.

One provider noted that while they have used mental health legislation to get patients involuntarily admitted to acute care, they have been frustrated when the patient is released back into the community without care after it is determined that their psychosis is due to stimulant use rather than a psychiatric disorder.

Protocols for transitioning patients between acute care, primary care, and home

No discharge or care transition protocols were identified for transitioning patients between primary care, acute care, and home.

Management of methamphetamine use at supervised consumption services

Nineteen articles were identified that related to SCS, also referred to in this review as “syringe exchange programs” (SEP) and “needle and syringe programs” (NSP). The evidence relating specifically to MA use in SCS was limited, so the literature search was expanded to include literature related to the safe consumption of opioids and other substances. The evidence base for this research question is generally of poor quality – 14 primary studies (five studies cohort or controlled trial, six analyses or qualitative studies, and three evaluation studies) and five pieces of secondary evidence (four guidelines and one scoping review) were identified as suitable for inclusion in this review.

In addition to the findings from the literature scan, the e-scan included seven representatives from four jurisdictions (British Columbia, Manitoba, Ontario, and Saskatchewan), who provided their insights about working with individuals who use MA.

Harm reduction supplies and support

It has been noted that the fundamental principles of harm reduction are the same for amphetamines and opiates, and the risks associated with injecting amphetamines are largely the same as the risks associated with injecting opiates (Harm Reduction International, 2015). Because MA may be smoked or ingested as well as injected, and because of the energizing effect of MA, people who use the drug face a specific set of harms that must be considered (Harm Reduction International, 2015). Specific recommendations include:

- Distributed equipment should include Pyrex pipes, sterile filters and foil, pipe tips, lip balm, burn salve, and empty gelatin capsules in addition to standard injecting equipment.
- Clients should be encouraged to use lower intensity routes of administration and to plan breaks in binge cycles for eating and drinking – SCS may provide snacks, dental hygiene supplies, and a space for sleeping during a crash.
- SCS staff should be prepared to care for clients who experience anxiety and paranoia, such as providing a calm, cool environment, and administering anti-anxiety medication.
- Counselling services, if offered at SCS, should be tailored to individual circumstance and offered when the client is sober.

Staff safety

There was limited evidence identified for best practices to ensure staff safety at safe consumption sites. Part 1 of the Canadian Harm Reduction Best Practices guideline suggests that staff at SCS should be vaccinated against Hepatitis B and should be educated on proper handling of used equipment (Strike et al., 2013). Further, SCS should provide access to safety devices and first aid equipment, and have policies regarding post-exposure prophylaxis in the event of a sharps injury (Strike et al., 2013). Part 2 of the Canadian Harm Reduction Best Practices guideline also recommends a positive working relationship with local law enforcement, although this practice is framed as an important opportunity to educate the police force and to protect clients of SCS rather than a requirement to improve the safety of SCS staff (Strike et al., 2015).

The e-scan respondents agreed on several best practices to ensure staff safety (both physical and psychological):

- Six programs provide staff training in client engagement, de-escalation, and nonviolent crisis intervention.
- Four programs enhance staff control of the physical space, including using locked inner doors and entry areas, and allowing for multiple exits.
- Three programs hold structured debriefing sessions after violent incidents.
- Two programs offer regular staff meetings to address concerns, and provide employee assistance programs for counselling as needed.
- Two programs have clear security plans and protocols in place, including requiring staff to wear personal protective devices (panic buttons).
- Two programs work to reduce client agitation through environmental design in order to limit clients' exposure to people and sounds.
- Two programs mentioned the importance of staff communication around clients at high risk for aggressive behaviour.

It is worth noting that two programs used opposite approaches in their space design, both in an effort to improve safety:

- One program found a small space to be beneficial in developing a trust relationship with their clients, which enhanced safety.
- One program preferred providing a large amount of space for clients to burn off energy and pace, which they found to have a calming effect.

Strategies in providing services

Three programs interviewed for the e-scan mentioned strategies that have worked well for them in providing services to people who use MA. These include:

- Engaging clients with nonjudgmental kindness, a welcoming atmosphere, and an environment where they feel like human beings.
- Keeping clients focused through constant redirection from the time they arrive to the time they leave.
- Taking the time to create individualized care plans for each client, which focuses on areas of difficulty for that person (such as reminders about their schedule, or helping them to stop picking at their skin).
- Instituting a no-banning policy to reduce client agitation. Difficult behaviours lead to a few hours' delay in services, rather than an outright ban.
- Designing the environment for speed of service, client agitation is reduced when they can get in and out of the consumption room as quickly as possible.
- Allowing clients to leave and then return to the post-consumption area as they need.

Addressing community concerns

There was no evidence of specific methodologies for engaging the community when considering the implementation of SCS for people who use MA.

The evidence suggests that community concerns of increased public disorder may be unfounded. Evaluation of an automated syringe dispensing machine (ADM) in Australia found no evidence of an increase in drug use or public disorder. Over 90% of clients already lived within one kilometre of the service, and there was no change in public order in the neighbourhood following implementation of the ADM (Day, White, & Haber, 2016). Similarly, an evaluation of the Supportive Place for Observation and Treatment (SPOT) in Boston showed that there was no correlation between SPOT facility usage and public order measures (active use or exchange of drugs, injection-related litter, over-sedated individuals, or publicly discarded syringes). Rather, public order improvements were more closely related to weather patterns and police patrols (Leon et al., 2018). Further, there was a 28% decrease ($p<0.05$) in publicly over-sedated individuals following SPOT's opening (Leon et al., 2018).

In the United States, buffer zones are sometimes implemented between syringe exchange programs (SEP) and schools, but there is no data on the effects of buffer zones on public order, and it has been shown that these zones disrupt service provision (Allen, Ruiz, & Jones, 2016). Approximately 30% of MA injections occur in public, and 50% of these are outside of the normal SCS operating hours (O'Keefe et al., 2018). Extending the operating hours of SCS could reduce the amount of public MA injecting that occurs in the vicinity of SCS. The drug-using community should be engaged to determine the optimal operating hours of SCS (O'Keefe et al., 2018). In addition, Part 1 of the Canadian Harm Reduction Best Practices guideline states that SCS have an obligation to facilitate the safe disposal of used consumption equipment, whether by encouraging return and disposal, providing portable sharps containers, or placing convenient disposal containers in the community (Strike et al., 2013).

The e-scan found a large variation in community concerns noted by respondents. Two programs mentioned that the primary concern in their communities was an increase in drug use and drug trafficking around the area, while another two programs found that the community was most concerned about SCS affecting businesses and the reputation of the area. Other concerns mentioned included discarded needles in the area, an increase in violence and crime in the area, and personal and family safety.

The respondents agreed on their responses to concerns, which included:

- Partnering with local organizations to provide street cleanup for needles
- Organizing and participating in community advisory panels
- Working closely with the police or RCMP to address community safety concerns
- Reaching out to those who are opposed to SCS, and framing the discussion in terms of the treatment continuum (i.e., not a moral issue, but a health issue)

One program also surveyed neighbourhood residents and businesses, and compiled the results from more than 250 responses (AIDS Saskatoon, 2019). The survey found that local community members supported SCS for many reasons, including:

- Providing a space to discard needles
- Reducing public drug use
- Reducing overdoses, injuries, and deaths
- Reducing the spread of diseases such as HIV and Hepatitis C
- Connecting people who use drugs to community services

Community partnerships and client referral to relevant health and social services

The primary evidence supporting community partnerships and client referral services within SCS is generally consistent but of overall lower quality. However, it is substantially strengthened by the focus on partnerships in the harm reduction guidelines.

The Registered Nurses' Association of Ontario (RNAO) recommends that SCS should include a comprehensive suite of resources and services, such as health services, housing resources, and counselling services (RNAO, 2018). This is consistent with the findings of Burr and colleagues (2014), who described the development of a syringe exchange program (SEP) in partnership with the New Jersey Department of Health (although it has not been formally evaluated). In this model, nurses were embedded in the SEP and were able to provide wound care, overdose prevention counselling, safe injection education, sexual risk education, and referral to treatment programs (Burr et al., 2014). This model may be less effective with people who use MA, however; a cohort sub-analysis of the Vancouver Injection Drug User Study (VIDUS) showed that although SCS use was significantly associated with enrolment in an on-

site detoxification program (p<0.001), this association did not extend to SCS clients who injected MA (Gaddis et al., 2017).

The Canadian Harm Reduction Best Practices (Part II) focuses extensively on how community partnerships and referral services should be embedded into SCS programs. They recommend embedding a community health nurse who may offer vaccines, testing, and some treatment services for common illnesses (Strike et al., 2015). At the very least, the harm reduction program should be able to provide resources and referrals to housing services, substance use treatment, mental health services, and medical services (Strike et al., 2015). The role of SCS in fostering community trust permits the facility to provide low-threshold addiction treatment services (Strike et al., 2015).

The best practice guidelines also focus on the role of community law enforcement as a key stakeholder group that must have a positive relationship with the harm reduction service, even if the partnership is not intended to directly support clients (Strike et al., 2015). An agreement with law enforcement should include terms related to:

- Limiting harassment of clients and confiscation of consumption equipment.
- Educating law enforcement agents on harm reduction principles, occupational safety, and the health and social concerns of clients (Strike et al., 2015).

Despite this relationship being a recommended best practice, a follow-up exploratory study of police training related to harm reduction showed that only 69% of Canadian harm reduction programs had a positive relationship with the local police service, and fewer than 50% of responding programs had a written agreement with law enforcement agencies (Strike & Watson, 2017). Strike and Watson (2017) found that in-service training programs offered education related to the purpose and goals of needle and syringe programs (NSP), prevention of needle-stick injuries, health and social concerns of people who use drugs, effectiveness of NSP injection equipment distribution, and safer smoking equipment; however, the effect of this education has not been evaluated.

The e-scan found that four SCS sites provide client referrals for substance use services (including detoxification facilities and support groups). In addition, programs commonly refer clients to social supports (including housing, mental health care, primary care, and showers), and provided harm reduction supplies.

Peer workers and community outreach

The value of peer workers and community outreach services is well documented in the reviewed literature. Communities of people who use drugs often have several peer workers who may dispense clean equipment, collect used equipment, and share advice and resources (Jozaghi, Lampkin, & Andresen, 2016; Newland, Newman, & Treloar, 2016; Bouchard et al., 2018; Ashford, Curtis, & Brown, 2018). Peer workers are recognized in both Part 1 and Part 2 of the Canadian Harm Reduction Best Practices guidelines and by the Registered Nurses' Association

of Ontario (RNAO) as an important resource for engaging the community in harm reduction, and for sharing information and supplies with high-risk individuals (Strike et al., 2013; Strike et al., 2015; RNAO, 2018).

Although the primary evidence base is of low-moderate quality overall, it consistently shows that peer workers are a positive asset for harm reduction services. Ashford, Curtis, and Brown (2018) showed that a recovery community organization, combined with a peer-offered syringe exchange program (SEP), distributed at least 5,000 syringes in three months and collected at least 600 used syringes. Peer workers engaged more frequently with people who were not on parole or probation, who had a previous health diagnosis, or who were multiracial (Ashford, Curtis, & Brown, 2018). This study noted the importance of peer workers from different cultures and ethnicities (Ashford, Curtis, & Brown, 2018). A qualitative study of the Vancouver Area Network of Drug Users (VANDU) peer network showed that peer networks have played a pivotal role in improving the safety of MA smoking equipment, teaching harm reduction techniques to the broader community, advocating for the community, and supporting the implementation of harm reduction initiatives (Jozaghi, Lampkin, & Andresen, 2016). Another qualitative study of peer networks in Australia found that peer outreach is an effective complement to formal harm reduction programs; in this study, five of the participants were responsible for the distribution of at least 22,000 needles per year (Newland, Newman, & Treloar, 2016). A study of a peer network education intervention in Thailand showed that the peer network intervention was not more effective than the control education intervention for reducing MA use or risky behaviour (Sherman et al., 2009). This study was not of high quality, but the findings suggest that more evidence is needed regarding the role of peer networks for people who use MA specifically.

The e-scan findings align with much of the literature around peer support workers. Five SCS programs use peers, with four of these including peers as paid staff. Peers comprise more than half the staff at one SCS, and another SCS employs peers as the sole staff members in the post-consumption area. These peers take on a variety of roles as frontline staff members, including providing education and harm reduction.

The respondents agreed that peers are integral to their work at SCS:

- Peers help clients access and navigate other services.
- Peers communicate better with clients than medical staff (“They say things to the client that we can’t say”).
- Peers are excellent at crisis intervention and de-escalation, which in turn improves the safety and security of all staff.
- Peers’ lived experience is as valuable as academic experience.

Other strengths mentioned as unique to peer support workers included:

- Peers are not as easily manipulated by clients.
- Peers can get clients into a drug treatment program when they are resistant.

- Conversations between peers and clients are healing and inspire hope in clients.

The programs identified several best practices when employing peers, including:

- Being flexible around work hours (part-time or full-time) and accommodating seasonal changes in peers' ability to work.
- Partnering with other organizations to "share" peer workers across multiple programs.
- Ensuring that peers receiving long-term disability benefits will not be negatively affected by their employment.
- Recognizing that peers don't have to be completely sober to do their job well, and applying the same rules consistently for all staff members (peers or not).

Other outreach strategies, such as mobile needle and syringe programs (NSP), may offer fewer services but be able to reach a broader population (Strike & Miskovic, 2018). An Iranian trial of facility-based and outreach NSPs showed that outreach NSPs were as effective as facility-based NSPs in decreasing the practice of borrowing syringes and reusing syringes, as well as improving HIV testing rates (Nazari et al., 2016). A 2018 scoping review by Strike and Miskovic on outreach harm reduction services noted a number of tradeoffs that must be considered when implementing mobile NSPs:

- Mobile NSPs are able to reach higher risk, harder-to-reach populations, but "missing the van" is a risk factor for needle sharing.
- A large area may be covered, but the van may not accommodate as many people.
- Resources can be shared with a larger segment of the community, but the ability to offer more specialized services may be limited.

Homelessness and MA use

Substance use and related harms disproportionally affect vulnerable groups such as people experiencing homelessness. Ashford, Curtis, & Brown (2018) noted in their study of peer-based harm reduction that homelessness was negatively associated with peer engagement (p=0.05). This is consistent with the findings of a Vancouver-based study showing that homelessness was associated with frequent public injecting (DeBeck et al., 2009). The Canadian Harm Reduction Best Practices guidelines (Part I) recognize that homelessness is associated with reduced use of needle and syringe programs (NSPs), and suggest using peer or outreach workers to reach this population (Strike et al., 2013).

The e-scan respondents stated that homelessness is extremely common among their clients; three programs even found that the majority of their clients are homeless. Four SCS programs mentioned that their clients used MA as a protective measure to allow them to stay awake to protect themselves and their belongings. In winter, some of the clients also needed to stay awake to avoid freezing (although it was noted that frostbite is still a major issue when clients

forget to put on gloves in freezing temperatures). As a result, four programs have a housing worker on staff to connect clients to shelters or longer term housing options. Having a housing advocate can be very helpful for these programs, as some shelters will turn away people who are using substances. In addition, three programs see SCS as a hub to connect clients with the resources they need. As one respondent said, “SCS is an opportunity to engage people and take advantage of moments of motivation to connect them with appropriate resources.”

Other comments about homelessness among people who use MA included:

- People who are homeless and use MA are more likely to be taken to the ED due to erratic behaviours and unaddressed physical health issues.
- It can sometimes be difficult to tell whether a person’s psychosis is due to meth use or lack of sleep as a result of being homeless.
- The risk of using contaminated drugs is much higher for those who are homeless. As one respondent said, “We can’t control what they’re putting in the supplies we give them. People are injecting god knows what.”
- Many SCS clients are concerned about their homelessness due to the involvement of Child and Family Services. SCS housing workers do what they can to get families into supportive living environments.

Conclusions

Overall, more evidence is needed to support firm conclusions on this topic. The primary evidence on managing methamphetamine (MA) addiction and associated behaviours is methodologically inconsistent (the evidence for pharmaceutical treatment is an exception) and is of low to moderate quality. In addition, many aspects of managing MA addiction and MA-associated behaviours have not been studied at all, so existing guidelines are often based on expert consensus. The findings from the e-scan should also be interpreted with caution given the small number of representatives interviewed.

With this in mind, the following key messages can be drawn from the findings of the review:

Management of methamphetamine intoxication in emergency services

Rapid review

- Emergency department (ED) staff should maintain their physical safety by keeping an escape route in the patient's room, ensuring a second individual is available to assist if necessary, and developing appropriate de-escalation protocols.
- Verbal and non-medical techniques such as a quiet treatment environment and a consistent care provider who is calm, empathetic, and non-judgmental are recommended to de-escalate agitation and aggression associated with mild to moderate MA use.
- MA-induced psychosis may be managed with benzodiazepines as a first-line therapy; atypical antipsychotics may be used if benzodiazepines are insufficient.
- Restraint should be used as a last resort and should be as least restrictive as possible.

Environmental scan

- The majority of interview respondents reported that first responders use olanzapine as a first-line medication for individuals intoxicated with MA who are being transported to the ED.
- Security or law enforcement officers may need to assist with aggressive patients. However, uniformed officers should not be visible to patients unless necessary for staff or patient safety, as their presence has been found to further agitate MA-intoxicated patients.

Management of methamphetamine addiction in community-based care

Rapid review

- Evidence for specific psychosocial interventions for MA addiction is mixed – no modality is clearly superior or inferior. There is some evidence showing that contingency management combined with cognitive behavioural therapy has positive effects on MA abstinence.
- Self-help groups, family support, social work support, needs- and motivation-centered psychotherapy, and sports therapy (e.g., exercise therapy, physical conditioning) were recommended by a clinical guideline although the evidence for these therapies is mixed.
- Pharmacological therapies such as benzodiazepines or atypical antipsychotics are useful for reducing psychotic symptoms and anxiety associated with MA use.
- The evidence supporting pharmacotherapy for mitigating cravings and withdrawal symptoms is mixed. However, acetylcysteine, bupropion, and imipramine have some evidence of effectiveness.
- Sertraline was contraindicated for achieving abstinence.
- Overall, the evidence for pharmaceutical therapies to supplement MA addiction treatment is not strong enough nor consistent enough to be introduced as a standard of practice.

Management of methamphetamine addiction in primary care

Rapid review

- Very little primary evidence exists for managing MA addiction in a primary care setting.
- Patients who are ready to stop using MA should be offered immediate preliminary counselling services and referral to treatment services.
- Patients who are not ready to stop their MA use should be offered harm reduction support and resources.
- Patients should be referred to acute care when they experience paranoia and psychotic symptoms that present a danger to themselves or others, or when they experience severe physical symptoms (e.g., convulsions, liver damage, stroke) of MA use.

Environmental scan

- Primary care staff should be trained in empathy, de-escalation techniques, and nonviolent crisis intervention.

Management of methamphetamine use at supervised consumption services

Rapid review

- Staff should be vaccinated against Hepatitis B and should be educated on proper handling of used equipment. There should be access to safety devices, first aid equipment, and post-exposure prophylaxis.
- There was no conclusive evidence linking SCS with an increase in drug use or public disorder. Some evidence suggested that extended operating hours for the service may in fact reduce public consumption.
- Health services (treatments, referrals, and resources) should be embedded into SCS.
- A positive working relationship with local law enforcement is essential for the functioning of the service.
- Peer workers are a key resource for improving the reach and quality of harm reduction services.
- Homelessness is strongly associated with reduced engagement with harm reduction services. These clients may be reached with mobile outreach services.

Environmental scan

- Staff should be trained in client engagement, de-escalation techniques, and nonviolent crisis intervention. In addition, the physical space should be laid out with safety in mind, including multiple exits and locked inner doors and entry areas. Staff can benefit from structured debriefing sessions after violent incidents.
- Homelessness was found to be very common among SCS clients using MA, and contributes to a variety of health concerns.

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Appendix A: Search terms

Table 2: Literature search terms and strings

Concept	Key terms or search strings
Methamphetamine-related behaviour	"crystal meth" OR methamphetamine AND aggression OR aggressiveness OR "behavior/behaviour disorders" OR "risky behavior" OR "risk taking behavior" OR "criminal behavior" OR "sexual behavior" OR "problem behavior" AND treatment OR therapy OR therapeutics OR intervention OR "behavior therapy"
Methamphetamine use	"methamphetamine use" OR "methamphetamine toxicity" OR "methamphetamine dependence" OR "methamphetamine abuse" AND "drug therapy" OR treatment OR therapy OR therapeutics OR "patient care" OR "patient outcomes" OR "treatment outcomes"
Supervised consumption site	supervised injection sites, supervised consumption sites, supervised injection services, opioids, opiates, addiction, overdose, overdose prevention sites, drug consumption sites, harm reduction

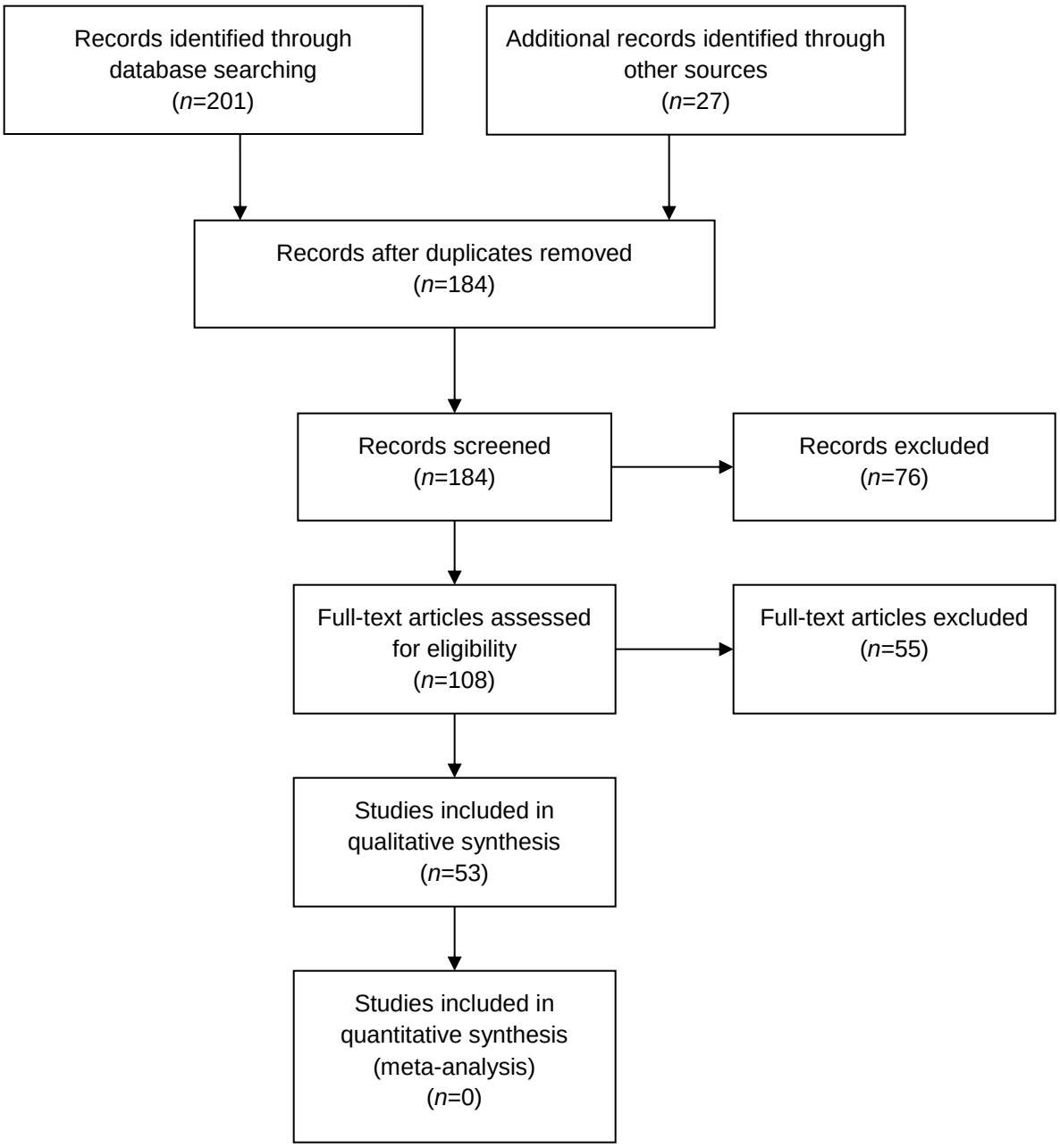
Appendix B: Inclusion and exclusion criteria

Table 3: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
• Article directly refers to amphetamine intoxication or use • Article directly refers to treatment of behaviours associated with amphetamine intoxication or use • Article addresses management of methamphetamine use in inpatient, outpatient, or primary care settings • Article includes outcomes for reducing methamphetamine use • Behaviors present a safety risk to ED or SCS staff (violence, aggression, agitation) • Article discusses models of community engagement for methamphetamine use • Article addresses any age group or gender • Systematic review, meta-analysis, guidelines, primary studies (RCT or Cohort) • Any jurisdiction • Published between 2009-2019 • English language	• Article focuses on substances other than methamphetamine (exception: supervised consumption sites (SCS)) • Behaviours requiring management are not caused by amphetamine intoxication (e.g., psychiatric disorders, other substances) • Article does not clearly describe the practices that resulted in described evidence • Public health interventions (e.g., prevention efforts) • Epidemiology of meth consumption • Description of patterns of use • Policy analysis • Opinion, editorial, narrative (non-systematic) review, study protocol, case study, commentary, trials without publication • Non-human

Appendix C: Flow diagram

PRISMA flow diagram of the identified studies. 53 articles were included in the rapid reviews.



Appendix D: E-scan email screen

My name is [NAME] and I am a [JOB TITLE] with Alberta Health Services (AHS) – Provincial Addiction & Mental Health. Our team is currently gathering information that will inform the development of best practices for behaviours associated with methamphetamine use in different healthcare settings.

One aspect of our work is to identify and report on best practices from other jurisdictions. We received your contact information from [NAME], who recommended you as an excellent resource for us to learn about [JURISDICTION]'s methamphetamine treatment practices. The interview will cover four topics:

1. Management of methamphetamine intoxication in emergency settings (e.g., emergency departments)
2. Management of methamphetamine addiction in community-based care (inpatient and outpatient rehabilitation)
3. Management of methamphetamine use in primary care
4. Management of methamphetamine use at supervised consumption services

Appendix E: E-scan interview guide

Name:

Job title:

Institution/organization:

Date:

As mentioned in the email you received, Alberta Health Services (AHS) is in the process of collecting information that will inform the development of best practices for behaviours associated with methamphetamine use in different healthcare settings. The interview will cover four topics:

1. Management of methamphetamine intoxication in emergency settings (e.g., emergency departments)
2. Management of methamphetamine addiction in community-based care (inpatient and outpatient rehabilitation)
3. Management of methamphetamine use in primary care
4. Management of methamphetamine use at supervised consumption services

One aspect of our work is to identify and report on best practices from other jurisdictions. The purpose of this interview is to learn from your expertise and experiences.

We plan to record this conversation to ensure we capture everything that's discussed. The information you provide will be confidential, which means that the final report we prepare will not link your name with the information you provide; however, your jurisdiction will be identified. The interview will take about 45-60 minutes to complete. Are you still willing to participate in the interview?

Section A: Emergency services

The first several questions will focus on the management of methamphetamine intoxication in emergency settings (e.g., emergency departments, intensive care units).

A.1 Are you aware of any strategies used by first responders (EMS) when caring for individuals with methamphetamine intoxication before arriving at the emergency department? If yes, please explain.

A.2 What non-pharmacological measures are considered best practice when an individual presents with methamphetamine intoxication in the emergency department?

a. Are they treated in a quiet, non-stimulating environment? If yes, please explain.

b. What measures are used with aggressive patients? (e.g., de-escalation strategies)

A.3 What non-pharmacological measures are taken when an individual intoxicated with methamphetamine exhibits severe psychopathologic symptoms that pose a risk of harm to themselves or others?

a. Are they admitted to a psychiatric ward against their will?

b. Are restraints used? If yes, what type of restraints?

A.4 When are pharmacological interventions considered best practice in individuals presenting with methamphetamine intoxication?

A.5 When pharmacological interventions are necessary, what is the medication of first choice?

a. Are benzodiazepines used? (e.g., diazepam, lorazepam, midazolam)

b. Are there standard recommended doses?

A.6 What steps are taken if the medication of first choice proves ineffective?

a. Are antipsychotics used? (e.g., olanzapine, risperidone, haloperidol)

b. Are there standard recommended doses?

A.7 What strategies are used to ensure staff safety (physical and psychological) when managing individuals with methamphetamine intoxication?

a. Are different strategies used when the patient is severely agitated? If yes, what are they?

A.8 How long is the average length of stay in the emergency department for an individual with methamphetamine intoxication?

a. Are there any issues surrounding length of stay? (e.g., overcrowding, bed shortages, wait times)

A.9 What measures are taken after an episode of methamphetamine intoxication?

a. Are comprehensive medical and psychiatric diagnoses provided?

b. Are any psychosocial interventions used? (e.g., psychoeducation)

c. Is the individual connected with professional addiction, harm reduction, and/or mental health services? (e.g., psychiatrists, outpatient clinics specializing in addiction, counseling centres)

d. For patients injecting drugs, are harm reduction supplies provided?

A.10 When individuals present with mild agitation, and emergency services are not required, what types of immediate services and supports should individuals be directed to?

A.11 What evidence was used to inform the best practices discussed in this section? (For example: research, best practice guidelines, benchmarks, internal evaluations, etc.) Can you share the documents with us?

Section B: Community-based rehabilitation

The next set of questions will focus on the assessment and management of methamphetamine addiction in community-based care (inpatient and outpatient rehabilitation).

Inpatient withdrawal treatment

B.1 What types of supports are provided to individuals during inpatient withdrawal treatment? (e.g., self-help groups, family support)

B.2 What monitoring strategies are used to verify that the treatment setting is drug-free? (e.g., toxicological urine screening tests)

B.3 What measures are taken if the patient is demonstrated not to be drug-free?

a. Is treatment intensified? Is treatment discontinued?

B.4 What medications are considered best practice during inpatient withdrawal treatment?

a. antidepressants?

b. antipsychotics?

c. benzodiazepines?

d. simulants?

e. other?

B.5 What psychosocial interventions are considered best practice during withdrawal treatment?

a. cognitive behavioural therapy?

b. motivational interviewing?

c. contingency management?

d. psychoeducation?

e. other?

Post-acute management

This phase applies to individuals who are currently abstinent, as well as current users. Post-acute management can be delivered in outpatient, day treatment, or inpatient settings. The goal during this phase is to increase treatment retention, reduce cravings, and achieve abstinence.

B.6 What tools are used to screen for methamphetamine use?

B.7 What tools are used to screen for mental health problems in individuals who use methamphetamine?

B.8 What types of supports (e.g., self-help groups, family support, social services) are provided to individuals during this phase of care?

B.9 What psychosocial interventions are considered best practice during this phase of care?

a. cognitive behavioural therapy?

b. motivational interviewing?

c. contingency management?

d. psychoeducation?

e. other?

B.10 What medications are considered best practice during this phase of care?

a. antidepressants?

b. antipsychotics?

c. benzodiazepines?

d. simulants?

e. other?

B.11 For patients injecting drugs, are harm reduction supplies provided?

B.12 What evidence was used to inform the best practices discussed in this section? (For example: research, best practice guidelines, benchmarks, internal evaluations, etc.) Can you share the documents with us?

Section C: Primary care

The next set of questions will focus on the management of methamphetamine use in primary care.

C.1 What are the recommended best practices when caring for mildly agitated patients who are using methamphetamine?

a. What tools can primary care providers administer to assess for methamphetamine use?

b. What treatment strategies are recommended?

C.2 When should primary care providers refer a patient to acute care?

a. Is there a recommended protocol to follow? If yes, please explain.

C.3 For patients injecting drugs, are harm reduction supplies provided?

C.4 What instructions should family members receive when a loved one is transitioning from acute care to primary care (and to home)?

C.5 What strategies can family members use at home when caring for a loved one using methamphetamine?

C.6 What evidence was used to inform the best practices discussed in this section? (For example: research, best practice guidelines, benchmarks, internal evaluations, etc.) Can you share the documents with us?

Section D: Supervised consumption services

The final set of questions will focus on the management of methamphetamine use at supervised consumption services.

D.1 What strategies are used to ensure staff safety (physical and psychological) at supervised consumption sites?

D.2 What types of resources and supports are provided to individuals who use methamphetamine at supervised consumption sites?

a. What types of services should individuals be referred to?

D.3 What roles do peer support workers and community outreach workers have at supervised consumption sites?

a. What value can they bring to supporting individuals who use methamphetamine?

D.4 What are some of the major issues facing communities with supervised consumption sites? (e.g., discarded needles)

a. What are some strategies to address these issues?

D.5 What impact does homelessness have on methamphetamine use?

a. How can supervised consumption sites provide support for homeless individuals?

D.6 What evidence was used to inform the best practices discussed in this section? (For example: research, best practice guidelines, benchmarks, internal evaluations, etc.) Can you share the documents with us?

In closing, is there anything else you'd like to mention that you haven't already told us?

Appendix F: Assessment tools

Table 4: Evidence-based tools for assessing MA use and mental health

Reference	Tools
CADTH, 2019	Visual Analogue Scale (VAS) for cravings, Clinical Opiate Withdrawal Scale; Amphetamine Withdrawal Questionnaire; Beck Anxiety Inventory; Beck Depression Inventory II
Carrico et al., 2018	Differential Emotions Scale, Five Facet Mindfulness Questionnaire, Penn Alcohol Craving Scale
Farahzadi et al., (2019)	Amphetamine Selective Severity Assessment, Amphetamine Withdrawal Questionnaire, Stimulant Craving Questionnaire, Visual Analogue Scale for Craving, Hamilton Depression Rating Scale, Addiction Severity Index
Ghasemi et al., 2018	Addiction Severity Index
Hellem, 2016	Hamilton Anxiety Rating Scale, Addiction Severity Index, Addiction Severity Index Lite (ASI), Brief Psychiatric Rating Scale, Depression Anxiety-Stress Scale, Beck Anxiety Inventory
Huang et al., 2011	University of Rhode Island Change Assessment (URICA)
Matsumoto et al., 2014	Drug Abuse Screening Test (DAST-20); Self-efficacy Scale for Drug Dependence (SSDD); Stages of Change, Readiness, and Treatment Eagerness Scale, 8th edition (SOCRATES)
McKetin et al., 2013	Opiate Treatment Index; Severity of Dependence Scale (SDS); Brief Psychiatric Rating Scale (BPRS)
Mimiaga et al., 2012	Montgomery-Asberg Depression Rating Scale (MADRS), Behavioral Activation Scale (BADS)
Polcin et al., 2014	Timeline Follow-Back (TFLB) for MA use self-report; Addiction Severity Index-Lite
Rostami & Dehghan-Arani, 2015	Addiction severity index (ASI), Symptoms Check List-90 (SCL-90), World Health Organization Quality of Life (WHOQOL)

Sulaiman et al., 2013	MINI International Neuropsychiatric Interview (M.I.N.I.), Brief Substance Craving Scale (BSCA), Positive and Negative Symptoms Scale (PANSS), Clinical Global Impression Scale (CGI); Abnormal Involuntary Movement Scale (AIMS), Barnes Akathasia Scale (BAS), Simpson Angus Scale (SAS)