Review of Withdrawal Management Services: Models and Practices

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1.0 Introduction

A 2014 review of withdrawal management services (WMS) in the province of New Brunswick highlighted the need for a broader continuum of evidence-based service options (Pellerin, Salmon & Lynch, 2014). As of 2018, WMS was limited to inpatient 24-hour care within hospital settings in the province, despite the fact that there is evidence supporting the delivery of WMS in other contexts, including in community residential and non-residential settings, and with an important role for primary care. There is also an inequitable distribution of physician resources across the province and a lack of awareness, and use of, addiction medicine. These issues, together with the rapidly changing landscape of substance use/addiction issues, particularly the escalating concerns related to opioid substance use, has prompted the government of New Brunswick to commit to the enhancement and modernization of WMS in the province.

To support this commitment, VIRGO Planning and Evaluation Consultants Inc., an external consulting company, was commissioned to conduct a review of evidence-based models, approaches and practices for WMS. This document is the final report summarizing the results of this work.

1.1 Areas of focus

The review was designed to answer the following questions:

1. What evidence-based models of WMS currently exist nationally and/or internationally (including inpatient, residential, and community-based models, and social models)?
2. What is the evidence regarding the role of WMS within the broader continuum of substance use services?
3. What is the evidence for WMS within the context of primary health care settings specifically?

4. What is the evidence for specific treatment approaches for withdrawal management, including for different substances[1] and levels of severity, as well as for individuals experiencing co-occurring problem gambling issues?
5. What is the evidence supporting maintenance/ replacement therapy within inpatient WMS settings?
6. What is the evidence with respect to the role of addiction medicine within WMS?
7. What key considerations are relevant to identifying the appropriate mix and level of competencies for the workforce that is needed to support an evidence-based system of WMS?

The consultant team was also asked to compare New Brunswick's *2016 Detox Withdrawal Management Protocols and Guidelines* with the findings from the above areas of focus to provide recommendations for revisions, updates and/or new content to be included. This analysis is presented in Appendix A.

[1] While nicotine withdrawal management was out of scope of this review, it was given consideration in the analysis of New Brunswick's *2016 Detox Withdrawal Management Protocols and Guideline* (Pellerin, Salmon & Lynch, 2014; described above).

2.0 Methods for review

2.1 Conceptual framework

The review was organized according to the following three levels:

1. System – this level focuses on the evidence regarding how WMS fits within the broader continuum of substance use services, and, as relevant, within the larger mental health, health and social service system (see sections 5.0 and 7.0), as well as on system-level implications for WMS workforce planning (section 8.0)
2. Services – this level focuses on the evidence regarding the different models of service for withdrawal management (section 4.0).
3. Interventions – this level focuses on the evidence regarding specific interventions and approaches for WMS, including medication prescribing practices (section 6.0).

Table 1 offers a mapping of areas of focus, identified in section 1.1 above, onto these three levels of the review.

Table 1. Mapping of areas of inquiry and levels of review

Areas of Inquiry		**Level of Review**		
		System	Service	Intervention
1	Evidence-based models of WMS		X	
2	WMS and the broader continuum of substance use/addiction services	X		
3.	WMS and primary health care	X	X	X
4	Treatment approaches for withdrawal management			X
5.	Maintenance/replacement therapy within inpatient WMS settings			X
6.	Role of addiction medicine within WMS		X	X
7	Workforce mix and competencies	X	X	

2.2 Data collection and analysis

Literature review: An initial search conducted via internet search engines (PubMed, Google, Google scholar, Cochrane Library) was conducted for literature (both published and grey) relevant to the areas of focus identified for the review (section 1.1), and was limited to the general adult population. Given the broad scope of the review, the most recent literature, as well as systematic and narrative reviews and syntheses, were prioritized. Further literature was identified following screening of the literature obtained from the initial search, as well as by recommendation of key informants (see below).

Key Informant Interviews: Key informants were identified and contacted for an interview based on their experience and expertise in the various areas of focus of the review. A total of 14 stakeholders were interviewed, between October and December 2019 (see Appendix B for a list of all key informants).

Analysis: A coding template was developed and used to extract and organize qualitative date from the key information interviews. These data were then consolidated and synthesized with the data extracted from the literature to identify key themes in each of the areas of focus and according to the conceptual framework developed for the review.

Supplementary Information: Dr. Brian Rush is leading a separate national project to conduct a survey, and develop a database, of WMS across the country, including in New Brunswick. While this work is still ongoing, a preliminary estimate of the number and proportion of different types of WMS that are currenty operating in Canada is provided in the present report to illustrate the relative balance of hospital and community services dedicated to WMS as well as the relative balance of residential and non-residential programs.

3.0 Withdrawal management defined

A withdrawal management service (WMS) is a comprehensive service offered to individuals who are experiencing the effects of cessation of prolonged use of alcohol and or/other drugs. While precise definitions of withdrawal management vary in the literature, it is generally agreed that there are three aspects or objectives of service delivery:

1. Safely manage any acute medical, psychological and/or behavioural complications arising from ceasing to use one or more psychoactive substances (commonly referred to as "detoxification"). This may involve the gradually tapering of the substance in a safe and effective manner or substituting it with a cross-tolerant pharmacological agent, and then gradually tapering that agent.
2. Provide a period of rest and stabilization in a supportive and humane environment that is respectful and protective of the person's dignity.
3. Prepare for and assist with accessing a range of substance use/addiction treatment and other services (e.g., medical, mental health, social, and/or spiritual) that will support recovery (British Columbia Ministry of Health, 2017; Centre for Substance Abuse Treatment, 2006; Government of Saskatchewan Ministry of Health, 2012).

While, from a treatment system planning perspective, each of these three aspects of WMS must be considered, they may be given differential weight by different stakeholders and for different sub-populations. For example, for some individuals with chronic challenges related to substance use/addiction and low or no motivation for treatment, service goals may focus more on safe management of (public) intoxication. For others the motivation and preparation for a subsequent phase of treatment and support will be more salient. This variability is reflected in the different service delivery models discussed below.

Notably, experts generally agree that WMS is distinct from treatment and other support services that are designed to facilitate the longer-term recovery from substance use/addiction (Centre for Substance Abuse Treatment, 2006), and that, on its own, is not effective in maintaining recovery (Meister et al., 2018). This was echoed in the characterization of WMS by one expert stakeholder as often being "necessary, but not sufficient". Further, there is accumulating neurobiological evidence that withdrawal drives the maintenance of substance use/addiction through a mechanism of reward dysfunction and negative reinforcement (Schlienz &

Vandrey, 2019). In other words, the avoidance of the negative symptoms of withdrawal is a critically important reason for continued use of the substance, a factor particularly salient for substances such as opioids (Fishman et al., 2019).

Regionally and nationally, the provision of WMS is extremely resource intensive. While the overall cost of WMS in Canada is not known, according to data reported in 2015-2016 by six Canadian provinces (Meister et al., 2018), WMS accounted for a quarter (24.6%) of all service events[2] related to substance use treatment services (26.9% for males and 20.8% for females). In that same year, hospitalizations for withdrawal management accounted for 30% of all hospitalizations for substance-related disorders (Meister et al., 2018). No doubt many factors determine the rates of service use, including not only level of need in the community but also the awareness, availability and accessibility of services. Also, as noted above, sex and gender differences prevail, with males accounting for more use of WMS. These differences no doubt reflect underlying variation in patterns of substance use as well as barriers to accessing services for women, such as childcare responsibilities. Overall, these findings reinforce the call for sex and gender lens when developing service-related policies (Greaves & Poole, 2007; see also section 9.0).

[2] A service event includes new admissions to a WMS as well as transitions from one type of service to another.

4.0 The evidence-base for WMS

4.1 The evidence underlying different models

It is challenging to categorize the various models of WMS given the mix of objectives cited above; the variation in medical and psychosocial interventions offered and corresponding mix of professionals engaged in their delivery; and the many alternative ways in which services can be offered, particularly on a non-residential basis. Research syntheses, guidelines and standards also vary with respect to their level of focus—with some focused on particular substances, most commonly alcohol and opioids, and others being more "substance-neutral". Relevant literature is also drawn from different countries, in particular, Australia, the UK, and Canada, each of which has its own traditions and program taxonomy to describe the treatment system and its components.

In Canada, the national Needs-Based Planning (NBP) project, led by Brian Rush and his team at the Centre for Addiction and Mental Health (CAMH), has developed a classification system for substance use/addiction services which standardizes the terminology for alternative program models. The purpose of these common definitions is to assist in estimating capacity requirements and undertaking a gap analysis for planning and system enhancement. The first iteration of the NBP model (Rush, Tremblay & Brown, 2019) incorporated three WMS models: (1) the Home-based/Mobile model, which encompasses a range of non-residential options; (2) the Community Residential model which is typically described in the literature as a "social detox model", but which operationally also includes varying levels of access to medical supports; and, (3) the Hospital/ Complexity Enhanced model which essentially involves hospitalization and immediate access to a comprehensive range of medical and psychiatric supports. This classification system is similar to that used in Australia (e.g., Grigg et al., 2018).

While these three broad categories have proven useful for needs assessment and recent syntheses of relevant literature (e.g., a literature review conducted in Nova Scotia), a fourth WMS category model, namely Acute

Intoxication Services, was incorporated into an updated NBP model.[3] This addition to the NBP model recognizes a small but growing sub-sector of WMS that focuses solely on the immediate and safe withdrawal from alcohol or other drugs and with little (or no) emphasis on transitions to subsequent treatment and support. Various provisions may be made, however, for responding to acute medical emergencies (e.g., close proximity to a hospital emergency department; access required by emergency medical services (EMS) with brief medical assessment). The term "sobering centre" has been used in some jurisdictions for this WMS model, although it is important to recognize that hospital emergency departments often routinely provide this function outside the context of any specialized substance use/addiction programming.

It is also important to note that the national NBP model and its classification system for WMS and other substance use services is grounded in the co-called "tiered model" which is itself widely recognized as an evidence-based conceptual framework for system planning and performance measurement (see for example, the Canadian National Treatment Strategy (National Treatment Strategy Working Group, 2008); Rush (2010); and the VIRGO report on the Manitoba Mental Health and Addictions Strategy (VIRGO Planning and Evaluation Consultants Inc., 2018).

Table 2 provides a high-level summary of the current models for WMS in the national NBP project, recognizing that there is variability within these four categories in terms of their operationalization. Following Table 2, we summarize the international evidence and criteria for matching individual strengths and needs to the different WMS models, as well as key principles underlying WMS services in general. We then turn to a sub-section on each of the four categories of WMS on the NBP model, drawing more heavily on our findings from the key informant interviews and their perspectives on the Canadian experience with these options for WMS.

In reviewing this synthesis of literature, it is also important to keep in mind that key findings and recommendations are summarized at the level of the WMS "model" and not specifically for the effectiveness of specific types of interventions that may be incorporated into these models. Importantly, the effectiveness of

[3] The final technical report for the updated NBP model is still under development. Current citations incorporating the updated model and definitions of its service categories include (B. Rush, Lisbon presentation and recent reports applying the revised planning model (e.g., Rush, B. NE LHIN reports). These materials can be accessed by contacting Dr. Rush at brian.rush@camh.ca.

any WMS will be influenced by the relative emphasis on pharmacological strategies (using medications to help manage withdrawal), psychosocial strategies (using cognitive, counselling and/or psychosocial supports); or a combination of pharmacological and psychosocial strategies. Any approach used should be tailored to the needs of the individual and the type of substance or substances (Meister et al., 2018). A number of studies recommend combining pharmacological and psychosocial strategies that can jointly address the chemical dependence and psychological factors contributing to the substance use/addiction (Diaper, Law, & Melichar, 2014; Merkx et al., 2014). The effectiveness of these strategies is reviewed in Section 6.0 below for specific substances.

Table 2. Summary of four levels of care of withdrawal management services (WMS)[4]

Model	Definition	Considerations	Examples
Acute Intoxication Services	• Provides safe, short-term monitoring and management of symptoms of an episode of heavy alcohol and/or other drug use that cannot be managed at home • Length of stay is typically brief (e.g., less than 24 hours) • This service is offered to clients that do not have an apparent medical or psychiatric condition necessitating emergency interventions	• Focus on safe detoxication • Provision for emergency access to medical supports • Limited focus on treatment continuity	Sobering centers Stabilization units Short-term admissions to community residential WMS
Community Non-Residential Withdrawal Management Services	• Voluntary withdrawal management services and supports provided in a client's home or other safe accommodation (via on-site visits or web-based support),	• Safety in the home and support for medication management • Provision for medical supports	Home or mobile team-based WMS

[4] From 2016/18 Canadian Needs-Based Planning service categories

Model	Definition	Considerations	Examples
	or from a central location offering day services • May involve varying levels of medical management and supports, including assessment by a physician or other qualified health care workers, as well as regular monitoring support • Before discharge, clients are supported to connect with post-withdrawal treatment and support services (e.g., assessment and treatment planning)	• Generally mild to moderate severity with capacity varying with level of medical supports provided • Strong focus on transition to subsequent treatment and supports	"Daytox" services Internet/telephone - facilitated based WMS
Community Residential Withdrawal Management Services	• Voluntary withdrawal management services and supports in a non-hospital residential setting • Services are typically non-medical in nature but with linkages to a hospital for quick access to medical emergencies • May, however, involve varying levels of medical management and supports, including assessment by a physician or other qualified health care workers, as well as regular monitoring support • Before discharge, clients are supported in connecting with post-withdrawal treatment and support services (e.g., assessment and treatment planning)	• Previous unsuccessful attempts at community non-residential WMS • Provision for medical supports and access to emergency services • Generally moderate severity with capacity for managing more severe withdrawal symptoms varying with level of medical supports provided in-house • Strong focus on transition to subsequent treatment and supports	Community-based "social model" WMS centre Community-based WMS centre with some low to moderate intensity in-house medical supports Designated beds or bed/days as an initial phase of community residential treatment or for transition to non-residential treatment and support
Hospital/ Complexity-enhanced Residential Withdrawal	• Voluntary care is provided within the structure of a health care setting with a high level of medical and psychiatric capability	• High severity of withdrawal symptoms and corresponding high level of required medical and psychiatric supports	Medical WMS unit in hospital Designated beds or bed/days as an initial phase of hospital-based

Model	Definition	Considerations	Examples
Management Services	• Typically involves the use of designated hospital beds and medication management (e.g., to assist with physical stabilization and withdrawal, and/or co-occurring mental disorders) • Before discharge, clients are supported to connect with post-withdrawal treatment and support services (e.g., assessment and treatment planning)	• Multiple repeat attempts at withdrawal management (any setting) • Involvement of multiple substances with physical and mental sequalae in withdrawal • Strong focus on transition to subsequent treatment and supports	residential treatment or for transition to community residential or non-residential treatment and support

The research literature, and related criteria for matching to the type of WMS, give considerable attention to comparing the effectiveness and appropriateness of non-residential options (typically referred to as community or ambulatory WMS), with residential options. By and large, the literature on community or ambulatory WMS refers to home-based services with support provided by a primary care physician and perhaps others in a multi-disciplinary team. Residential options are often grouped under a broad category of "inpatient" services, which typically refers to hospital-based WMS. Given the broad categorizations in much of the research literature, it is important to keep in mind that not all the nuances within the four broad categories of the above-mentioned NBP model have been the subject of rigourous evaluation. Similarly, as briefly noted above, much of the literature on WMS models is substance specific, most often focused on alcohol (e.g., Muncie, Yasinian, & Oge, 2013; Perry, 2014; Nadkarani et al., 2017) and opioids (Canadian Research Initiative on Substance Misuse, 2018), but also including methamphetamine (Grigg et al., 2018), or combining multiple substances together. We make these distinctions below where necessary.

Generally speaking the evidence and expert opinion expressed in the literature suggests that "severe addiction" may be better addressed in highly controlled environments such as inpatient withdrawal management settings, whereas in other less severe instances, outcomes may be more successful and cost-effective in non-residential withdrawal management settings (Diaper et al., 2014; European Monitoring Centre for Drugs and Drug Addiction, 2014; Muncie, Yasinian & Oge, 2013). This summative view is expressed, for example, in United Nations/WHO treatment guidelines (United Nations Office on Drugs and Crime & World Health Organization, 2017) whereby inpatient WMS settings are recommended for individuals at risk of severe withdrawal, who have concurrent serious physical or psychiatric disorders, and/or who lack adequate support. Importantly, while the strength of this recommendation was "strong", the quality of evidence behind it was rated as "low".

Underlying the recommendation for differential use of inpatient versus community WMS, based broadly on "moderate" or "severe" addiction, is the need to assess severity of withdrawal symptoms, ideally with a validated tool and severity rating process such as the CIWA in the case of alcohol (Sullivan et al., 1989; see also section 6.1.2) or the COWS for opioids (Wesson & Ling, 2003; see section 6.2.2). In this regard, a mild to moderate level of withdrawal severity, as determined by the scoring results, is seen as

a level appropriate for a community/ambulatory WMS, whereas a level of severity in the moderate to severe range signals the need for inpatient WMS.

The importance of measuring withdrawal severity is clearly embedded in the criteria for community versus inpatient WMS advanced by the American Society of Addiction Medicine (ASAM; American Society of Addiction Medicine, 2015; Gastfriend & Mee-Lee, 2004). These commonly used criteria encompass six dimensions of the person's past and present situation, of which the first dimension is Acute Intoxication and/or Withdrawal Potential. The other five dimensions are 2. Biomedical Conditions/Complications; 3. Emotional/Behavioral/ Cognitive Conditions and Complications; 4. Readiness to Change; 5. Relapse/Continued Use/ Continued Problem Potential; and 6. Recovery Environment. Importantly, the rating of withdrawal severity is not a stand-alone factor in determining the appropriate course of treatment and support but rather is combined with information on these other dimensions to determine the overall recommendation for the level of care for substance use treatment and support, including WMS.

Within the first dimension of the ASAM criteria for adults there are five "levels of care" for withdrawal management, organized largely by severity of withdrawal. The WMS levels of care are described and numbered as follows in Table 3. In making the connection to the levels of WMS in the Canadian national NBP model, Levels 1 and 2 would correspond roughly to Community Non-Residential WMS; Level 3.2 and 3.7 would correspond roughly to Community Residential WMS, depending on the nature and extent of medical supports available; and Level 4 would correspond roughly to Complexity-Enhanced Hospital-based WMS.

Table 3. ASAM benchmark withdrawal management levels of care for adults

ASAM Level of Withdrawal Management for Adults	Level	Description
Ambulatory Withdrawal Management ***without*** Extended On-site Monitoring (Outpatient Withdrawal Management)	1-WM	Mild Withdrawal
Ambulatory Withdrawal Management ***with*** Extended On-site Monitoring (Outpatient Withdrawal Management)	2-WM	Moderate Withdrawal
Clinically Managed Residential Withdrawal Management (Residential Withdrawal Management)	3.2-WM	Moderate withdrawal requiring 24-hour support
Medically Monitored Inpatient Withdrawal Management	3.7-WM	Severe withdrawal requiring 24-hour nursing care, physician visits as needed
Medically Managed Intensive Inpatient Withdrawal Management	4-WM	Severe, unstable withdrawal requiring 24-hour nursing care and daily physician visits

Severity of symptoms, is however, only one of several criteria noted in the literature for community versus inpatient WMS (see for example, Muncie et al., 2013; Perry 2014). Multiple failed attempts at community WMS is also a commonly cited indication for inpatient WMS, as well as multiple episodes of any detoxification process, given evidence for what is known as the "kindling" hypothesis. The so-called kindling effect refers to the experience whereby repeated episodes of untreated alcohol withdrawal results in a progressive increase in neuronal excitability and sensitivity after each episode. This can lead to successively more severe episodes of withdrawal, including possible progression to withdrawal seizures and delirium tremens (DTs; Lejoyeux, Solomon, & Adès, 1998).

There are several examples of research syntheses and guidelines that offer criteria, or conversely, contraindications, for community, non-bedded WMS for alcohol or non-specific substance use/addiction. For example, a recent systematic review of community/home WMS for alcohol dependence found the following to be the most commonly applied criteria supporting community WMS (Nadkarani et al., 2017):

- Availability of another person in the home who is able to care for the person (including medication management)
- A safe home environment
- No other substance use in the home
- Consent from a general practitioner

In translating the available research to the Canadian context, the College of Family Physicians of Canada (2012), in collaboration with the Canadian Centre on Substance Use, provided the following contraindications to non-residential alcohol withdrawal management:

- History of withdrawal seizure or withdrawal delirium
- Multiple failed attempts at outpatient withdrawal
- Unstable associated medical conditions (e.g., coronary artery disease, insulin-dependent diabetes mellitus)
- Unstable psychiatric disorders (e.g., psychosis, suicidal ideation, cognitive deficits, delusions or hallucinations)
- Additional sedative dependence syndromes (e.g., benzodiazepines, gamma-hydroxybutyric acid, barbiturates, opiates)
- Signs of liver compromise (e.g., jaundice, ascites)
- Failure to respond to medications after 24–48 hours
- Pregnancy
- Advanced withdrawal state (e.g., delirium, hallucinations, temperature greater than 38.5°)
- Lack of a safe, stable, substance-free setting and caregiver to dispense medications

Similar indications and contraindications are reported in other reports including those from Canada (British Columbia Ministry of Health, 2017; Kahan, 2015), the UK (NHS Grampian, 2017; National Institute for Healthcare Excellence (NICE), 2020; Swain, Krause, Laramee, & Stewart, 2010; Western Health and Social Care Trust, 2014); Australia (Davis, 2018; Government of South Australia, 2012); New Zealand (Matua Raki, 2012); and Ireland (Ana Liffey Drug Project, 2016a; Ana Liffey Drug Project, 2016b).

Importantly, while many criteria are consistently identified in this literature, no reports specify which among the range of indications are essential to ensuring patient safety and positive outcome. Thus, considerable emphasis is also placed on flexibility in applying the matching criteria, with a strong focus on individualized, client-centred decision-making, including a role for well-informed client choice. The literature is also sparse with respect to considerations for many minority and marginalized groups, or those with special needs, for example, Indigenous peoples, LGBTQ+ communities, older adults, those living with unstable housing, individuals with co-occurring acute or chronic conditions, and individuals who are pregnant. These are all important sub-populations for which a patient-centered, age- and sex/gender-appropriate, and culturally sensitive approach will be needed (see also section 9.0).

The literature on withdrawal from opioids also emphasizes the role of outpatient service delivery models unless strongly indicated otherwise, for example, the BC guidelines on opioid use disorders (British Columbia Centre on Substance Use and B.C. Ministry of Health, 2017). This literature is complicated, however, by the clear evidence for the risks associated with opioid withdrawal in general, given decreased tolerance after tapering, and the risk of overdose upon relapse. The BC guidelines also note that individuals who wish to avoid long-term opioid agonist treatment can be slowly tapered in a supervised fashion on an outpatient basis rather than rapid inpatient opioid-agonist taper. UK guidelines on opioid detoxification (National Institute for Healthcare Excellence (NICE), 2007) suggest a community-based program as the first-line option for opioid withdrawal with the following as potential exceptions:

- No or limited benefit from previous formal community-based detoxification
- Need for medical and/or nursing care because of significant comorbid physical or mental health problems
- Need for complex poly-drug detoxification, for example concurrent detoxification from alcohol or benzodiazepines

- Experiencing significant social problems that will limit the benefit of community-based detoxification.

Importantly, opioid treatment guidelines are also unequivocal in their recommendations that withdrawal management without immediate transition to long-term evidence-based treatment has been associated with a variety of elevated risks, including but not limited to risk of relapse and overdose. For example, national guidelines recently released by the Canadian Research Initiative on Substance Misuse (2018) recommends that "offering withdrawal management alone (i.e., detoxification without immediate transition to long-term substance use/addiction treatment) should be avoided, since this approach has been associated with increased rates of relapse, morbidity, and mortality." (p. 21). This recommendation is not dissimilar to that made for withdrawal from alcohol or other drugs, such that WMS alone is not considered an effective treatment option on its own (see section 4.2.1 below for more discussion of the continuum of services and need for comprehensive post-WMS supports).

There is also emerging evidence regarding the role of telemedicine in the delivery of substance use services. A review conducted by Young (2012) identified 50 studies of multiple-contact (i.e., three or more) telemedicine interventions involving over 30,000 individuals seeking support for a substance use disorder in the United States, Europe and Canada. Half of the studies analyzed were randomized controlled trials. Telemedicine included a range of platforms such as internet (e.g., websites, email, chat, web conferencing), telephone, telephone interactive voice response (IVR), text messaging, videoconferencing and electronic monitoring. A clear finding from the review was very active participation in telemedicine by a minority of participants. While many individuals with more severe substance use problems rarely or never used telemedicine services, a small number made frequent and extensive use of the service. Those who did avail themselves were generally supportive; some studies reported specific satisfaction with respect to the convenience, comfort and privacy that telemedicine offers. The majority of studies (61%) reported positive substance-use related outcomes and no studies reported any increases in substance use. Only about a third of the studies considered impacts on resource utilization, the majority of whom reported positive outcomes.

Telemedicine also has a role to play in withdrawal management. Ghodsian et al. (2018) conducted a feasibility study involving four clients diagnosed with a range of substance use and mental health issues who were enrolled in an outpatient concurrent disorder day treatment program. These clients received

WMS delivered through telemedicine, which included videoconferencing several times daily, peripheral monitoring of blood and blood oxygen and access to medications through a local pharmacy. All clients completed the treatment within 7 to 11 days with only mild withdrawal symptoms and no medical or psychiatric complications. The clients reported satisfaction with the service, and in particular its ease, convenience and readily available support.

Telemedicine has also been studied in the context of aftercare supports for individuals transitioning from withdrawal management services. Timko et al., (2019) compared follow up supports delivered through enhanced telephone monitoring versus usual care (i.e., an offer to make a referral to a substance use/addiction treatment services) for individuals transitioning from inpatient WMS for alcohol or opioid use. At 3-months follow-up, individuals who received the telephone monitoring were less likely to have accessed subsequent WMS but were no more likely to have accessed outpatient substance use/addiction treatment or self-help supports. No differences between the groups were found at 6-month follow-up. Overall the results suggest that telephone monitoring, which in this study represented a low-cost and low-intensity intervention, may help reduce repeated admissions to WMS over the short-term.

The available literature on WMS is also not confined to the question of community ***versus*** inpatient WMS, that is, as either/or options. Mixed models have also been evaluated with a recent study by Quelch et al. (2018) being a good example. These investigators compared two options: (1) "usual care" for an emergency department visit for intoxication, comprised of stabilization and referral to an acute medical unit of the hospital and with no community follow-up upon discharge; and (2) a more elective inpatient option comprised of a quick discharge from the emergency department to an outpatient team of substance use specialists who, based on an assessment of severity of withdrawal symptoms, refer to either an inpatient WMS service or community outreach and support. While the inpatient WMS option was recommended for those deemed unsuitable for community WMS, such as individuals with no social support, those with significant comorbidities, and/or those with a history of alcohol withdrawal seizures, it was always followed by active community engagement and support. Results were clear in showing the value of the elective option for inpatient WMS combined with community support in reducing repeat admissions to the emergency department for acute intoxication. The main message from this and many other studies is the value of assessment combined with the very judicious use of inpatient resources,

and the importance of community-based options for follow-up and support. Clearly, unplanned admissions to acute medical units following a presentation to an emergency department for intoxication was shown to be an ineffective method of maintaining long-term abstinence in clients with severe alcohol use disorder, as 100% of the clients routinely managed with "usual care" were readmitted for the same condition within the follow-up period, and often on more than one occasion.

All this being said, the overall weight of research evidence, as reflected in the most recent guidelines and standards, points to the important and growing role for non-residential WMS options for the large majority of individuals in need of WMS and a corresponding trend away from "low threshold" residential options. In Canada, this is perhaps best reflected in the recent British Columbia guidelines (B.C. Ministry of Health, 2017), whereby only a minority of people seeking support for withdrawal from alcohol and/or other drugs are said to require intensive medically monitored or medically managed services.

A recent systematic review of community-based WMS options (Nadkarani et al., 2017) noted that despite the need for residential WMS options for select individuals experiencing withdrawal from alcohol and/or other drugs, interest remains high in non-residential options given evidence regarding their increased accessibility and effectiveness, comparatively lower cost, and perceived acceptability of these options for many individuals (e.g., those working). Interest is especially high for models that involved collaborative care between community, hospital and primary care. It is noteworthy, however, that despite these and other benefits, the authors noted ongoing skepticism among general practitioners for engaging in community-based WMS (see section 7.0).

In conclusion, a range of community and hospital-based WMS options are needed and supported by research. In many respects, the key question for planners and policy makers is not whether to support certain evidence-based options over others, but rather what is the appropriate ***combination*** of these options for the communities they serve. This is the aim of the national NBP model project which, as a general guideline for planning and resource allocation, assigns a relative weighting for the required capacity of the various WMS services based on severity and complexity of the individuals comprising these communities. In the national NBP model, the general population aged 15 and over is categorized into five levels of severity and complexity based on population health data on substance use/addiction,

co-occurring mental and physical challenges and other factors. For people aged 26-64[5], the proportions requiring ***any*** WMS service are 70%, 30%, 10% and 2% for severity tiers 5, 4, 3 and 2, respectively[6]. Within each of these groupings, the proportions requiring each level of WMS are shown Table 4. That is to say, of the proportion of the population in Tier 5 requiring WMS (which is 70% of total Tier 5), 30% are estimated to require Complexity-Enhanced Hospital WMS and 60% Community Residential. Thus, even at this high level of severity and complexity, the majority are projected to be safely supported in less intensive, non-hospital-based services, but with some built in medical supports.

Table 4. Proportion of people aged 26-64 considered appropriate for each of the four levels of WMS in the national NBP model

Severity Tier in the NBP Model and Percent Requiring ANY WMS	%[7] Acute Intoxication	%[5] Community Non-Residential WMS	%[5] Community Residential WMS	%[5] Complexity-Enhanced Hospital WMS
Tier 5 (70%)	25	5	60	30
Tier 4 (30%)	60	40	10	10
Tier 3 (10%)	75	25	5	5
Tier 2 (2%)	100	0	0	0

[5] The NBP estimates are slightly different for three age groups – 15-25, 26-64 and 65+.
[6] See Appendix C for the criteria underlying severity tiers
[7] These percentages are based on those needing <u>any</u> WMS, not the total population in the severity tier category.

4.2 Evidence-based principles

In addition to support for a range of WMS options according to level of need, the research literature also points to a variety of key principles that should be adhered to within the various options. For example, in the Canadian context, British Columbia's bio-psycho-social-spiritual guidelines for WMS (B.C. Ministry of Health, 2017) advocate the following key principles:

- Person-centred
- Accessible
- Respectful
- Culturally safe and culturally centred
- Recovery-oriented and wellness-focused
- Trauma-informed
- Strengths-based
- Informed by the principles of harm reduction
- Committed to reducing stigma
- Family-centred
- Part of a continuum of integrated care

Below we highlight four cross-cutting principles particularly salient to health system planning, as reflected in the literature and emphasized in the feedback provided by our key informants:

- Stepped care approach and integration with a broader continuum of services
- Importance of screening, assessment and triage
- Provision of comprehensive supports
- Evaluation, performance measurement and continuous improvement

4.2.1 Stepped care and integration with a broader continuum of services

A strong cross-cutting theme across virtually all recent literature and related guidelines is the need for WMS to be well-integrated into the broader continuum of services. In other words, positive long-term outcomes are dependent on what happens after withdrawal management, such that this initial phase of a comprehensive WMS service is only one potentially beneficial layer towards establishing a trajectory of improved wellness (Goheen, 2013). This key principle cuts across the literature on WMS services for alcohol (Kahan, 2015; National Institute for Healthcare Excellence (NICE), 2020; NHS Grampian, 2017; Swain et al., 2010; Western Health and Social Care Trust, 2014); opioids (Canadian Research Initiative on

Substance Misuse, 2018); methamphetamine (Grigg et al., 2018); and other literature that is undifferentiated by substance (B.C. Ministry of Health, 2017; Matua Raki, 2012; NSW Department of Health, 2008).

This core principle is consistent with the prevailing view that substance use disorder, especially when characterized by high severity and complexity, is a chronic relapsing health condition typically requiring multiple treatment experiences and close monitoring and follow-up. The tiered framework is highly salient in these discussions (National Treatment Strategy Working Group, 2008), and advocates for multiple pathways into and through a continuum of services based on the provision of the least intrusive and most cost-effective option for each individual seeking help. No matter the entry point, the individual engaged in the treatment system is stepped up or stepped down to the level and intensity of services and supports based on the recovery-related outcomes that are targeted.

"The problem is that we've disconnected WMS from treatment centres physically. Having these systems all separated out causes lots of people to fall through the cracks. In a way, this separation has created a kind of sieve for motivation—by doing this weeding out [of less motivated individuals], you are changing the probability of a good outcome. But then the bulk of people who have an addictive disorder don't end up getting any care. They don't qualify because they are not meeting the high criteria for entry."

Stakeholder perspective

The achievement of positive outcomes associated with the provision of monitoring and continuing care is widely supported in the substance use/addiction literature *writ large* (Chi, Parthasarathy, Mertens, & Weisner, 2011; MacKay, 2005). For example, individuals are significantly more likely to keep intake appointments scheduled within one day of contact in comparison to three and seven days later (Festinger, Lamb, Marlowe, & Kirby, 2002). Such timely transitions are particularly important for WMS (as research has shown that a lengthy transition time from WMS to treatment can lead to the loss of engagement with a client (Manning et al., 2017)). For example, intervals ranging from several days to weeks can result in up to 30% of clients leaving and not progressing into treatment (Li, Sun, Marsh, & Anis, 2008). Indeed, a timely transition (i.e., within a few days) between WMS and treatment services is a key indicator of

service quality in performance measurement frameworks for substance use services (Garnick et al., 2011; Lee et al., 2014; Stein, Kogan, & Sorbero, 2009).

> *"When we think about how to best prevent those kinds of worst-case outcomes [in WMS], we really need good objective scores that can reasonably guarantee withdrawal not escalating over a 12-24 hour period. The COWS and CIWA are reasonable scores if done hourly."*
>
> Stakeholder perspective

This transition from WMS to treatment has been exacerbated by the historical separation of community residential WMS services and other parts of the continuum (see also textbox). Numerous interventions have been developed to facilitate this transition, including outreach visits by treatment staff, case management, incentives and escorts to treatment centres, as well as agency-level interventions like performance contracting (Carroll, Triplett, & Mondimore, 2009; Chih, 2013; Chutuape, Katz, & Stitzer, 2001; Haley, Dugosh, & Lynch, 2011; McLellan, Weinstein, Shen, Kendig, & Levine, 2005; Nielsen & Nielsen, 2018). With respect to case management, this may involve ongoing monitoring with either specialist substance use/addiction services or other community-based services such as primary care (Kahan, 2015). As will be discussed further below with respect to the NBP non-residential and residential WMS options (see section 5.2), continuity of care may involve transition from WMS to flexible, low intensity supportive recovery beds (referred to as "STAR beds"; see also section 5.2) while waiting for residential treatment, if required. WMS-related transitions may also involve active referral and coordination between different service sectors, for example, emergency departments and specialist substance use services (Duber et al., 2018; Quelch et al., 2018). Regardless of the approach, reducing delays from WMS to other services and supports is an important opportunity to improve recovery outcomes and overall quality of care.

4.2.2 Importance of screening, assessment and triage/referral

Closely linked to the need for multiple WMS options, with their respective inclusion and exclusion criteria, and the stepped care approach generally, is the importance of screening, assessment and triage/referral to the appropriate level of WMS. Critical to this process is the assessment of withdrawal symptom severity, accomplished with evidence-based assessment and rating scales - most commonly the Clinical Institute Withdrawal Assessment for Alcohol, revised (CIWA-Ar: Sullivan et al., 1989) and

Clinical Opiate Withdrawal Scale (COWS; Wesson & Ling, 2003). See sections 6.1.2 and 6.2.2 for more details on these and other alternative assessment tools for alcohol and opioids. Through a Quebec-based key informant, we also learned about a clinician-administered severity and risk assessment scale for the purposes of WMS placement that has been developed by researchers and clinicians in that province and used for many years. It is currently in the process of being validated and updated to include more substances than alcohol (e.g., benzodiazapines, opioids, methamphetamine) and to provide more guidance on indicators for placement in hospital, community, or home WMS options.[8]

One of our key informants with a background in addiction medicine referenced two stages of assessment: the first phase undertaken to determine whether or not the person meets criteria for a diagnosis of substance use disorder and their corresponding level of care needed (e.g. inpatient, daytox); and the second stage upon initiation of the WMS service itself. The first stage should include details around substance use such as consumption history, risks associated with poly-drug use, past history of withdrawal and any associated complications, and current substance use in the home. For opioid use disorder specifically, this initial phase of assessment must also include an assessment of risks associated with loss of tolerance following withdrawal (National Institute for Healthcare Excellence (NICE), 2007).

The second stage of assessment is more focused on ongoing monitoring of symptom severity and other medical and psychosocial factors, as needed. Some recommendations are quite specific with respect to the duration of the symptom monitoring phase, particularly for non-residential home - based WMS, for example, daily review by a general practitioner or nurse for at least the first four days (Davis, 2018).

[8] A second project is soon to be underway in Quebec to develop a tool that will assess the risk of immediate substance-related medical complications (i.e., beyond withdrawal specifically), and for application in a wide variety of medical and non-medical settings. The purpose is to predict significant deterioration of people in the next hours. When completed it will also be relevant for risk assessment in both medical and non-medical WMS settings.

"The value of having a stabilization period attached to post detox is that fewer individuals will face barriers when arranging access to residential treatment beds or services, they will be in a safe and drug free environment, they will engage in opportunities to meet with other professionals as required, and they will be monitored by staff that may assist in further treatment planning activities. In summary, less individuals fall through the cracks or relapse following detox, because in most cases they are not being discharged "onto the streets" while awaiting a treatment bed. This is the basis for improved treatment planning, flow between systems, less relapse potential, increased retention and positive outcomes for the individual, once they have been admitted to treatment beds or other services."

Stakeholder perspective

These staged processes highlight the need to think of screening and assessment as a continuous process tailored to the particular circumstances, needs, and preferences of the individual seeking help. Furthermore, structured assessment tools should be complemented with an experienced narrative approach that is non-judgmental and which includes motivational interviewing, is culturally sensitive and is delivered with empathy (B.C. Ministry of Health, 2017). Special considerations may need to be made for some translation services and availability of appropriate liaison staff (e.g., different ages, gender, culture). The overall approach combining both quantitative and narrative-based feedback must also be trauma-informed as well as age and gender/sex informed and include considerable room for collaborative decision-making with inter-disciplinary team members, the individual seeking help and involved family members and other loved ones.

Depending on the substance, symptom severity and WMS setting, a wide variety of other areas of the individual's current and past situation needs to be covered in the screening and assessment process. Some areas such as biological health indicators (e.g., blood pressure, blood count, liver function) and mental health co-morbidity (e.g., psychotic symptoms, level of distress, potential for self-harm) should be routinely covered, as well as psychosocial areas such as housing stability, employment and financial status, social support, and criminal activity. A signed patient contract may also be helpful, especially in the context of community/home-based WMS, to set clear boundaries and expectations, for example, concerning urine testing, not driving under the influence of alcohol and/or other substances, and continuing care plans (Davis, 2018).

4.2.3 Need for comprehensive supports

In order to meet the three goals of WMS (see section 3.0), and closely related to the consistent call for a stepped and integrated approach for WMS, the research evidence and related guidelines call for a broad range of supports within and wrapped around the WMS process. Meister et al. (2018) summarize research showing that people with repeated admissions to WMS tend to be more socially marginalized, with high rates of unstable housing and unemployment (Callaghan, 2003; Callaghan & Cunningham, 2002b; McLellan et al., 2005), as well as present with poly-drug use and blood borne infections (Li et al., 2008). These findings speak to the need for tailored psychosocial supports to accompany pharmacological and medical care in WMS settings.

United Nations/World Health Organization treatment standards (United Nations Office on Drugs and Crime & World Health Organization, 2017) advise against rushed detoxifications from alcohol, citing a robust evidence base to suggest that they are ineffective and counter-productive as they are likely to lead to immediate relapse. Detoxification should be planned as part of a structured treatment plan, and should put emphasis on aftercare treatment for short-term relapse prevention and longer-term support through mutual aid groups and other support services as appropriate.

With respect to opioid use disorder, there is some debate about the role of psychosocial supports above and beyond opioid agonist treatment (OAT) specifically. Firstly, it is important to reiterate that withdrawal from opioids significantly raises the risk of severe consequences due to loss of opioid tolerance and, if implemented at the request of the individual, should be done with a slow taper and accompanied by a clear and well-monitored plan for follow-up support services (Canadian Research Initiative on Substance Misuse, 2018; see also section 6.2). Secondly, recent national guidelines (Canadian Research Initiative on Substance Misuse, 2018) also suggests that in uncomplicated patient populations, the addition of

> *"We want to make sure [our service delivery model] has lots of good programming, seven days a week and on a drop in basis for folks who aren't ready to attend the full day structured program, but maybe can attend 3 days a week or five half days a week — so flexible programming. We [also] heard on our site visits how important family support and involvement are."*
>
> Stakeholder perspective

structured psychosocial treatment interventions to OAT does not improve treatment outcomes compared to standard OAT with clinician-led medical management (i.e., general support and unstructured clinician-led counselling). What is often not recognized, however, is that this does not suggest that pharmacotherapy should be offered in isolation, but rather that clinician-led medical management ***includes*** ongoing assessment, monitoring, and support for all aspects of physical, emotional, mental, and spiritual health, as these remain equally important components of treating opioid use disorder.

Regardless of the substance, severity of withdrawal and WMS model deployed, a variety of factors related to the social determinants of health and potential mental health issues can influence overall recovery (Amato et al., 2013; Kassani, Niazi, Hassanzadeh, & Menati, 2015). This calls for a range of flexible responses to individual needs and strengths and a corresponding spectrum of staff skills and competencies (see section 9.0). Further, like screening and assessment, individual treatment and support services must be culturally sensitive/safe, individualized, person/family-centered, and conducted with the individual and family preferences and input in mind. These individualized services should also be of sufficient duration and intensity to maximize the likelihood that motivation and behavioral change will be consolidated and internalized. While the duration of treatment and support services necessary to reach this point is highly individualized, international standards note that individuals who stay at least three months in treatment usually have better outcomes (United Nations Office on Drugs and Crime & World Health Organization, 2017)

A variety of alternatives have been examined to support transition to and from WMS to other treatment and support services. This includes Internet/mobile based applications (Chih et al., 2013; Lucht et al., 2014; Tofighi et al., 2017); agency-level financial incentives and electronic reminders (Acevedo et al., 2016; Acevedo et al., 2018); pre-WMS planning and motivational assessment (Kouimtsidis, Sharma, Charge, & Smith, 2016; Ostergaard et al., 2018). Collaborative care models such as Rapid Access to Addiction Medicine (RAAM) clinics can also facilitate flow to and from WMS (Corace et al., 2019). See also Timko et al. (2015) and Timko, Schultzc , Britt, & Cucciare (2016) for evidence reviews of patient and program factors that bridge the WMS-treatment gap.

One challenge in the planning and provision of post-WMS support services is the limited availability and accessibility of these services in many communities, especially in rural and remote communities.

Considerable research suggests inadequate capacity for WMS and related services in rural areas (Grigg et al., 2018; Lenardson et al., 2009) and that more reliance must be placed on informal community resources for treatment services following WMS. Telephone and Internet-based supports may also be helpful, depending on connectivity challenges as well as availability of health services for prescribing, dispensing and monitoring purposes (see also section 9.0).

4.2.4 Health Equity

Health equity refers to the "fair distribution of resources needed for health, fair access to the opportunities available, and fairness in the support offered to people when ill" (Whitehead, & Dahlgren, 2006, p. 5). While not identified as a specific area of focus for this review, a brief overview of health equity is included in this report given its prominent consideration in the research literature, service guidelines/standards and stakeholder feedback, and reflecting its important implications for the delivery of accessible and effective WMS. It is important to emphasize, however, that the intent is not to provide a comprehensive review of all health equity issues for all populations; rather examples are provided to emphasize the importance of taking health equity into consideration when planning for WMS services.

> *Individuals with opioid use disorder have many comorbid medical and mental health conditions, and face a range of structural and social difficulties. As such, it is crucial to establish health care implementation science mechanisms to promote action on opioid use disorder on several fronts and monitor the progression of the opioid emergency response across the country in the short- and long-term. To this end, it is paramount to develop a multidisciplinary and actionable care roadmap to improve clinical care strategies (i.e., address wait times for treatment and linkage to care), and strengthen the integration of care and research across the public health and clinical domains.*
>
> Canadian Research Initiative on Substance Misuse, 2018, p. E255

The most common population that stakeholders described that is vulnerable to health inequities is individuals living in rural and remote regions where there is often limited access, not only to WMS, but to the full continuum of substance use, mental health and other health and social supports. Stakeholders described how this presents a significant barrier to accessing timely and appropriate supports on several fronts, including financial (e.g., to pay for transportation to and from services outside the region), social

(e.g., disconnections from family and social networks) and safe access (e.g., managing the medical, psychological and behavioural complications of withdrawal while in transit to care). This report presents a number of options to address these barriers, including increasing capacity to manage withdrawal in the primary care setting (see section 7.0), expanding WMS service delivery models to include community/home-based withdrawal management supports (see section 5.0) use of telemedicine and other technology to extend the reach of services and expertise (see sections 4.1), and workforce training and development to enhance cultural sensitivity and minimize stigma and discrimination in service delivery (section 8.2).

British Columbia's bio-psycho-social-spiritual WMS guidelines (B.C. Ministry of Health, 2012) provides a particularly comprehensive overview of health equity issues for other populations who experience disproportionately high levels of harm associated with substance use, trauma, and/or discrimination; and/or face specific barriers to accessing services. Highlights are provided below:

- *Women* (see also Greaves and Poole, 2007 for a comprehensive overview)
    - more likely to experience a greater intensity and range of negative medical, psychological and social impacts associated with substance use
    - often have a history of sexual and physical violence; experience more barriers related to child care responsibilities, poverty, and housing insecurity
    - benefit from women-only services
- *Pregnant women*
    - face additional stigma related to their substance use, including self-stigma, which may be a barrier to accessing prenatal care and/or substance use treatment
    - benefit from a strengths-based approach to enhance feelings of self-worth and value
    - require specific policies and procedures for priority admission to WMS services, opportunities for extended stay as needed, access to prenatal care and education about the impacts of substance use on fetal development, and supports to access community health and social services upon discharge from WMS[9]

[9] As noted in earlier sections, access to addiction medicine specialists is particularly important when delivering medical withdrawal management supports for pregnant women.

- *Older adults*
    - are at increased risk of a complex range of biological, psychological, and social factors that may contribute to, trigger, or complicate problematic substance use patterns, including death of a spouse, close friend or family member; chronic health issues; loss of identity, status or self-worth following retirement; isolation, reduced mobility, and diminished social supports; a history of psychiatric disorders; and financial difficulties;
    - are at increased risk of the harmful effects of substance use
    - there is a lack of consensus in the research literature regarding the benefits of age-specific treatment services
    - often require more time in withdrawal management, as well as more intensive care and ongoing monitoring than younger adults
- *Lesbian, gay, bisexual, two-spirit, transgender or questioning (LGB2STQ) individuals*
    - are at a disproportionate risk for problematic substance use, often due to experiences of stigma and discrimination
    - may have greater mental and physical health needs
    - benefit from LGB2STQ responsive WMS services, including access to services delivered by LGB2STQ staff[10]
- *Individuals of Indigenous heritage* (see also Allan & Smylie, 2015 for a comprehensive overview of health equity issues)
    - experience significant barriers to service due to stigma and discrimination, geographic location, jurisdictional complexities, and a lack of culturally appropriate services
    - require services that are culturally appropriate, as applicable, and that integrate a focus on mental, physical, emotional and spiritual health and that support the use of traditional medicines, practices and initiatives
    - may benefit in particular from home-based WMS as a more comfortable and beneficial environment for withdrawal given the challenging and traumatic historical relationship with government institutions
- *Individuals with physical or sensory disabilities*
    - frequently face barriers to access to residential WMS facilities and may benefit from home-based models of care; may require special assistance with overcoming psychological barriers to accessing WMS

[10] One stakeholder from British Columbia specifically identified the lack of services for transgender clients in the province

- *Individuals with cognitive disabilities*
    - are more likely to have a negative experience with mainstream services
    - may require service providers to adapt their style and forms of communication
    - benefit from specialized assessments to identify and address specific psychosocial needs (e.g., self-care, coping strategies, communication, learning, social skills, and planning and decision-making)
- *Survivors of intimate partner violence*
    - require recovery plans that address their short- and long-term safety
    - may require access to specific supports, including childcare and family counselling, both during and following withdrawal management

Outreach has also been identified as another important mechanism by which to mitigate some of these barriers for specific population groups (Schultz, Martinez, Cucciarec, & Timko, 2016). One Canadian study (Deering et al., 2010), found that a mobile outreach program in Vancouver's downtown eastside (an area notorious for having a high concentration of marginalized and vulnerable individuals with a range of health and social issues, including precarious housing, poverty, health inequities and substance use and mental health problems), reached a high proportion of female sex workers. Use of this service in the previous six months was also found to be associated with a four-fold elevated proportional odds of using inpatient substance use/addiction treatment (including withdrawal management services). Mobile outreach teams have also been implemented in British Columbia, including a team dedicated specifically to Indigenous communities, and has reportedly resulted in positive outcomes.

Agencies planning WMS programs may also consider using tools at a program and/or organizational level to identify and address health equity issues. For example, the Ontario Ministry of Health and Long-Term Care's Health Equity Impact Assessment (HEIA), is a decision support tool that "*walks users through the steps of identifying how a program, policy or similar initiative will impact population groups in different ways. HEIA surfaces unintended potential impacts. The end goal is to maximize positive impacts and reduce negative impacts that could potentially widen health disparities between population groups*." (Ministry of Health and Long-Term Care, 2008). And guidelines produced by the Jean Tweed Centre, a community-based substance use treatment agency for women and their families in Toronto, provides guidance and indicators regarding trauma-informed practice at the organizational and system levels (Jean Tweed Centre, 2013).

4.2.5 Evaluation, performance measurement and continuous improvement

Another core principle noted fairly consistently in WMS guidelines and related research, and voiced by many of our key informants, is the need to commit to ongoing monitoring, evaluation and quality improvement. This echoes recommendations across the substance use/addiction sector generally for performance measurement and quality improvement (Health Quality Ontario, 2018; Health Quality Ontario, 2019; Urbanoski, Inglis, & Veldhuizen, 2019) as well as recommendations for implementation science mechanisms to improve clinical care strategies (e.g., reduced wait times to treatment, linkage to care) and strengthening of the integration of care and research across the public health and clinical domains (Canadian Research Initiative on Substance Misuse, 2018). Both the British Columbia WMS guidelines (B.C. Ministry of Health, 2017) and the Ontario WMS Standards (Addictions and Mental Health Ontario, 2014)[11] explicitly advocate for continuous program improvement and evaluation for WMS. Evaluation requirements for WMS may be reflected in broader guidelines for treatment services generally, as in the BC *Service Model and Provincial Standards for Adult Residential Substance Use Services* (B.C. Ministry of Health, 2011) or the *UNODC* 2017 *International Standards for the Treatment of Drug Use Disorders* (Draft for Field Testing; United Nations Office on Drugs and Crime & World Health Organization, 2017)). Some of the specified outcome requirements that would be appropriate for WMS include:

- Resolution of withdrawal symptoms
- Understanding of the substance use disorder and related problems
- Motivation to engage in follow-up treatment after discharge
- Improvement in physical and mental health, and initiation of treatment and/or discharge plans to handle such problems over the long-term
- Improvement in craving for substances and beginning development of skills to control triggers (thoughts, emotions, and behaviours) that lead to substance use

Process related indicators appropriate for all services, including WMS would include:

[11] The Ontario standards are currently under review and a revised version is expected to be released in the near future.

- Regular opportunities for participants to provide feedback on program activities and interventions
- Regular opportunities for other service providers who link with the program to provide formal feedback
- Programs participate in regular contract monitoring and reporting procedures with the health authority
- Service providers participate with health authorities in regular program and outcome-based evaluations

Other possible performance indicators are very specific to WMS services, including an important one among the widely used indicators from the work of the Washington Circle requiring timely transition between WMS and treatment services (Garnick, Horgan, & Chalk, 2006; Garnick et al., 2011).

5.0 Canadian stakeholder perspectives on WMS models

Table 5 shows a preliminary estimate of the number of different types of WMS programs in Canada operational as of 2016. Clearly, the majority are Community Residential WMS, and consistent with the definitions provided below, many have varying degrees of medical supports either in-house or easily accessible. Importantly, the table also shows, however, the significant number of Community Non-Residential WMS options—a total of 60 if one counts separate satellite locations of central services (e.g., locations in different cities or towns within a specific region served by one organization). A smaller number of Complexity-Enhanced Hospital-based WMS are operational[12] and a smaller number still of specialized Acute Intoxication Services.

Table 5. Estimated number of WMS in each of the Needs-based Planning Model Categories in Canada, 2019

	Acute Intoxication Services	**Community Non-Residential Services**	**Community Residential Services**	**Complexity Enhanced Hospital Services**
Number of Withdrawal Management Services	7	43 (60)[1]	92	23

[1] If satellite locations of the same organization are included, the total number of non-residential WMS is 60. A small number are affilitated with residential services offering both options.

[12] Five of the services in this category, or about 25%, are in New Brunswick.

5.1 Acute Intoxication Services

Definition: These services provide safe, short-term monitoring and management of symptoms resulting from of an episode of heavy alcohol and/or other drug use that can't be managed at home. The length of stay can be relatively brief; typically less than 24 hours depending on individual circumstances. This service is offered to clients that do not have an apparent medical or psychiatric condition necessitating emergency interventions.

Examples include: Sobering centers, stabilization units, short-term admissions to community residential WMS

One of the three goals for WMS (see section 3.0) is to manage the medical, psychological and/or behavioural complications arising from ceasing to use one or more psychoactive substances. This represents the initial "detoxification" phase of a more comprehensive process to transition an individual to treatment and longer term recovery (a second goal). This must also be done in a safe and humane environment (the third goal). These goals raise an important question for health system planners of substance use/addiction services, namely how best to safely support those individuals who express no interest in engaging in subsequent treatment, including those whose current situation is highly predictive of continued heavy alcohol and/or drug use. It is widely recognized that a significant number of admissions to emergency departments for substance-related reasons, especially those that are alcohol-related, involve people in this situation. Many are homeless and, if not brought to an emergency department, are arrested for so-called "public intoxication" or "public drunkenness" and are taken to jail.[13] Police may use discretionary judgement as to whether the hospital or jail is the optimal response;

[13] **Public intoxication**, also known as "**drunk and disorderly**" and **drunk in public**, is a summary offense in some countries rated to public cases or displays of drunkenness. Public intoxication laws vary widely from jurisdiction, but usually require some obvious display of intoxicated incompetence or behavior disruptive/obnoxious to public order before the charge is levied. Specific laws and regulations are determined at the provincial/territorial level in Canada https://en.wikipedia.org/wiki/Public_intoxication

no doubt this is somewhat jurisdiction-specific. Interestingly, in the 1960s and early 1970s, a community-based, "non-medical" residential detoxication service was widely implemented in Ontario, the main criteria for local funding of these centres was documentation of a certain number of community arrests for public drunkenness per 1000 population. It was only later that these so-called "social model" detoxification centres evolved broader goals related to treatment transition and preparedness (Ogborne & Smart, 1982).

> *"The WMS centre here has become more of a sobering centre: a turnstyle door for people who are homeless and predominantly service crystal meth [issues]; making it really unamenable for other clients. We can't get past the model because that's what they need."*
>
> Stakeholder perspective

This history in Ontario is important as it highlights what remains today as a potential tension within the overall goals of WMS – namely, managing public intoxication in a humane way (i.e., in a way more humane than an overnight stay in jail) and facilitating treatment motivation and transition. This was highlighted by a stakeholder who expressed the opinion that the community was being "held hostage" by the old social model detoxication centre, given the high percentage of clients who need and access this short-stay support for acute intoxication, but whose (often recurring) demand for the service limits the capacity to serve other clients who are ready to benefit from a program environment that will also support their transition to treatment. Indeed, community residential WMS often report a certain percentage of so-called "revolving door clients".

It is in response to this tension that some jurisdictions have developed specialized acute intoxication services that are typically referred to as "sobering centres". Several factors lie behind the growing interest in these services including the increase in homelessness in many communities and the prevalence of heavy alcohol and drug use in this population, combined with highly variable interest in seeking help at the present time (Kauppi, Pallard, & Faries, 2015; Rush, 2019) as well as the recognition of the high costs and limited effectiveness of repeated emergency department admissions, and the increasing acceptance of harm reduction as an over-riding principle for treatment system design and service delivery.

The sobering centre model is most widely implemented at the present time in British Columbia (Meister et al., 2018). In the model implemented in the Fraser Valley Health Authority, the length of stay is up to 23 hours; multiple admissions are allowed including walk-ins; separate rooms with floor mats are provided for men and women with close monitoring; the location is in close proximity to a large hospital; staffing includes nurses and health care workers (although physicians will come if an acute emergency presents); and a clinical counsellor is available to offer support for accessing treatment if appropriate to the situation. A high percentage of service users are chronic repeaters which has resulted in marked measured decreases in local emergency admissions for alcohol intoxication as well as high satisfaction expressed by local police services (personal communication, Mumford, S.).

> *"The intent of a sobering center is to address the problem of acute public inebriation. Sobering centres perform more of a life safety function than a rehabilitation function."*
> Stakeholder perspective

In Winnipeg, a 20-bed acute intoxication service, operates as a provincial IPDA or Intoxicated Persons Detention Act facility. Admissions are primarily through Emergency Medical Services (EMS), although police can drop people off. People sleep in separate, small rooms on mats with minimal services provided. The maximum stay is 24 hours, although most leave after around 10 hours. The main challenge experienced in the Winnipeg site arises from those presenting intoxicated on crystal methamphetamine, given the frequency of psychotic symptoms and extreme agitation. These individuals are considered not suitable for this setting and the province is developing alternatives, including specially designed "pods" in selected emergency departments.

In sum, these low threshold sobering centres are attracting attention due to their focus on harm reduction and apparent impact on reducing emergency department admissions for acute intoxication. The Winnipeg experience also highlights one of the challenges of this service delivery model, namely the need for screening and access to medical emergency support. In addition, the repeat use of these facilities by the chronically homeless population points to the need for more stable housing solutions for a significant percentage of the population who current utilize such facilities.

5.2 Non-residential Withdrawal Management Services

Definition: This service involves voluntary withdrawal management in a client's home or other safe accommodation via on-site visits or web-based support. It may also involve visits to a central location (e.g., substance use/addiction program, "safe home" in the community) during the day, while returning home at night. This service may involve varying levels of medical management and supports, including assessment by a physician and/or other qualified health care worker(s) as well as regular monitoring support. Before the client is "discharged", case workers work collaboratively to assist the client and/or those supporting the client to connect to post-withdrawal management services (e.g. assessment and treatment planning, treatment, housing, other supports).

Examples include: Mobile WMS teams, Internet-facilitated, non-residential WMS program sponsored by a hospital or community provider, including Daytox and collaborative models.

As noted above in the research review of community non-residential (outpatient) and residential (inpatient) WMS options (see section 4.1), the overall weight of research evidence, and as reflected in the most recent WMS guidelines and standards, points to the important and growing role for non-residential options for the large majority of individuals in need of WMS. Key elements include screening and assessment to determine the appropriateness of this level of WMS (see section 4.1 for indications and contraindications), provision of service in the home or another safe environment, and varying levels of medical supports. Because of the need for the latter, it is inappropriate to refer to community non-residential options as "non-medical" services. Research has shown that these programs are most effective and beneficial for clients who

The typical client [of non-residential WMS] might be psychosocially more stable…would have a safe home environment and a reliable individual supporting them. A stereotypical case would be 20 year old male with an alcohol use disorder and no seizure history; who is otherwise healthy and staying with his folks. You could have VON [Victorian Order of Nurses] come in—they can connect you with a prescriber remotely; it's just a CIWA protocol. That would just be one element of the person's addiction treatment. There would be a door into more intensive treatment. He might have to travel to get to a day wellness program or, if needed, an inpatient unit.

Stakeholder perspective

are assessed regularly as not in danger of seizures due to their use patterns, history, type of drugs used (alcohol for example) or who are not experiencing any other serious physical life-threatening withdrawal symptoms. Certain populations respond favourably to this model, including First Nations/Indigenous people, women, particularly those with childcare needs, older adults, youth, people with medical conditions such as HIV, and people with various disabilities. Indigenous people in particular may benefit from community non-residential WMS options (Brett, Lawrence, Ivers, & Conigrave, 2014).

"The social versus medical [tension] is odd because when I hear people refer to a lack of medical WMS, they completely forget the programs we have—which is nurses and a nurse practitioner who now practice addiction medicine in the community."

Stakeholder perspective

Cost savings to the health care system have been a key factor behind the interest in, and growth of, community non-residential WMS. Fleeman (1997), in his review of the literature on home WMS models and programs, notes that while early studies done by Stockwell et al. (1990) and Cooper (1995) suggest that the development of home WMS programs created more demand than did inpatient WMS, this trend would still be more cost-effective since a nurse specialist could visit three to four times as many individuals a day than would be seen in an inpatient unit (Cooper, 1994). Reaching clients at an earlier stage would also provide an opportunity to further reduce costs along the treatment continuum as fewer individuals should develop chronic drinking or drug use issues. While noting that more research is required, Fleeman concludes that literature has shown that as long as the necessary precautions are taken in terms of screening and assessment, home WNS is not only safe, but clinically effective and cost effective for the vast majority of people who require it. This conclusion is echoed by the most recent systematic review (Nadkhari et al., 2017).

In the Canadian context, and reflecting the literature more broadly, there are several ways in which community non-residential services have been implemented. Generally speaking, models may be based

on "out-reach", characterized, for example, by a mobile team and/or use of telemedicine[14], as opposed to "in-reach" such as a daytox approach. Combinations are also possible in multi-functional services. Outreach options, in particular, can significantly increase access to WMS, especially for people with transportation challenges or others who might not otherwise get the services and supports needed (see also section 4.2.4).

Home/Mobile teams: The Fraser Valley Health Authority in British Columbia has the most diverse continuum of WMS in that province, if not in Canada as a whole. This includes the Riverstone mobile team that is funded to better meet the needs and concerns of clients including:

- Stigma/labelling
- Childcare / family responsibilities
- Transportation issues
- Lack of privacy
- Fear of institutional settings
- Medical issues, HIV, or other complex issues

Overall, the model fosters a harm reduction approach, and also involves the family and community, which cannot be accommodated in a 24-hour residential WMS.

The region served by Riverstone is divided into three large areas, one of which is more heavily populated with rural and remote communities, including Indigenous communities. Each standard team is comprised of a trained health care worker, with specific training in core substance use/addiction practice and other areas as available, as well as a nurse (either a registered nurse (RN) or a registered practical nurse (RPN)). Physicians are contracted and are available about three hours a day, Monday to Friday. Some physicians are engaged with Riverstone directly for contract work, while some run health clinics in the various communities served. The physicians do the initial assessment—often a full

[14] See, for example, the TC LHIN-funded urban telemedicine Withdrawal Management pilot project led by Toronto East General Hospital (TEGH) - https://hospitalnews.com/telemedicine-pilot-improves-withdrawal-management-care/

physical—and then discuss clients' situations with the team and direct them to the appropriate interventions. There are separate Indigenous teams that must include a masters-level social worker or substance use/addiction counsellor, plus a nurse. The Indigenous teams go to all reserves/ communities in the east region. If the Indigenous bands have a safe house on their band, the clients can go there, otherwise they can go to STAR beds.

STAR beds, or Short Transitional Access to Recovery Beds are a central component of the Riverstone mobile WMS model. Each Riverstone mobile team has access to 6 male and 6 female STAR beds via agreements with provincially licensed facilities to support the acute detoxification phase for an average length of stay of 5-8 days, and with eligibility to extend stays for an additional 30-day stabilization period. This provides an opportunity to arrange for residential treatment and other post-WMS services while waiting in a safe and drug-free environment, thereby reducing the risk of relapse. Thus, each of the Riverstone regions has access to low or no cost accommodation (e.g., a family member's home, short term stabilization beds or STAR beds, shelter beds, women's transitions houses) for those whose living situation is currently not conducive to home WMS. Transportation is an important aspect of providing services, whether it is to deliver services to clients or deliver clients to services. Evaluation data has shown that the Riverstone community mobile WMS teams have been very successful in reducing acute care hospital admissions and associated costs related to intoxication.

WMS within collaborative multi-functional services: There is a trend to embed the WMS mobile team within a multi-functional, hub-based service model that includes drop in services, assessment, access to counselling and navigation supports and which may bring together a range of community partners. In Winnipeg, a new mobile team is working out of a primary care clinic affiliated with a larger organization that provides a diverse range of services and supports, including, for example, a crisis line, and telephone, on-line and drop in counselling. In this example, a mobile team goes out to the person's home following, for example, a walk-in assessment done at a RAAM clinic (see below) or by another substance use/addiction provider. The outreach team is comprised of an addiction-trained physician, an experienced nurse, and a social services worker. After eligibility is determined, the nurse or the worker will meet the client in the home or in another safe environment that has been arranged (e.g., a family member's home, Fraser Health short term stabilization beds or STAR beds, shelter beds, women's transitions houses). Plans are underway to expand the mobile team model in Manitoba.

In London, Ontario, after trying to build a home model exclusively through telehealth technology (using the Ontario Telemedicine Network (OTN)), the community's largest community treatment service has now incorporated more nursing supports directly into the front end of their assessment and treatment planning process, including for its walk-in intake services. This includes assessment and triage with a validated screening tool for withdrawal symptoms and then arranging support for community WMS. This approach to embedding WMS into more multi-functional, community-based substance use/addiction services and supports is also being considered as a way to increase access to WMS in Nova Scotia. The idea would be to develop "withdrawal management assessment and support hubs", co-located with other functions, such that people can drop-in and get an assessment and initial treatment plan and have access to whatever immediate supports they might need, including community WMS if appropriate, as well as flexible programming and navigation. In addition to improving access, the aim is for improved ***flow*** across a range of hospital (i.e., acute care, emergency department) and community partners.

"It turns out it would be a rare event that folks were not able to go home within 8 hours (most do); if not, then 12 hours. In most areas are offering outpatient [WMS], less than a handful in a year who would require an overnight stay for medical reasons"

Stakeholder perspective

The Rapid Access to Addiction Medicine (RAAM) clinics are another collaborative model that can include close linkage to WMS. The RAAM clinics have been shown to reduce emergency department visits (Corace et al., 2019) and are being widely implemented in Ontario and Manitoba (META:PHI, n.d.). A RAAM clinic is a low-barrier, walk-in service where clients can get help for a substance use disorder without an appointment or formal referral. RAAM clinics provide time-limited medical substance use/addiction care (including pharmacotherapy, brief counselling, and referrals to community services). These RAAM clinics are based on a drop-in model, and are variously staffed by addiction medicine physicians, nurses, substance use/addiction counsellors, social workers and other support workers, including system navigators. There is quite a bit of variability in the operationalization of the RAAM model and many have close relationships with hospital emergency services such that people can be diverted quickly for specialized substance use services and supports. The focus of attention is often on opioid use disorder as the RAAM model provides quick stabilization on opioid agonist treatment with a view to gradually

transitioning the person to ongoing supports through primary care services. The RAAM clinician provides ongoing support by being available to primary care providers for re-assessments, consultations, and advice about substance use/addiction management. For alcohol use disorder, the RAAM model significantly increases access across a wide range of severity, including the full spectrum of needs for WMS. In Ottawa, for example, the RAAM clinic accepts clients on a walk-in basis, or directly from the emergency department and it is closely affiliated with the hospital-based WMS service for those needing this level of care (about 10-15%). However, a significantly larger percentage of clients with alcohol use disorder are supported in withdrawal on an outpatient basis, with daily access to medication, most commonly diazepam and lorazepam. Follow-up support is also provided for system navigation and transitions to other community services as needed.

Day Programs: Currently, in Nova Scotia, considerable attention has been drawn to many aspects of the success of the Addictions Wellness Clinic affiliated with the Fishermen's Memorial Hospital in Lunenburg. This program functions as a "daytox" service with low threshold, open-access via drop in or referral. Despite the focus on withdrawal management, it is currently framed as a "wellness service" as it offers considerable supports beyond the acute phase, including unlimited post-WMS drop-in services. The acute phase for alcohol (the most common substance) is managed largely with benzodiazepines. People return home after the first day and return the next and subsequent days. It was reported that this offer to return is key to engaging clients, even for a cup of coffee and conversation. In contrast, people served by the old, more traditional, WMS model, which typically discharged clients after 7-10 days, reported feeling abandoned since they would then have to wait for three months for community-based follow-up. Under the new WMS model, people proceed directly to day programming and can continue until they determine themselves that they no longer require this form of support. It was noted that the length of time needed for medical supports was very short and that most could be managed in this day program. Evaluation of the new model was also said to have shown a significant reduction in acute care admissions and longer intervals between relapse rates of chronic clients.

The Centre for Addiction and Mental Health (CAMH) in Toronto offers a more traditional WMS day program, operating 9 am to 4 pm, Monday to Friday and designed to treat individuals experiencing less severe or intense withdrawal. Clinical eligibility dictates program suitability. The program is staffed with an RN and an RPN, and a physician is available every day. The most common substances for which

management is needed are alcohol and opioids and these require regular (hourly) monitoring of withdrawal symptom severity. Results dictate next steps which may be discharge home with medication, transfer to CAMH emergency services, or transition to inpatient WMS if a bed available. If needed, those discharged home will return the next day– in extreme circumstances they may return for up to 5 days. Many clients in the day program are known and have already been assessed, and many have been attached to the CAMH outpatient service for some time and are already followed by a physician, and will continue to be followed upon discharge. This familiarity reportedly increases the confidence in the safety and appropriateness of the next steps for the client.

Challenges: Despite the considerable enthusiasm for home/mobile WMS services, stakeholders also offered several cautionary concerns about these models. Echoing the research literature, stakeholders stressed the importance of ensuring medical supports are embedded in the model, including back-ups for medical emergencies such as ambulance and emergency services. Regarding home alcohol WMS, for example, the literature suggests daily review by a general practitioner or nurse as important for at least the first three or four days (Guidelines and Protocols Advisory Committee, 2013). Additionally, one of our project stakeholders, an addiction medicine specialist, cautioned that there is a need for considerable experience and understanding of the community and local population context, during and following screening and assessment for medication management. He noted that "*CIWA and COWs are distorted relative to the skill of the provider doing the test. If you look at the CIWA – it includes a lot of subjective reporting. They are fundamentally flawed, when it comes to [lack of] objectivity".* For some people, gaining access to non-residential WMS services can signal ready access to medication such as benzodiazepines or slow release morphine, thus highlighting the need for careful and experienced substance use/addiction assessment and triaging.

Another concern related to client safety, not only in the home generally, but also during transfer to services; for example, consideration regarding what equipment is needed in a vehicle to keep clients safe in the event of a medical emergency, especially in remote communities where cellphone service may be very limited. The safety of staff was also an expressed concern, particularly in the context of providing services in a client's home or even just travelling on the road.

Accessing transportation, including related financial support for transportation to a community non-residential WMS, was also considered to be a challenge. For the day program in Nova Scotia, which

operates in a rural area, challenges were identified for some clients related to the daily return travel requirement.

Interestingly, other stakeholder comments regarding the challenges in that model reflected the aforementioned potential tension between the WMS goals regarding supporting chronic substance users with little or no current motivation for treatment and those clients interested in moving on to treatment. While the post-WMS drop-in support services were seen as particularly helpful for individuals with chronic substance use, some challenges were expressed in moving clients through to steps of more active treatment.

Some stakeholders commenting on the role of telehealth for remote communities, where such access is possible, noted the potential challenges related to equipment set-up and training, intermittent poor connectivity and getting used to delays to communication during conversation. Reflecting on the role of telehealth for WMS specifically in remote First Nations communities, the need for local support for medication management, including storage was noted (e.g., in health centres in First Nation communities).

5.3 Community residential withdrawal management services

Definition: These services involves voluntary withdrawal management in a non-hospital residential setting. While they are typically sponsored or otherwise administratively linked to a hospital for quick access to medical emergencies, the services themselves are largely non-medical in nature. That being said, this model may involve a medical assessment by a physician, and monitoring by a nurse or other health care worker, during the withdrawal process to provide medical management and support as needed. The intensity of the monitoring may vary by setting. Withdrawal can be supported with or without medication management. Before the client is "discharged", case workers work collaboratively to assist the client and/or those supporting the client to connect to post-withdrawal management services (e.g. treatment, housing, other supports).

Examples include: Community-based WMS with some low to -moderate intensity in-house medical supports, designated beds for initial phase of community residential treatment or for transition to non-residential treatment and support

As reviewed above in section 3.0, the research evidence clearly supports the need for "inpatient" WMS, for selected people in need of withdrawal services and supports. This is further reflected in regional, national and international guidelines. In the research literature, however, the distinction is not clearly drawn between community-based and hospital-based inpatient services. In Canada, the community-based, so-called "social detox" model, arose from seminal research of the (then) Addiction Research Foundation in Ontario and spread across many jurisdictions of the country (see also section 5.1). The model ensured access to medical supports by requiring organizational sponsorship of the program by a hospital, thereby facilitating access to an emergency department and other acute services when needed. That being said, the staffing model did not include any medical professionals. In other parts of Canada, and British Columbia in particular, the community (i.e. non-hospital-based) WMS always had a strong medical component, including nurses and physicians. The Creekside WMS, as an example, is fully staffed 24/7 by nurses (RPNs and RNs), health care support workers, and contracted physicians. Clients are seen daily by a physician, who also does routine medical reviews as well as addresses any emerging medical issues, including determining whether or not needs are too high-level for community residential

and require transfer to hospital. Clearly, this is a long distance from a "non-medical/social detox" program and substantially different from the norm in Ontario and other Canadian jurisdictions.

Hospitalization should be reserved for those who need it, and based on stakeholder input as well as the national Needs Based Planning model, this is clearly a minority of the individuals requiring withdrawal management supports.

Although no formal study has been undertaken recently of the national profile of community WMS, it is safe to say that while this variability with respect to integration of medical supports remains, there is a trend toward building more medical supports—for example, with in-house nursing staff and contractual relationships with physicians (such as through sessional fee structures). This trend is no doubt related to the higher levels of need/complexity of people presenting for WMS, as well as increasing cost pressures on hospitals to maximize the use of their beds. In short, and consistent with a stepped care approach, if the individual can be safely supported in a community context, whether residential or non-residential, this will be the more cost-efficient and effective approach. Hospitalization should be reserved for those who need it, and based on stakeholder input as well as the national NBP model, this is clearly a minority of the individuals requiring withdrawal management supports.

In addition to the trend toward increasing the level of medical supports in community residential WMS services, another trend highlighted by stakeholders is to incorporate WMS as an initial phase of community residential treatment; that is linked and embedded in the same organization, with WMS and stabilization beds set aside, or using the same (flexible) bed capacity. This trend toward more integrated WMS/treatment services is also notable with respect to community non-residential WMS, as discussed above. Initiatives such as the development of RAAM clinics has also spurred an increasing integration and coordination of WMS services with other parts of the treatment system. Noteworthy examples were identified in Ottawa and in northern Manitoba.

Interestingly, in Quebec, this integrated approach has been the norm rather than the exception in building the provincial capacity for WMS, with only a small number of stand-alone WMS services, and withdrawal management a core function of most, if not all, of the province's public residential treatment services. There has also been a concerted effort in Quebec to establish formal linkages

between a community's emergency department and substance use treatment facilities, facilitated by nurse liaison staff working out of the emergency department but who are actually staff of the local substance use/addiction treatment service. The goal is to direct those people needing only a moderate level of withdrawal management support to residential resources in the community that have some nursing support. This can be the residential treatment facility itself or other options such as unused long-term care beds in the community. While the places used are quite variable, depending on the region, the aim is to have them near the hospital to facilitate transfer to acute care services if the need arises.

> *"The goal of the liaison nurse is to help emergency department rooms get these patients (in need of WMS] out of the ER. So you need these intermediate beds that are outside of the hospital into these moderate withdrawal services."*
>
> Stakeholder perspective

Challenges: The major challenge with the community residential WMS model that was noted by stakeholders was similar in many respects to that noted for community non-residential WMS, namely ensuring that an appropriate and readily accessible level of medical supports are available. This includes access to psychiatry and psychology supports, which may well be more challenging in many jurisdictions. Provincial fee structures and payment mechanisms may be a related challenge in ensuring medical and psychiatric supports and back-ups are available. Related to availability and accessibility of medical and mental health services is the need for an evidence-based approach to screening, assessment and triage to ensure this level of care is an appropriate match to the person's needs and strengths (see also section 4.4.2).

> *"We aren't supposed to be creating a [WMS] system where we are housing people because they don't have stable housing. We can't keep people for three months until they get housing."*
>
> Stakeholder perspective

Another challenge, reminiscent of the above discussion of sobering centres (see section 5.1), is the need for housing and shelter services for those for whom community residential WMS may be appropriate. Given the traditional, low threshold approach to accessing these

community WMS programs, and their historical role in managing public intoxication among people with chronic substance use/addiction challenges, it is widely reported that many frequent users of the community WMS may be using this service in the absence of other options for shelter. While from a community harm reduction perspective this can be appropriate for many individual circumstances (e.g., safety, frigid weather) it does speak to the need for community WMS to be examined from the point of view of a community-wide homelessness strategy. Balancing resources across all levels of WMS is an important part of system planning, including the value of low threshold, lower cost services for managing acute intoxication such as sobering centres.

5.4 Hospital/complexity-enhanced residential withdrawal management services

Definition: These services involve assistance with voluntary withdrawal management where care is provided within the structure of a health care setting with a high level of medical and psychiatric capability. This typically involves the use of designated hospital beds and medication management, for example, to assist with physical stabilization and withdrawal, and/or co-occurring mental disorders. Before discharge, clients are supported to connect with post-withdrawal treatment and support services (e.g., assessment and treatment planning).

Examples include: Medical WMS unit in hospital; Designated beds or bed/days as an initial phase of hospital-based residential treatment or for transition to community residential or non-residential treatment and support.

As noted above and in the earlier sections that review the research evidence (see section 4.1), there is unequivocal support for substance use/addiction treatment systems to include some capacity for this medically and psychiatrically enhanced level of WMS. While a range of indications are provided in various guidelines, or more precisely contraindications for community-based outpatient services, the guidelines do not specify the absolutely critical indications for this level of care, but rather present a picture of appropriate complexity both from a medical and psychosocial point of view. This is also complicated by the trend to build more medical supports into both community residential and non-

residential WMS. Therefore, determining when hospitalization is needed will depend on individual circumstances and informed by careful assessment as well as ongoing monitoring and capacity for well-oiled transitions to this level when required. Community context will also be important; for example, the prevalence of crystal methamphetamine use and addiction and concomitant psychotic, behavioural and physical sequalae. All this being said, and taking individual circumstances and clinical judgement into account, from the list of contraindications for outpatient services presented earlier, the following are likely the most salient as far as signaling the need for short-term, hospital-based WMS.[15]

- History of withdrawal seizure or withdrawal delirium
- Unstable associated medical conditions (e.g., coronary artery disease, insulin-dependent diabetes mellitus)
- Unstable psychiatric disorders (e.g., psychosis, suicidal ideation, cognitive deficits, delusions or hallucinations)
- Additional sedative dependence syndromes (e.g., benzodiazepines, gamma-hydroxybutyric acid, barbiturates, opiates)
- Signs of liver compromise (e.g., jaundice, ascites)
- Failure to respond to medications after 24–48 hours
- Pregnancy
- Advanced withdrawal state (e.g., delirium, hallucinations, temperature greater than 38.5°)

Across Canada, there is, no doubt, considerable variation in the services that are provided, and associated staffing mix, in this complexity-enhanced level of WMS. Ontario stakeholders referred to these services as "Level 3 WMS"; essentially medical, hospital-based services that are similar in many respects to a designated psychiatric unit in a hospital. There are only four of these services in the province of Ontario. Generally speaking, medical consultation and nursing staff are available 24/7 to monitor and manage withdrawal severity and medical conditions, including any risks associated with

[15] The local capacity for medical supports within existing community residential services would also have to be taken into account

pregnancy. Access to psychiatry and psychology is also standard. Internal capacity exists in at least two of the Ontario facilities (probably others as well) for evidence-based opioid withdrawal or OAT stabilization as well as withdrawal support for complex benzodiazepine use disorders. If there for OAT stabilization, clients are not permitted to leave the unit, and typically stay for seven days. Alcohol withdrawal is less strict and is often for those that tried to unsuccessfully to stabilize in the community.

There was general agreement among stakeholders that only a small number of people needing support for withdrawal management require this enhanced medical level of service. This is consistent with the expert opinion and results of the national Needs-based Planning model (Table 4). In the day wellness program discussed earlier in Nova Scotia (see section 5.3), it was reported that only a very small percentage (less than 1%) of the 7000 case presentations required hospitalization; these included, for example, those with severe cardiac signs or negative indicators in blood work. For the RAAM clinic in Ottawa, the percentage referred on for medical WMS at the same hospital was about 10-15%, a higher percentage than the Nova Scotia day program, likely due to the nature of the population already accessing the RAAM service. Regardless of the source of the feedback, the percentage deemed as needing this level of WMS is low, and lower than commonly thought. The percentage does, however, vary by population (e.g., is no doubt higher for those with methamphetamine use disorder); the access point in the system for the population of interest (i.e., the previous filter in the stepped care model); and community context with respect to health conditions and social determinants of health such as housing.

"We we have a number of WMS units in the province, many of which only provide medically supervised withdrawal and no aftercare. [And yet] all the literature ays that it's a useless intervention as a stand alone treatment. They are expensie units: all nursing led and hospital based with unionized staff, etc. The average census across the province four our units runs between 35 and 50%. Imagine any other domain of health care where any units less than half full [would be acceptable]."

Stakeholder perspective.

Another factor relevant to the level of WMS brought to our attention by stakeholders was the need for regional, if not provincial, planning as to the strategic location of these high intensity, and therefore, costly resources. The prevailing view was to consider these resources as covering a regional catchment area, for example, one stakeholder noted

"*probably going to end up with three units distributed across province; for clients more treatment refractory and complex".*

Challenges: As with community residential WMS, there needs to be a rigorous evidence-based process in place for screening, assessment and triage to ensure this level of care is an appropriate match to an individual's needs and strengths. Costs are a driving factor in funding and operating these resources and they need to be managed wisely in a clearly articulated and accountable stepped-care model. There also needs to be an appropriate workforce that is available and sustainable to implement the required interventions (see also section 8.0); availability of psychiatric services may be particularly challenging in some areas. This speaks to the need for regionalizing these resources which can, in turn, raise its own challenges, specifically, transportation for client access and family support and transition challenges back to services and support in the home community. Experience elsewhere also points to a challenge in ensuring a designated regional resource is in fact "open for business" for individuals from outside the usual service delivery boundaries of a hospital. Provincial, as opposed to regional, level planning, coupled with accountability mechanisms may be needed to ensure equitable access to everyone in a designated catchment area.

Lastly, we mention again the issue of housing and shelter supports and the need to ensure adequate options are available in the community. Given the cost of these hospital-based resources, it is critical that they not be used in a revolving cycle of admissions and re-admissions largely as a replacement for temporary shelter.

6.0 Evidence-based treatment approaches

As noted earlier, it is important to re-emphasize that the effectiveness of any WMS will be influenced by the relative emphasis on pharmacological strategies (using medications to help manage withdrawal), psychosocial strategies (using cognitive, counselling and/or psychosocial supports), or a combination of both approaches. Since pharmacological strategies are largely substance-specific, each sub-section below presents a brief overview of the specific substance, withdrawal syndrome, and evidence-based approach to management. We give less attention here to psychosocial aspects of WMS, not in any way to diminish their importance, but rather to acknowledge the commonalites of psychosocial treatment and supports across the substances. For example, there should always be a focus on motivational interviewing and counselling, as required, and attention to social determinants such as housing and food access. Any approach used should be tailored to the needs of the individual and may combine pharmacological and psychosocial strategies. A post-withdrawal approach to treatment and support may also include pharmacological approaches to relapse prevention, for example, in the case of alcohol and the use of acamprosate and naltrexone.

6.1 Alcohol

Alcohol is a central nervous system depressant. In small amounts, alcohol produces a euphoric state and relaxation. At higher concentrations, it leads to acute intoxication and depression of brain function—common signs of which include slurred speech, poor body coordination, loss of inhibition, and, at extremely high levels, loss of sensation, difficulty breathing and death. These effects are caused by an imbalance between excitatory (glutamate) and inhibitory (gamma-aminobutyric acid, or GABA) neurotransmitters. Short-term alcohol use depresses brain function by tipping the balance toward GABA's inhibition of the central nervous system. Long-term exposure to alcohol has the opposite effect: the brain attempts to restore balance by decreasing GABA's inhibitory actions and increasing glutamate's excitatory effects. This contributes to tolerance to alcohol whereby more alcohol is needed to produce the same short-term effects on the brain (Valenzuela, 1997).

6.1.1 Alcohol withdrawal syndrome (AWS)

When constant or heavy alcohol use stops abruptly, so too does its inhibitory effects on the brain, tipping the balance towards excitability or overactivity of the central nervous system. The result is alcohol withdrawal syndrome (AWS), a condition characterized by a cluster of distressing symptoms, including anxiety and agitation, nausea, hand and body tremors, gait disturbances, nausea, and, in severe cases, hallucinations, seizures and delirium tremens (DT). AWS is diagnosed based on two conditions: 1) clear evidence of cessation or reduction in heavy and prolonged alcohol use and 2) symptoms of withdrawal that are not accounted for by a medical or other mental or behavioural disorder. With respect to the latter, neuroimaging is recommended to rule out other neurological conditions, especially in the case of first onset seizures (Jesse et al., 2017). AWS usually manifests 1-3 days after the last drink of alcohol.

6.1.2 Assessment

The prevalence of alcohol withdrawal in the general population is low (Caetano, Clark, & Greenfield, 1998) and many individuals can safely manage the symptoms of AWS without medical supports. For more serious cases, however, some medical supports are required; for example, it is estimated that individuals admitted to a general medical hospital with a history of heavy alcohol use have between a 2% and 7% chance of developing severe AWS (Wood et al., 2018). Accurately predicting the risk of developing AWS ensures that the right level of care is provided, including timely prophylactic management. The Prediction of Alcohol Withdrawal Severity Scale (PAWSS) is a relatively new screening tool that has been found to accurately predict AWS in medically ill individuals (Maldonado et al., 2015). It is comprised of 10 items that require patient interview and measurement of clinical signs to complete. Despite the superiority of the PAWSS relative to other screening tools (Wood et al., 2018), it is not widely used in Canada, a particular concern given the tendency of medical services to admit people presenting with serious alcohol misuse to inpatient WMS programs when less-intensive services would be more appropriate (Coulter, 2018).

Recently, Benson and colleagues (2018) have also focused on identifying and stratifying the risk of alcohol withdrawal among hospital (emergency department) patients so as to divert individuals at low risk to a more appropriate WMS and other social and psychological supports. The score on the Glasgow

Modified Alcohol Withdrawal Scale (GMAWS), combined with hours since last drink, the Fast Alcohol Screening Test (FAST) and systolic blood pressure correctly identified 89% of individuals who developed full alcohol withdrawal syndrome and 84% of individuals that did not.

Following diagnosis, the Clinical Institute Withdrawal Assessment-Alcohol, revised (CIWA-Ar) is one of the most commonly used tools to assess the severity of AWS. The CIWA-Ar is a 10-item scale derived from the 15-item CIWA-A, which was developed and tested at the former Addiction Research Foundation (now CAMH) in Toronto, Ontario. The CIWA-Ar was found to be valid and reliable for a voluntary population being treated in a WMS context (Sullivan et al., 1989). A recent study, however, failed to replicate these results for acutely ill or injured hospitalized individuals (Higgins et al., 2019), despite its common use in general hospital settings. It is also not effective in differentiating delirium due to other causes, raising the question of its appropriateness in hospital settings serving acutely ill individuals with complex co-morbidities (Bostwick & Lapid, 2014).

Relatedly, a recent study exploring the appropriate use of the CIWA-Ar in a general hospital setting found that that CIWA-Ar protocol was not followed in the majority of cases, either due to failure to document AWS risk factors; completion of the tool with individuals whose ability to communicate is compromised; and/or lack of provider awareness of the CIWA-Ar order (Eloma et al., 2018). Another study (Hecksel, Bostwick, Jaeger, & Cha, 2008) found that, in a sample of patients in a general hospital who were treated for AWS, more than half (52%) did not meet inclusion criteria for the instrument and 44% received treatment even though they had not had a recent history of drinking. Given these limitations, studies have supported the use of other assessment tools that rely less on patient response, such as the Sedation Agitation Scale (SAS; Sen et al., 2017), which was found to be effective and efficient in assessing the severity of AWS symptoms in place of the CIWA-Ar scale for critically ill patients in an intensive care unit who had limited ability to communicate.

6.1.3 Management

Benzodiazepines

Benzodiazepines are considered the first-line treatment of AWS (College of Family Physicians of Canada, 2012; Substance Abuse and Mental Health Services Administration, 2015; World Health Organization, 2012). Benzodiazepines help to modulate central nervous system overactivity by binding GABA to GABA-A receptors, thereby replacing the repressive effects of alcohol that has been abruptly discontinued (Jesse et al., 2017). A large systematic review found that benzodiazepines are superior to both placebo and anti-convulsant drugs in the management of AWS seizures. They were not found to be superior to other drugs for the management of other AWS symptoms (Amato, 2010). Another review raised concerns, however, that there has not been a sufficient number of women represented in studies to reveal potential gender differences in their efficacy (Agabio et al., 2016). Further, while one benzodiazepine has not be found to be more efficacious than another (Amato et al., 2010), diazepam is considered the primary choice, because of its rapid onset to control agitation symptoms and its long action to avoid breakthrough symptoms (College of Family Physicians of Canada, 2012; Jesse et al., 2017). Shorter-acting benzodiazepines, such as Lorazepam, are recommended for older individuals and those with cirrhosis or severe liver dysfunction (World Health Organization, 2012; Jesse et al., 2017).

Prescribers typically employ one of the following dosing strategies:

- Front-loading – Treatment starts with high doses of benzodiazepines to achieve quick initial sedation, with subsequent tapering. Front-loading with diazepam has been shown to reduce the risk of complications and duration of withdrawal symptoms and is associated with lower total required dose of benzodiazepines (Jesse et al., 2017)
- Symptom-triggered - Dosage is determined based on a regular assessment of client symptoms and is not indicated for clients with a history of withdrawal seizures. Similar to front-loading, the symptom-triggered strategy is associated with shorter duration of AWS and lower overall dose of benzodiazepines. This strategy also results in less sedation and has less risk of respiratory depression (Jesse et al., 2017).
- Fixed-dose – Specific dosages are dispensed at regular intervals. This approach is recommended in instances where it is not possible to assess withdrawal symptoms, for clients who will require

medication regardless of symptoms, such as for those individuals with a history of seizure or DT, as well as for those with co-occurring medical conditions and first onset seizures/status epilepticus (Jesse et al., 2017). The fixed dose strategy is recommended for physicians with less experience administering diazepam (College of Family Physicians of Canada, 2012).

Anticonvulsant agents

Anticonvulsant agents are also commonly used in the treatment of AWS, either in conjunction with benzodiazepines, or on their own. While a Cochrane review (Minozzi et al., 2010) did not find sufficient evidence in favour of anticonvulsants for the treatment of AWS overall, it did find limited support in favour of carbamazepine for the treatment of some symptoms of AWS compared to benzodiazepines. As with benzodiazepines, there is insufficient evidence regarding possible gender different in the response to these medications (Agabio et al., 2016).

Anticonvulsants are recommended in cases of intolerance to benzodiazepines (College of Family Physicians of Canada, 2012) and may be considered for mild withdrawal states due to lower potential for abuse and/or dependence and lower side effects, including sedation (Kattimani & Bharadwaj, 2013; Minozzi et al., 2010). Following an AWS seizure, the World Health Organization (2012) recommends the use of benzodiazeplines, and not anticonsultants, for the prevention of further seizures.

Antipsychotic agents

Animal studies have shown atypical antipsychotic medications to have some benefit in the reduction of AWS symptoms, particularly risperidone and quetiapine (Uzbay et al., 2013). A Cochrane review, however, found that benzodiazepines perform better than anti-psychotics for seizures (Amato et al., 2011). Because antipsychotics are associated with higher mortality due to cardiac arrythmia and a lowering of seizure thresholds, they should be used cautiously, especially during the early stages of AWS, when the risk of seizures is higher (Jesse et al., 2017). Antipsychotics are not recommended as a stand-alone approach in the management of AWS (World Health Organization, 2012), but may be considered as an adjunctive therapy to benzodiazepines in the late stage of AWS to treat refractory DT (Jesse et al., 2017; Kattimani & Bharadwaj, 2013).

Supplements

Wernicke's Encephalopathy (WE), an acute neuropsychiatric condition commonly seen in individuals who chronically misuse alcohol, results from brain cell damage due to chronic thiamine deficiency. Left untreated, WE can lead to irreversible short-term memory and an impaired ability to acquire new information. WE is treated with thiamine supplementation, which is safe, relatively uncomplicated to administer and effective (Thomson et al., 2002). Because of their higher risk of developing WE, oral thiamine supplementation is recommended for all individuals being treated for AWS (Jesse et al., 2017; World Health Organization, 2012). Parental supplementation is recommended for individuals at high risk of, or with suspected, WE (World Health Organization, 2012).

Magnesium deficiencies are also commonly seen in individuals being treated for AWS, although no causal relationship has been clearly demonstrated between the two (Jermain et al., 1992). A Cochrane review (Sarai et al., 2013) found insufficient evidence supporting the routine use of magnesium supplementation in the treatment or prevention of AWS and it is generally not recommended (Jesse et al., 2017; Kattimani & Bharadwaj, 2013).

6.2 Opioids

Opioids are a class of drugs that interact with opioid receptors on nerve cells in the body and brain and result in analgesia and euphoria. Opioids are either naturally derived from the opium poppy plant (e.g., morphine and heroin) or are synthesized in labs (e.g., hydromorphone and fentanyl). They are prescribed to treat moderate to severe pain, coughing, diarrhea, and addiction to other opioids. Because of their euphoric effects, opioids are highly addictive and tolerance develops quickly. At doses exceeding an individual's tolerance threshold, opioids cause slowed breathing which may lead to hypoxia, a condition resulting in insufficient oxygen to the brain, which can in turn, result in coma, permanent brain damage or death (National Institute on Drug Abuse, 2019).

Problematic patterns of opioid use can lead to opioid use disorder (OUD), a chronic and relapsing condition characterized by significant impairment and distress (Health Quality Ontario, 2018). OUD is a major driver of the opioid crisis that has spread across Canada in recent years (Canadian Research Initiative in Substance Misuse, 2018). In 2018, at least 4588 individuals died from opioid misuse, representing an increase of 34% since 2016. The vast majority of these deaths were accidental and over 76% (up from 54% in 2016) were associated with the use of fentanyl and fentanyl analogues, particularly potent synthetic opioids (Special Advisory Committee on the Epidemic of Opioid Overdoses, 2019.)

6.2.1 Opioid Withdrawal Syndrome

Opioid withdrawal syndrome occurs with the abrupt discontinuation or reduction of long-term prescription or illicit opioid use. The onset, duration, and severity of the syndrome depends on the specific drug, level of use, underlying medical conditions, and family history (Nuamah et al., 2019). Symptoms can manifest as early as a few hours following last use. Opioid withdrawal syndrome usually includes signs and symptoms of central nervous system hyperactivity, beginning with anxiety, agitation and restlessness. Without effective treatment, more acute withdrawal symptoms emerge, including increased resting respiratory rate, diaphoresis, yawning, lacrimation, rhinorrhea, mydriasis, and stomach cramps, piloerection (gooseflesh), tremors, muscle twitching, tachycardia, hypertension, fever and chills, anorexia, nausea, vomiting, and diarrhea (Duber et al. 2018). The first, or acute, phase of withdrawal is followed by a period of about six months of a secondary or protracted withdrawal syndrome, characterized by a general feeling of reduced well-being and measurable abnormal physiological

functioning. Strong cravings for opioids may also be experienced periodically during this phase (Gowing, Farrell, Ali, & White, 2016).

While the symptoms of opioid withdrawal syndrome are not typically life threatening, individuals with comorbid conditions, such as coronary artery disease, congestive heart failure, insulin-dependent diabetes mellites, epilepsy and liver failure, are at increased risk of death if withdrawal is not effectively managed. Furthermore, because symptoms are acutely distressing and extremely difficult to tolerate, many individuals will continue to use opioids to avoid withdrawal, placing them at increased risk of morbidity and mortality secondary to their opioid use disorder (Duber et al., 2018).

6.2.2 Assessment

Treatment of opioid withdrawal syndrome should begin with a thorough medical history and physical examination that is focused on the signs and symptoms associated with opioid withdrawal (Kampman & Jarvis, 2015). A recent scoping review (Nuamah et al., 2019) found that opioid withdrawal scales are the main instrument used to assess and quantify opioid withdrawal symptoms. Out of the 18 scales identified, the following three scales are the most widely used to evaluate opiate withdrawal symptoms:

- SOWS-Gossop (Gossop, 1990)– The SOWS-Gossop is a 10-item, patient-reported scale that has been found to be both valid, reliable and sensitive and includes concepts that are relevant to clients' experiences with opioid withdrawal (Vernon et al., 2016).
- *Clinical Opiate Withdrawal Scale* (COWS; Wesson & Ling, 2003) – The COWS is an 11-item clinician-administered scale assessing opioid withdrawal. It has been found to have sufficient sensitivity to detect mild opiate withdrawal (Tompkins et al., 2009). It is widely used, given its brevity and simplicity (Nuamah et al., 2019), and has been specifically recommended for emergency department settings (Duber et al., 2018).
- Clinical Institute Narcotic Assessment (CINA; Peachey & Lei, 1988) – The CINA is a validated 13-item clinician administered scale and was one of the first to measure both withdrawal signs (e.g., nausea, sweating) and symptoms (e.g., abdominal pain, muscle pain). It is limited, however, by the need for nursing support for administration, reliance on self-report for several items, and no fixed upper limit to the scale (Tompkins et al., 2009).

Nuamha et al., (2019) note several limitations of existing opiate withdrawal assessment scales, including their inability to characterize dynamic behaviour changes over time and across situations, reliance on subjective patient report, and inconsistencies across scales with respect to the criteria used for evaluation, and the mode, frequency and timing of their administration. They suggest that emerging non-invasive sensor technology that continuously monitors physiological changes could complement existing assessment practices and mitigate some of these limitations as well as offer the potential to extend monitoring outside of clinical settings.

6.2.3 Management

Medical withdrawal management

> "Withdrawal management alone is not an effective nor safe treatment for OUD, and offering this as a standalone option to patients is neither sufficient nor appropriate".
>
> *CRISM (2018) clinical guidelines for opioid use disorder*

Medical management of opioid withdrawal syndrome involves the provision of gradually tapering doses of either opioid or alpha2-adrenergic agonists, along with other non-narcotic medications, to reduce withdrawal symptoms (Comer et al., 2015). While these approaches have been shown to be more effective than placebo in reducing the severity of withdrawal symptoms and drop-out rates, most clients relapse to opioid use if treatment is not linked to long-term substance use/addiction treatment (see also the next section).

Further, because withdrawal management lowers tolerance to opioids, these clients are then at increased risk of fatal overdose when they do return to opioid use (Canadian Research Initiative on Substance Misuse, 2018). Medically supervised withdrawal management is also not recommended during pregnancy due to similar high rates of relapse and increased risk of adverse outcomes that are more severe and longer-lasting than those associated with neonatal abstinence syndrome (NAS; Canadian Research Initiative on Substance Misuse, 2018). For these reasons, recent national

guidelines[16], released by the Canadian Research Initiative on Substance Misuse (2018), included a clear message that "**withdrawal management alone is not an effective nor safe treatment for OUD, and offering this as a standalone option to patients is neither sufficient nor appropriate**" (p.36).

Clients should be clearly informed of these risks and encouraged to consider other treatment options. For those that still choose withdrawal management, it is recommended that a slow taper (> 1 mo) be conducted in an outpatient or residential treatment setting, rather than a rapid (< 1 wk) taper, and with close and ongoing follow-up with the outpatient provider, when feasible, to ensure that longer-term opioid agonist treatment (OAT; see below) is offered. For pregnant women, gradual withdrawal management should take place between 14 and 32 weeks gestation and followed by intensive long-term monitoring and support (Canadian Research Initiative on Substance Misuse, 2018). To reduce the risk of overdose, clients and families should also be provided naloxone kits and overdose prevention and rescue education (Canadian Research Initiative on Substance Misuse, 2018).

Keeping in mind the limitations noted above, and particularly the high rates of relapse to opioid use, following medical management of opioid withdrawal syndrome, the following pharmacotherapies have been found to be effective in managing opioid withdrawal symptoms (see also next section):

- *Methadone* – Methadone is a long-acting synthetic opioid agonist that can "block" the euphoric effects of opioids, thereby relieving the user of the need or desire to seek opioids. It was first used as a tapering agent to treat heroin dependence and was later used for the purposes of treating opioid withdrawal symptoms (Amato et al., 2013). A systematic review (Amato et al., 2013) comparing methadone to other common pharmacological agents used to treat opioid withdrawal syndrome found that methadone did not differ from buprenorphine and adrenergic agonists (described below) in terms of treatment completion, sustained abstinence, severity of

[16] CRISM notes that much of the available research evidence that informed the development of its guidelines involved patients with moderate to severe OUD, and often with a history of injection heroin use, and that there is need for more studies focused on patients with mild OUD, as well as patients with prescription opioid dependence, who may have fewer comorbidities and may not require intensive pharmacological treatments.

withdrawal symptoms and adverse events. This review was limited, however, by significant heterogeneity with respect to the assessment of outcome measures in the trials reviewed.

- *Buprenorphine* – Buprenorphine is a partial agonist with a relatively long duration of action. It produces limited withdrawal signs and symptoms when discontinued, making it an appealing option for individuals recovering from opioid use disorder (Banys et al., 1994). Buprenorphine is now commonly administered in combination with naloxone, a drug that temporarily blocks the effects of opioids, thereby reducing the risk of recreational and inappropriate use. A systematic review (Gowing, Ali et al., 2017)[17] found buprenorphine and methadone to be equally effective in terms of withdrawal management treatment duration and completion. Because of homogeneity across studies, it was not possible to do a meta-analysis to compare buprenorphine and methadone in terms of other outcomes but individual studies were suggestive of their having similar capacity to alleviate opioid withdrawal, without clinically significant adverse effects. There is some evidence of differing patterns of the severity of withdrawal symptoms between the two agents with severity occurring earlier in treatment for buprenorphine, compared to methadone, which typically occurs at the end of the taper. Buprenorphine was found to be superior to clonidine or lofexidine (alpha2-adrenergic agonists) with respect to withdrawal severity, treatment retention and treatment completion. While no differences were found with respect to adverse effects, dropout rates due to adverse effects may be more likely with clonidine.
- *Alpha2-adrenergic agonists* – Alpha2-adrenergic agonists, commonly used to treat opioid withdrawal syndrome, work by decreasing the central nervous system noradrenergic activity that has become hyperactive following prolonged use of opioids (Gossop, 1998). Clonidine was the first such agonist to be used to treat withdrawal, but due to its side effects of sedation and hypotension, other agonists, most commonly lofedidine and guanfacine, have also been investigated and used clinically (Gowing et al., 2016). A systematic review (Gowing, Farrell et al.,

[17] Note that nine of the 27 studies included in this review reported using sublingual buprenorphine/naloxone tablets.

2016) comparing the efficacy of alpha2-adrenergic agonists (clonidine, lofexidine, guanfacine, tizanidine) with reducing doses of methadone and found that the overall intensity of withdrawal associated with alpha2-adrenergic agonist treatment appears similar to, or perhaps marginally greater than, that associated with methadone. The signs and symptoms of withdrawal occurred and resolved earlier with alpha2-adrenergic agonists, resulting in shorter treatment duration compared to methadone but both forms of treatment were found to have similar rates of treatment completion. Hypotensive or other adverse effects were significantly more likely with alpha2-adrenergic agonists, compared to methadone. Available data suggest that lofexidine does not reduce blood pressure to the same extent as clonidine, but is otherwise similar to clonidine.

Opioid agonist treatment (OAT)

As emphasized in the previous section, because of the high risk of relapse, and subsequent risk of overdose and mortality, withdrawal management alone is not recommended to treat opioid withdrawal syndrome. Withdrawal management should only be offered when it can be integrated into ongoing substance use/addiction treatment (for example, long-term OAT, intensive outpatient treatment, residential treatment).[18]

CRISM's national guidelines (Canadian Research Initiative on Substance Misuse, 2018) recommend OAT as the first-line treatment option for OUD. This recommendation reflects the substantial research evidence showing that OAT, using either methadone or buprenorphine/naloxone (described in the previous section), is significantly more effective than non-pharmacological treatments in retaining individuals in treatment, suppressing illicit opioid use, reducing morbidity and mortality, and reducing

[18] As per CRISM national guidelines,"'addiction treatment" refers to continued care for opioid use disorder delivered by an experienced care provider, which could include pharmacological treatment [opioid agonist treatment (OAT) or antagonist treatment], evidence-based psychosocial treatment, residential treatment, or combinations of these treatment options. In isolation, withdrawal management, harm reduction services, low-barrier housing and unstructured peer-based support would not be considered "addiction treatment". OAT may be provided in an outpatient or in an inpatient addiction-treatment setting."(p.22)

the risk of HIV and hepatitis infections among people who inject drugs (Canadian Research Initiative on Substance Misuse, 2018). OAT is also recommended for pregnant women. OAT with methadone has been shown to be superior to both untreated OUD and medically supervised withdrawal management with respect to positive maternal and neonatal outcomes. There is also preliminary evidence that buprenorphine/naloxone, given its supervisory safety profile, may be an appropriate first-line option for some pregnant women (Canadian Research Initiative on Substance Misuse, 2018).

Up until recently, methadone has been widely used as the first-line option for OAT and there have been many studies demonstrating its positive impacts. Overall, even decades of opioids including methadone appear to be well tolerated physiologically, although some long-term opioid users experience chronic constipation, excessive sweating, peripheral edema, drowsiness, and decreased libido (O'Malley & O'Malley, 2018).

A comprehensive systematic review (Fullerton et al., 2014) found a high level of evidence for methadone with respect to treatment retention and reducing illicit opioid use. Evidence from this same review also suggested positive impacts on drug-related HIV risk behaviours, mortality, and criminality. However, methadone is also associated with a number of risks. Relative to many other opioids, methadone brings an increased risk of toxicity and adverse events, due to its long elimination half-life, narrow therapeutic index, and high potential for interactions with alcohol and other drugs, particularly benzodiazepines. As well, methadone is associated with increased risk of overdose death during early stages of treatment, immediately after discontinuing OAT, and in instances where methadone is diverted and used by individuals for whom it was not prescribed (Canadian Research Initiative on Substance Misuse, 2018).

Because the opioid agonist effects of buprenorphine are partial, it does carry less risk of respiratory depression, side effects, dependence and non-medical use, making it a safer option than methadone, a full opioid agonist. Co-formulation with naloxone, which blocks the euphoric effects of buprenorphine, further enhances its safety profile by reducing the risk of diversion and non-medical use (Canadian Research Initiative on Substance Misuse, 2018). However, because buprenorphine/naloxone may precipitate withdrawal following recent use of opioids, individuals must already be in moderate withdrawal before induction, which may be difficult to tolerate. In these cases, induction in an inpatient

setting may be indicated where more intensive monitoring, support, and symptom management can be offered (Canadian Research Initiative on Substance Misuse, 2018).

A 2016 meta-analysis of research (Nielsen et al., 2016) comparing buprenorphine and methadone did not find significant differences in terms of their impacts on self-reported opioid use or treatment retention. Nor were differences found with respect to adverse events. However, these experimental findings regarding adverse events are in contrast to analyses of population-level data. For example, a study analyzing health administration data related to 19 million prescriptions of methadone or buprenorphine, made over a six-year period in the UK, considered the impacts of these medications for both individuals for whom they were prescribed, as well the wider population who consumed, but were not prescribed them. Buprenorphine was found to be six times safer than methadone with regard to overdose risk for the general population, reinforcing the increased risk of prescribing methadone, secondary to diversion (Marteau et al., 2015). Further, a retrospective analysis of data from the U.S. National Poison Data System compared the severity of buprenorphine and methadone toxicity with concomitant benzodiazepines. Results showed that among the 692 methadone-related cases and 72 buprenorphine-related cases identified, nonmedical use of benzodiazepines with methadone was associated with higher hospitalizations, greater utilization rates of intensive care units (ICUs) and considerably worse medical outcomes (Lee et al., 2014).

There is growing evidence supporting the use of slow-release oral morphine as an OAT medication (Canadian Research Initiative on Substance Misuse, 2018). Morphine is a pure agonist with a different mode of action from that of methadone and buprenorphine, but with a markedly shorter half-life. Slow-release oral preparations of morphine have since been developed as an alternative to methadone, and result in sustained blood concentrations for 24 hours (Beck et al., 2013). A recent systematic review and meta-analysis (Klimas et al., 2019), examining the results of four randomized controlled clinical trials with low-to-moderate methodological quality, found that slow-release oral morphine may be generally equal to methadone in the treatment of OUD. No significant differences were found with respect to treatment retention and heroin use and, while not amenable to meta-analysis, results from two studies indicated that slow-release oral morphine reduces cravings for heroin more than methadone. Slow-release oral morphine was also associated with higher treatment satisfaction and fewer adverse mental symptoms. Several non-randomized studies also found that transitioning from methadone to slow-

release oral morphine was relatively simple and well-tolerated (Canadian Research Initiative on Substance Misuse, 2018), including one trial that found that the majority of individuals (78%), expressed a preference for slow-release oral morphine over methadone (22%; Mitchell et al., 2004).

Finally, naltrexone, an opioid receptor antagonist that blocks the euphoric effects of opioids, has been found to have limited benefits in the treatment of OUD. A Cochrane review (Minozzi et al., 2011) found that naltrexone was no better than placebo in terms of treatment retention and abstinence, and had limited benefits compared to other pharmacological treatments. These limitations notwithstanding, there may be circumstances where oral naltrexone, the only formulation currently available in Canada, may be preferred or requested by individuals with OUD, such as those who wish to avoid OAT or whose work environment prohibits this form of treatment. As with tapering for withdrawal management (see above), individuals choosing this option should be thoroughly advised of the high rates of relapse and risk of overdose due to loss of opioid tolerance, and should be followed up regularly and closely monitored for risk or signs of relapse to opioid use (Canadian Research Initiative on Substance Misuse, 2018).

Based on the overall body of evidence regarding these pharmacological options, CRISM's national guidelines (Canadian Research Initiative on Substance Misuse, 2018) recommend OAT be initiated first with buprenorphine/naloxone, whenever feasible, to reduce the risk of toxicity, morbidity and mortality, as well as to facilitate safer take-home dosing. Methadone treatment should be considered as a second-line treatment, in instances when individuals respond poorly to buprenorphine/naloxone or when treatment with methadone is the individual's preferred option. Slow-release oral morphine is recommended as an adjust treatment option in instances when first- and second-line treatment options are ineffective or contraindicated (see also Table 6 below). CRISM also provides a strong recommendation, supported by moderate evidence, that psychosocial treatment interventions and supports should be routinely offered, but should not be viewed as a mandatory requirement for accessing OAT. This recommendation reflects the findings from two Cochrane reviews that found that psychosocial treatment conferred no additional benefits, compared to standard OAT programs, in terms of retaining clients in treatment, supporting abstinence, or preventing relapse (Amato, Minozzi, Davoli & Vecchi, 2011a), but that it did confer benefits in terms of improved retention and reduced opiate use

during and after treatment in the context of pharmacological detoxification treatment (Amato, Minozzi, Davoli & Vecchi, 2011b).

Table 6. Opioid agonist treatment options for OUD[19]

	Quality of evidence	Strength of recommendation
Recommended first- and second-line treatment options		
Initiate opioid agonist treatment (OAT) with buprenorphine/ naloxone whenever feasible to reduce the risk of toxicity, morbidity and mortality, as well as to facilitate safer take-home dosing.	High	Strong
For individuals responding poorly to buprenorphine/naloxone, consider transition to methadone treatment.	High	Strong
Initiate OAT with methadone when treatment with buprenorphine/naloxone is not the preferred option.	High	Strong
For individuals with a successful and sustained response to methadone who express a desire for treatment simplification, consider transition to buprenorphine/ naloxone, since its superior safety profile allows for more routine take-home dosing and less frequent medical appointments.	Moderate	Strong
Recommended adjunct treatment option		
In patients for whom first- and second-line treatment options are ineffective or contraindicated, OAT with slow-release oral morphine (ideally prescribed as once daily witnessed doses) can be considered. Slow-release oral morphine treatment should only be prescribed by physicians with a Section 56 exemption to prescribe methadone, or following consultation with an addiction practitioner experienced in OAT with slow-release oral morphine.	Moderate	Strong

[19] Adapted from Canadian Research Initiative on Substance Misuse, 2018, p. 20

Some individuals do not respond adequately to opioid agonist treatment (OAT) and are referred to as having "refractory"[20] OUD. For these individuals, prescribed heroin that is self-injected under supervision (otherwise known as injectable OAT, or iOAT), has been found to be effective in reducing illicit drug use, attracting and retaining individuals in treatment, and enhancing a range of physical and mental health indicators (Strang et al., 2015). Most studies compared iOAT (using diacetylmorphine) to first-line oral OAT (using methadone). When the results of these trials were pooled, iOAT was found to be superior to oral OAT in reducing the use of illicit 'street' heroin, treatment drop out, mortality, and criminal activity and incarceration (Ferri et al., 2010, Strang, 2015) and in improving social functioning (Ferri et al., 2010). Furthermore, a Canadian trial showed that iOAT using hydromorphone was as effective as iOAT using diacetylmorphine in terms of reduction of illicit drug use and retention in treatment (Oviedo-Joekes et al., 2016).

Clinical trials also found that clients receiving iOAT experience significantly more adverse clinical events (e.g., seizures, over sedation) compared to oral OAT (and more adverse events for treatment using DAM, compared to HDM; Oviedo-Joekes et al., 2016). These events were generally safely managed by clinical staff and were significantly less harmful than the risks associated with injecting street drugs (Canadian Research Initiative in Substance Misuse, 2019a). While this increased risk for adverse events points to the need for adequate clinical supervision for iOAT, researchers concluded that "*safety is not an evidence-based barrier to the implementation of treatment with injectable hydromorphone and diacetylmorphine*" (Oviedo-Joekes et al., 2019, p.7).

As of 2018, there were ten service facilities—seven in BC and three in Ontario[21]—offering iOAT programs (Canadian Research Initiative on Substance Misuse, 2019b). Broader implementation of this treatment option has been constrained by significant regulatory barriers that limit access to

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[20] As noted in the CRISM clinical guidelines (Canadian Research Initiative on Substance Misuse, 2019a), there has been an intentional shift away from this term as it may perpetuate stigma towards individuals with substance use disorders since it does not reflect the reality that substance use disorders are often chronic, relapsing conditions that may require multiple treatments and treatment approaches over time. It is used in this document to reflect the scientific literature regarding iOAT.

[21] At least three more programs have since been implemented in Alberta and British Columbia.

diacetylmorphine and hydromorphone. This context changed significantly in the spring of 2019, when, in response to the growing opioid crisis, Health Canada added diacetylmorphine to its list of drugs approved to address the urgent public health need, following a request by Canada's Chief Public Health Officer. It also approved hydromorphone for use as a treatment for severe opioid use disorder (Health Canada, 2019).

In 2019, CRISM released national clinical guidelines (Canadian Research Initiative on Substance Misuse, 2019a), which recommended iOAT for individuals with severe, refractory OUD and ongoing opioid use disorder (see Table 7 below for this and related recommendations).

Table 7. CRISM national guidelines[22]

Recommendation	Quality of evidence	Strength of recommendation
Injectable opioid agonist treatment		
1. Injectable opioid agonist treatment should be considered for individuals with severe, treatment refractory opioid use disorder and ongoing illicit injection opioid use.	Moderate	Conditional
Medication selection		
2. For patients determined likely to benefit from injectable opioid agonist treatment, both diacetylmorphine and hydromorphone are acceptable treatment options.	Low	Strong
Treatment end date		
3. Injectable opioid agonist treatment should be provided as an open-ended treatment, with decisions to transition to oral OAT made collaboratively with the patient.	Low	Strong

[22] Adapted from Canadian Research Initiative on Substance Misuse (2019a)

6.3 Stimulants

Stimulants are a class of drugs that includes amphetamines, cocaine, and ecstasy (MDMA)[23]. Stimulants vary in appearance, composition, effect, mode of administration and availability (Manning et al., 2018) but are generally taken for their resulting euphoria, increased energy, libido, alertness and confidence, and reduced fatigue and appetite. These effects are mediated by the facilitation of the activity of the monoamine neurotransmitters (i.e., dopamine, norepinephrine and serotonin) in the central and peripheral nervous systems. Chronic use is frequently carried out in binge-abstinence cycles and the potential for developing dependence is high (Ciccarone, 2011).

This section focuses on two specific stimulants—cocaine, the most commonly used stimulant, and methamphetamines, which, while less commonly used, is associated with significant individual and social harms as well as burden on the health care system (Standing Committee on Health, 2019).

Cocaine

Cocaine is extracted from the coca plant, grown primarily in South America. It is available as white power and is taken through the nose by snorting. Alternatively, it can be dissolved and then injected or, in the case of "freebase" or "crack" cocaine, smoked (Canadian Centre on Substance Use and Addiction, 2019). In 2017, 2.5% of Canadians aged 15 years and older reported using cocaine in the past twelve months (up from 0.9% in 2013), making it the third most common substance used in the country (next to alcohol and cannabis; Canadian Centre on Substance Use and Addiction, 2019).

Cocaine can cause immediate feelings of euphoria and large bursts of energy, the intensity and length of which varies depending on the route of administration. Other effects include increased alertness, increased body temperature, increased heart rate and blood pressure, agitation, paranoia, suppressed appetite, muscle spasms, stroke, fainting and overdose. Long-term use of cocaine can result in sleep disturbance, weight loss, depression, cardiovascular problems, hallucinations, seizures, a wide range of

[23] Ecstasy also has hallucinogenic properties.

cognitive impairments and dependence (Canadian Centre on Substance Abuse and Addiction, 2019). Other adverse effects are associated with specific routes of administration—for example, regular snorting can lead to a loss of sense of smell, nosebleeds, problems with swallowing and overall irritation of the nasal septum; smoking crack can damage lungs and worsen asthma; and injecting cocaine is associated with increased risks for infectious diseases and allergic reactions (National Institute on Drug Abuse, 2016).

Methamphetamines

Methamphetamine is a synthetic central nervous system stimulant that triggers a cascading release of noradrenaline, dopamine and serotonin. Use results in similar physiological and psychological effects as that of an adrenaline-provoked fight-or-flight response (e.g., increased heart rate and blood pressure, constriction of the arterial walls, expansion of air passages and increased blood sugar; Grigg et al., 2018). Methamphetamines are illegal to use in Canada but are available through illicit production in clandestine laboratories using a variety of inexpensive chemicals and other compounds extracted from over the counter medications. Methamphetamines are sold either as a powder, tablets, or as rock-like chunks or crystals, and, depending on the form, can be snorted, injected, ingested or smoked (Canadian Centre on Substance Use and Addiction, 2018).

Individuals who use methamphetamines experience an immediate increase in focus, mental alertness and confidence, elimination of fatigue, and a decrease in appetite (Grigg et al., 2018). When smoked or injected, methamphetamines can also produce a state of euphoria and high energy. The high associated with its use is mediated by increased levels of the neurotransmitter dopamine in the brain, levels that are much higher than those produced by other stimulants, such as cocaine, resulting in stronger and more prolonged effects (Canadian Centre on Substance Abuse and Addiction, 2018).

Long-term use of methamphetamines is associated with an increased risk for developing psychosis or psychotic symptoms, including violent behaviour, paranoia, hallucinations and delusions. It can also result in mood swings, insomnia, memory loss, poor nutrition and respiratory diseases (Canadian Centre on Substance Abuse and Addiction, 2018). Repeated use often leads to rapid development (i.e., over weeks or months) of tolerance and dependent use (Grigg et al., 2018). Because of this long-term

neurotoxicity, acute complications and high potency and potential for dependence, methamphetamines are considered more dangerous than other stimulants (Gouzoulis-Mayfrank et al., 2017).

Compared to other illicit drugs, rates of self-reported use of methamphetamines in Canada is low in the general population (~0.2%), but has been increasing in specific sub-populations, including those accessing treatment or harm reduction services. Surveillance evidence suggests that the availability of methamphetamines may also have increased in recent years, based on a significant rise in drug offences and seizures, including a 590% increase in possession incidents between 2010 and 2017 (Canadian Centre on Substance Abuse and Addiction, 2018).

6.3.1 Withdrawal

Stimulant withdrawal itself is not life threatening but due to the complex presentation of many users seeking treatment, often requires clinical assessment and withdrawal management (Manning et al., 2018). General symptoms of stimulant withdrawal include depression, sleep disturbances, fatigue, anxiety, irritability, poor concentration, psychomotor retardation, increased appetite, paranoia and drug craving. Because individuals with stimulant use disorder have difficulties achieving abstinence, these withdrawal symptoms may be regularly experienced as part of active addiction (Centre for Substance Abuse Treatment, 2015).

Cocaine

Cocaine acts by interfering with the brain's mesolimbic dopamine system, otherwise known as the brain's "reward pathway". Cocaine binds to the dopamine transporter, which is responsible for removing dopamine from the synapse, or space, between neurons of the brain, resulting in accumulation of dopamine. The effects of this is commonly experienced as euphoria. With repeated exposure to cocaine, the brain starts to adapt so that this reward pathway becomes less sensitive to natural reinforcers (e.g., food, sex, etc.), while circuits involved in stress become simultaneously increasingly sensitive. As a result, in the absence of cocaine, the individual experiences common signs of withdrawal including increased displeasure, negative moods, anxiety and irritability (National Institute on Drug Abuse, 2016).

Due to the relatively short half life of cocaine, withdrawal symptoms can occur quickly after last use. The first phase of withdrawal, commonly referred to as the "crash" period, typically lasts between 9 hours and 4 days and is characterized by acute agitation, depression, increased appetite and need for sleep, and decreased cravings for cocaine. During the second "withdrawal" phase, generally lasting between 1-10 weeks, disturbances of sleep and mood stabilize but anxiety and cravings increase. In the final "extinction" phase, while most symptoms have resolved, both episodic and trigger cravings can persist for an indefinite period of time (Gawin & Kleber, 1986).

About one half to three-fourths of individuals who abuse cocaine will also experience transient psychotic symptoms. A smaller subset of these individuals develop a cocaine-induced psychotic disorder, characterized by psychotic symptoms that persist for a longer duration and are of greater severity than would would be expected in cocaine intoxication or withdrawal. The symptoms of this disorder include auditory and visual hallucinations, paranoia, violence and aggression, and simple or complex repetitive behaviours (e.g., picking at clothes, drawing or writing; Tang, Martin & Cotes, 2014).

Methamphetamines

In general, withdrawal from methamphetamines occurs over a longer period compared to other drugs (Grigg et al., 2018). Similar to cocaine use, chronic methamphetamine use typically follows a "binge-crash" cycle whereby the drug is taken repeatedly for days (the binge), and is followed by a "crash" period during which the individual begins to experience acute withdrawal symptoms (Canadian Centre on Substance Abuse and Addiction, 2018). This period generally lasts 7-10 days and is characterized by intense feelings of depression, irritability, paranoia, amotivation, low energy, sleep issues, and increased appetite. This is followed by a subacute phase, generally lasting at least two weeks, during which most withdrawal symptoms stabilize (Grigg et al., 2018). Some symptoms may persist well beyond this timeframe, however, particularly intense cravings for methamphetamines, which significantly increases the risk for relapse, and residual symptoms of psychosis (Wodarz et al., 2017).

6.3.2 Assessment

A thorough assessment during the withdrawal stage is required to determine the level of intervention. In addition to gaining a profile of the nature of stimulant use (e.g., quantity, frequency, mode of administration, presence of dependence, previous withdrawal episodes), the assessment should

determine the presence of poly-drug use and dependence, particularly alcohol, cannabis and nicotine use, all of which are common in individuals dependent on stimulants, and which may complicate withdrawal recovery. Physical health issues should also be assessed, including medical complications resulting from use (Manning et al., 2018). Finally, because psychiatric disorders are common among stimulant users—particularly depression, anxiety and drug-induced psychosis (Baker, Lee & Jenner, 2004), and because the relationship between mental health and substance use is often complex and bidirectional (Gouzoulis-Mayfrank et al., 2017), mental health symptoms should be thoroughly assessed to determine whether they are secondary to stimulant withdrawal or reflect the presence of a comorbid mental health issue.

Accurate differential diagnosis of substance-induced psychotic disorder versus the presence of new onset or relapsing psychotic illness is critical to minimizing the risk of medical mismanagement (Grigg et al., 2018; Tang, Martin & Cotes, 2016). Differential diagnosis requires a detailed understanding of the timing of substance use relative to the emergence of psychotic symptoms (Tang, Martin & Cotes, 2016). In the case of cocaine use, individuals who develop cocaine-induced psychotic disorder are more likely to be male and younger, have a longer duration and severity of cocaine use, be an intravenous drug user, and have an earlier onset of use (Tang, Martin & Cotes, 2016). Persistent psychotic symptoms among methamphetamine users seeking psychiatric treatment were found to be associated with being significantly older, having more severe psychotic symptoms, longer-term misuse of methamphetamines, more antisocial personality traits, and more sustained depressive symptoms (Lecomte et al., 2013).

Standardized tools are available to support the assessment and monitoring of withdrawal. For cocaine withdrawal, the Cocaine Selective Severity Assessment (CCSA; Kampman et al., 1998), an 18-item, clinician-administered instrument, was found to be a valid and reliable measure of cocaine-related early withdrawal symptoms. It was also found to be useful in predicting negative outcomes in cocaine dependence treatment (Kampman et al., 1998).

Studies conducted in Australia found that scales designed specifically to measure and monitor methamphetamine withdrawal are not commonly used in treatment settings (Pennay & Lee, 2011). Two validated scales are available for the measurement and treatment of withdrawal from the broader drug class of amphetamines. The Amphetamine Withdrawal Questionnaire (AWQ; Srisurapanont, Jarusuraisin & Jittiwutikan, 1999) is a 10-item scale that evaluates amphetamine withdrawal symptoms. Its

psychometric properties were tested in both inpatient and outpatient settings and were found to be both reliable and valid. Preliminary evidence for the presence of three subscales—hyperarousal, reversed vegetative and anxiety—were also found (Srisurapanont et al., 1999).

The Amphetamine Cessation Symptom Assessment (ACSA; McGregor et al., 2008), a 16-item scale that also measures amphetamine withdrawal symptoms, was developed based on two existing scales with known validity and reliability, one of which was the AWG (described above). The time frame for the scale is the previous 24 hours, making it suitable for once-daily administration. It was found to be valid and reliable when used for treatment-seeking amphetamine users in an inpatient setting, and, like the AWG, has three subscales: anxiety and mood; fatigue, and craving (McGregor et al., 2008).

6.3.3 Management

The most effective approach to treating stimulant withdrawal is to establish a period of abstinence. During this period, individuals typically require time to rest due to significant sleep deprivation, and benefit from nutritious meals as food intake is often inadequate during stimulant use (Centre for Substance Abuse Treatment, 2006). Psychological support and other therapies should also be offered to assist the person to safely complete withdrawal and to engage in aftercare (Baker, Lee & Jenner, 2004). Because withdrawal does not typically involve medical complications, management can usually be facilitated in community settings (American Psychological Association, 2011; Manning et al., 2018), except in the case of complex presentations, where more intensive, inpatient supports may be required (Manning et al., 2018). There are no standard guidelines to manage stimulant withdrawal (Manning et al., 2018), nor have any medications been approved for treatment (Centre for Substance Abuse Treatment, 2006). Medications may be used to treat specific symptoms of withdrawal, including sleep disturbances, agitation and psychosis. Management for withdrawal from cocaine and methamphetamines are described separately below.

Cocaine

As above, no pharmacological interventions have been proven to be efficacious in treating withdrawal from cocaine. There are, however, medications that have shown promising results in clinical trials. For example, several studies found modafinil, a stimulant-like drug that is approved to treat narcolepsy, to be effective in reducing cocaine use, euphoric effects, cravings and withdrawal symptoms (Kampman et

al., 2015). And propranolol, a betablocker primarily used to treat angina and hypertension, has been found to reduce anxiety and other withdrawal symptoms for individuals with severe cocaine dependence (Kampman, 2005).

Medications are commonly used in clinical practice to treat specific symptoms of cocaine withdrawal. In the case of psychotic symptoms and associated agitation, the initial focus of pharmacotherapy should be on keeping the patient and staff safe (Tang, Martin & Cotes, 2014). Benzodiazepines are recommended as first-line treatment for agitation (American Psychiatric Association, 2010; Tang Martin, & Cotes, 2014). If agitation does not settle, atypical antipsychotic may be administered, either on their own, or in conjunction with benzodiazepines. Antipsychotic mediations are also recommended in cases where the diagnosis is unclear between cocaine-induced and primary psychotic disorder. Their use should be continued only until their sedative effect is evident, and they can usually be discontinued within the first 72 hours of withdrawal (Tang, Martin & Cotes, 2014).

A Cochrane review of 31 studies (Pani, Trogu, Vecchi & Amato, 2011), investigating the efficacy of antidepressants for the treatment of cocaine dependence found evidence of positive mood-related outcomes, but these impacts were not associated with more direct indicators of cocaine abuse/dependence (including cocaine use and treatment engagement). Another Cochrane review of 12 randomized clinical trials (Alverez et al., 2013) found insufficient evidence to support the use of antipsychotic medications for the treatment of cocaine dependence (including for the treatment of cravings associated with withdrawal).

Methamphetamines

Management of withdrawal from methamphetamines aims to achieve several goals, including alleviation of withdrawal symptoms and prevention of complications; diagnostic evaluation, counselling and, where appropriate, initiation of treatment for comorbid physical and psychiatric disorders; and initiation of supports to address commonly faced social barriers (Wodarz et al., 2017). There is limited evidence regarding which setting(s) is most appropriate to achieve these goals (Grigg et al., 2018). Home-based withdrawal management is suitable and safe for clients assessed as being low risk of complex withdrawal (Grigg et al., 2018), provided there is sufficient and regular clinical contact (Pennay et al., 2011). The home is also a more common setting for management given the protracted period of

withdrawal that generally exceeds typical inpatient lengths of stay and because it is more appealing for many methamphetamine users who are reluctant to access mainstream treatment services (Pennay & Lee, 2011). Inpatient settings are appropriate for individuals with severe psychotic symptoms, significant polydrug dependence, severe depression, or who have other social risk factors, such as homelessness.

Regardless of the setting, the environment should be quiet, calming and with low stimulation to prevent secondary harm due to panic or expansive and aggressive behaviour, which are common in this treatment population. Relatedly, special consideration should also be given to the safety of staff and other helpers (Wodarz et al., 2017). Use of restraints, which is associated with increased risk of life-threatening conditions, should only be used as a last resort and on a temporary basis (Wodarz et al., 2017).

Generally, the major focus of methamphetamine withdrawal management is on psychosocial strategies since no pharmacological interventions have been found to be effective (Grigg et al., 2018; Shoptaw, Kao, Heinzerling, & Ling, 2009). As well, because individuals presenting to treatment frequently have consumed other drugs, in addition to methamphetamines, administration of medication should be avoided whenever possible, unless regular medical monitoring is available. During the acute phase of withdrawal (see section 6.3.1 above), management will generally include rest, reassurance, psychoeducation and symptom management. During the subacute phase, specific psychological therapies, including CBT, contingency management and motivational interviewing can be introduced to increase abstinence rates and reduce anxiety, depression and social dysfunction (Grigg et al., 2018). Exercise therapy, which has been found to improve withdrawal symptoms, including craving, anxiety and depression, is also recommended as a supportive treatment (Gouzoulis-Mayfrank et al., 2017).

Medical management, when indicated, is primarily focused on the use of symptomatic medications. Short-term use of fast-acting benzodiazepines is the recommended first-choice in the case of severe agitation, anxiety, aggressive behavior, and/or sleep disturbances (Grigg et al., 2018; Wordarz et al., 2018). Anti-psychotic drugs are recommended for methamphetamine-induced psychosis and preference should be given to second-generation drugs, since they have a better safety profile compared to first generation anti-psychotics (Grigg et al., 2018; Wordarz et al., 2017). Their use should be reviewed within six months since the dopamine-blocking effects of antipsychotic medication may promote methamphetamine craving and relapses (Grigg et al., 2018). Use of selective serotonin-reuptake

inhibitors (SSRIs), even to treat depressive symptoms, is specifically advised against, because of the danger of serotonin syndrome and the increased rate of side effects (Gouzoulis-Mayfrank et al., 2017).

6.4 Benzodiazepines

Benzodiazepines are a class of drugs commonly prescribed to treat anxiety and sleep disorders. They are also used as muscle relaxants and for the short-term management of alcohol withdrawal syndrome (see also section 6.1.3). Benzodiazepines work by enhancing the effects of the major inhibitory neurotransmitter gamma-aminobutyric acid (GABA) in the central nervous system (Darker et al., 2015). They are widely prescribed for their rapid onset of action, clinical efficacy, low toxicity and decreased risk of suicide (Canadian Agency for Drugs and Technologies in Health, 2015).

Long-term use of benzodiazepines, however, offers little therapeutic benefit and comes with significant risks (Canadian College of Physicians and Surgeons of Alberta, 2016; Darker et al., 2015). Over the short-term, use can result in impairment of daily functioning due to sleepiness, increased risk of motor vehicle accidents, falls and related fractures — particularly amongst older adults -- and the potential for abuse or misuse. Long-term use is also associated with tolerance and physical dependence, cognitive and memory impairment, and dementia (Canadian Agency for Drugs and Technologies, 2015; Darker et al., 2015). It has been estimated that between 3-9% of Canadian adults, and a much higher proportion of older adults, use benzodiazepines (Canadian Agency for Drugs and Technologies in Health, 2015).

6.4.1 Benzodiazepine withdrawal syndrome

Most symptoms of benzodiazepine withdrawal are associated with hyperexcitability of the brain (Soyka, 2017) and can range in severity from relatively mild to complex and high risk. Symptoms are often worse with short half-life drugs, such as alprazolam, compared to longer half-life drugs. Similarly, while the onset of symptoms is variable, it generally occurs faster following withdrawal of shorter acting agents (within 2-3 days) than for longer-acting agents (within 5-10 days; Soyka, 2017). Other factors affecting onset and severity include the type of benzodiazepine, dose, and duration of use, as well as individual characteristics (see also below; Manning et al., 2018). Individuals can experience a range of symptoms including physical (e.g., headaches, sweating, muscle pain and sweating), neurological (e.g., dizziness, visual disturbances, disorientation, paraesthesia, hallucinations and seizures), gastrointestinal (e.g.,

nausea, diarrhea), and psychological (rebound insomnia, anxiety, irritability, perceptual distortions, depression and impaired concentration; Brett & Murnion, 2015).

6.4.2 Assessment

As with all WMS, treatment planning should be informed by a thorough assessment. In the case of benzodiazepines, initial assessment should identify the nature of most recent drug use, as soon as possible, to manage or prevent overdose, and be followed by regular clinical observations, as applicable. It is also important to confirm the individual's history of benzodiazepine use, including frequency, dose and reason for initial and ongoing use. For example, clients who used benzodiazepines to manage psychological problems may require concurrent treatment of these underlying problems once the benzodiazepine is withdrawn (since rebound symptoms is a common occurrence).

Assessment of poly-drug use is also critical, since benzodiazepine use is common among poly-drug users, particularly among those who misuse alcohol, cannabis and nicotine (Manning et al., 2018), and since poly-drug use can impact the treatment trajectory for any given substance. For example, concurrent use of benzodiazepines and opioids can lead to fatalities as a result of the combined effects on respiratory depression (Fang, Kim, Tang & Choi, 2018). And because many poly-drug users take benzodiazepines sporadically and in a binge pattern, a careful assessment is needed to determine their degree of dependence and whether a reducing regiment of benzodiazepines (see below) is necessary (Manning et al., 2018).

Monitoring of withdrawal symptoms can be facilitated using symptom scales in conjunction with clinical observation and judgement. It is recommended that self-report not be relied on exclusively to monitor symptoms as symptoms of co-morbid conditions, especially anxiety, may be confused with symptoms of withdrawal (Manning et al., 2018). The Clinical Institute Withdrawal Assessment Scale - Benzodiazepines (CIWA-B) is a 22-item instrument, designed to assess and monitor benzodiazepine withdrawal, that can be administered by well-trained personnel (e.g., physicians and nurses; Busto, Sykora, & Sellers, 1989). Although the CIWA-B is commonly used in substance use treatment settings (Saunders & Yang, 2002, as cited in Manning et al., 2018), its psychometric properties have not been extensively evaluated (Manning et al., 2018). The Benzodiazepine Withdrawal Symptom Questionnaire (BWSQ, Tyrer, Murphy & Riley, 1990) is a 20-item self-report instrument that also records the main symptoms during

withdrawal from benzodiazepines. The BWSQ was found to be reliable in studies involving pharmacologically dependent individuals (Tyrer et al., 1990) and depressed chronic benzodiazepine users in primary care treatment settings (Couvée & Zitman, 2002). The latter study also confirmed construct and predictive validity.

6.4.3 Management

There has been more research evidence regarding interventions to promote the discontinuation of benzodiazepines than on how to manage withdrawal symptoms (Canadian Centre on Substance Use and Addiction, 2014). The general consensus from this research is to discontinue benzodiazepine use very gradually (i.e., over a period of several weeks), whenever possible, to prevent seizures and avoid severe withdrawal symptoms, including significant rebound psychiatric symptoms (Canadian Agency for Drugs and Technologies in Health, 2015; Soyka, 2017). While some clinical guidelines (e.g., Manning et al., 2018; National Health Service, 2019; SA Health, 2012) recommend first switching to a longer acting benzodiazepine (typically diazepam), Soyka (2017) noted that the fundamental advantages of this approach is unclear and that it has not been found to be associated with better outcomes.

The rate of withdrawal following discontinuation is often determined by a person's ability to tolerate symptoms, and recommendations range from reducing the daily dose by 50% approximately every week to reducing the daily dose by between 10% and 25% every two weeks. Use of a relatively fixed withdrawal schedule, with a precise duration of withdrawal services is recommended and an overall reduction period between 4 to 8 weeks is generally suitable for most individuals (Soyka, 2017).

The most appropriate setting in which to manage withdrawal should be determined based on a thorough clinical assessment (Manning et al., 2018). While withdrawal can sometimes be managed on an outpatient basis (Soyka, 2017), a monitored setting (e.g., hospital or community) is most appropriate for individuals taking a high daily dose of benzodiazepines, those with co-morbid physical or mental health conditions, those with a history of withdrawal seizures or for those with polydrug use (Manning et al., 2018; SA Health, 2012).

Individuals who are poly-drug users, or who are receiving treatment for substance use, may require specialized consultation to determine the most appropriate course of treatment to manage withdrawal from benzodiazepines. For example, individuals receiving opioid agonist treatment should receive a

stable dose of opioids throughout benzodiazepine withdrawal/discontinuation (except in cases of very high opioid doses or frequent intoxications) to prevent symptoms of opioid withdrawal. Concurrent opioid detoxification is not recommended (see also section 6.2; Soyka, 2017).

A range of symptomatic medications are also often used in conjunction with discontinuation tapers (Manning et al., 2018). For example, antidepressant agents and mood stabilizers may be used for depression and sleep disorders (Soyka, 2017), beta blockers for physical symptoms such as tremors, and anti-convulsants for those with a history of seizures (Manning et al., 2018). There is very modest evidence that melatonin improves sleep during withdrawal, but its use is largely experimental. Selective serotonin-reuptake inhibition (SSRI) antidepressants and the benzodiazepine antagonist flumazenil may also be prescribed for individuals with anxiety disorders, but the latter carries substantial medical risks, including seizures and psychosis (Soyka, 2017). Gaba receptor agonists, known as z-drugs, are occasionally prescribed to manage withdrawal symptoms but are generally not recommended due to their potential for dependence and withdrawal (Manning et al., 2018).

Psychosocial support and interventions should also be available at all WMS to complement medical management of withdrawal symptoms, particularly given that benzodiazepine withdrawal often occurs over extended periods of time (Manning et al., 2018). These interventions have three goals: 1) facilitate the withdrawal itself, 2) facilitate further abstinence, and 3) treat any underlying disorders (Lader, Tylee, & Donaghue, 2009; as cited in Soyka, 2017). No clinical guidelines are available for psychosocial interventions with respect to the first goal. With respect to the second, a recent Cochrane review (Darker et al., 2015), found the most evidence for cognitive behavioural therapy (CBT), used in conjunction with a benzodiazepine taper protocol to reduce benzodiazepine use over the short term (i.e., six months).

6.5 Cannabis

Cannabis is a drug derived from the the dried flowers, fruiting tops and leaves of the cannabis plant, *Cannabis sativa*. The main psychoactive compound in all cannabis products is Δ^9-tetrahydrocannabinol (THC; Nielsen, Gowing, Sabioni, & Le Foll, 2018). Over the short-term, cannabis use results in euphoria and relaxation as well as changes in perception, time distortion and deficits in attention, memory and motor functioning. Other short-term physiological effects include increased heart rate and appetite,

increased blood pressure, dilated pupils, red eyes, dry mouth and throat, and bronchodilation. Chronic use of cannabis is associated with deficits in memory, attention, psychomotor speed and executive functioning, especially if use started in early adolescence. Chronic, long-term use also increases the risk of respiratory issues and mental health conditions, including psychosis, depression and anxiety (Canadian Centre on Substance Use and Addiction, 2018).

In October 2018, the Canadian federal government legalized adult non-medical cannabis use by. Next to alcohol, cannabis is the most commonly used substance in Canada (Canadian Centre on Substance Use and Addiction, 2018). According to the 2017 Canadian Tobacco, Alcohol and Drugs Survey, nearly 15% of Canadians over the age of 15 reported using cannabis in the past year. The prevalence of past year use amongst youth between the ages of 15 and 24 years was almost double (27%) that of the general population (Rotermann, 2019).

6.5.1 Cannabis Withdrawal Syndrome (CWS)

Up until relatively recently, there was considerable debate and controversy regarding the existence of a valid and clinically meaningful cannabis withdrawal syndrome (Schlienz & Vandrey, 2019). That debate has since been set to rest, however, by extensive research, including neurobiological, clinical, neuroimaging and epidemiological studies, that have supported adding cannabis withdrawal as a syndrome (cannabis withdrawal syndrome, or CWS) to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) and as a criterion for cannabis use disorder (Livne, Shmulewitz, Lev-Ran, & Hasin, 2019).

Cannabis withdrawal is mediated by the downregulation of CB1 receptors resulting from chronic cannabis use (Schlienz & Vandrey, 2019). CWS is diagnosed if, within a week after stopping heavy, prolonged cannabis use, more than three of the following seven DSM-5 symptoms occur (Livne et al., 2019):

1. Irritability, anger or aggression
2. Nervousness or anxiety
3. Sleep difficulty (e.g. insomnia, disturbing dreams)
4. Decreased appetite or weight loss
5. Restlessness
6. Depressed mood

7. At least one physical symptom causing significant discomfort (abdominal pain, shakiness/tremors, sweating, fever, chills, headache)

Most symptoms of CWS, which are physiologically similar to that of nicotine withdrawal, are typically experienced within 24-48 hours of last use, peak within 4-6 days, and resolve between 1-3 weeks (Turner, Nader & Graves, 2017). Some symptoms, however, particularly abstinence-induced insomnia and vivid or strange dreams, may take significantly longer to resolve (Schlienz & Vandrey, 2019). The severity and duration of CWS can also vary widely depending on the amount of prior cannabis use, context of cessation (e.g., outpatient vs inpatient, voluntary vs involuntary), personality traits, psychiatric and somatic comorbidity, current life stressors, previous experiences, expectations, support, and severity of dependence. For example, cannabis users with opioid dependence may be less likely to experience CWS, while heavy tobacco users may experience more severe symptoms. Regular use of alcohol may also influence the clinical expression of CWS (Bonnet & Preuss, 2017). There is also evidence that women, relative to men, may experience more severe symptoms (Bonnet & Preuss, 2017; Turner et al., 2017), as well as adult users relative to adolescent users (Bonnet & Preuss, 2017).

Cannabis withdrawal symptoms have been documented in both treatment-seeking and non-treatment-seeking populations and across inpatient and outpatient settings (Schlienz & Vandrey, 2019). CWS occurs in approximately 90% of individuals diagnosed with cannabis dependence (Livne et al., 2019). A recent study (Livne et al., 2019), using data from the National Epidemiologic Survey on Alcohol and Related Conditions–III (NESARC-III), found that 12% of frequent cannabis users in the general US population experienced CWS in the previous year. This same study also found that CWS was associated with significant disability, as well as with mood and anxiety disorders, and a family history of depression. CWS has also been shown to contribute to ongoing cannabis use and disrupted daily living (Livne et al., 2019).

6.5.2 Assessment

Treatment of CWS should be based on a stepped care model, and should begin with a thorough assessment of the nature of cannabis use (i.e., quantity, form, and frequency of use; route of administration; level of dependence), the presence of co-morbid substance use, mental health, and physical health conditions, and the characteristics and severity of any previously experienced withdrawal symptoms (Manning et al., 2018).

Only one validated scale is currently available to assess the severity of current withdrawal symptoms. The Cannabis Withdrawal Scale (Allsop et al., 2011) is a 19-item self- or interviewer- administered scale adapted from the Marijuana Withdrawal Checklist (Budney, Novy, & Hughes, 1999). The scale measures the intensity and associated disability/functional impairment of cannabis withdrawal symptoms experienced over a 24-hour period. It was found to be valid and reliable in a study involving 49 dependent cannabis users and is appropriate for use in both clinical and research settings where regular monitoring of symptoms is required (Allsop et al., 2011).

6.5.3 Management

Symptoms of cannabis withdrawal, while not life threatening (Manning et al., 2018), result in significant distress and functional impairment. As above, cannabis withdrawal is a common reason to avoid quitting cannabis, or to resume use after attempts to quit or cut back (Schlienz & Vandrey, 2019). While one of the goals of treatment of CWS is to mitigate these negative reinforcing effects (Turner, Nader & Graves, 2017), there is insufficient evidence to date that reducing the symptoms of cannabis withdrawal results in sustained cannabis abstinence or prevention of relapse following an attempt to quit/cut back (Bonnett & Preuss, 2017; Schlienz & Vandrey, 2019).

Treatment of CWS is typically performed in community non-residential settings (Bonnet & Preuss, 2017; Manning et al., 2018). Residential services may be required, however, in cases of moderate or severe dependence syndrome, polydrug dependence, low psychosocial functioning, and/or moderate or severe psychiatric comorbidity (Manning et al., 2018). Treatment duration depends on the severity of the cannabis use disorder and/or co-morbid conditions. Ideally, residential services should last for up to three weeks to allow sufficient time to resolve any pure symptoms of CWS so as to more accurately diagnose potential underlying comorbidities (Bonnet & Preuss, 2017). As above, treatment planning should be informed by a thorough assessment, should be guided by principles of stepped care, and should also address any co-occurring mental health issues (Manning et al., 2018).

There are currently no accepted pharmacotherapies for the treatment of cannabis withdrawal or cessation (Bonnet & Preuss, 2017; Nielsen et al., 2018). A recent Cochrane review (Nielsen et al., 2018) of 21 randomized controlled trials found incomplete evidence for all of the medications investigated.

Though limited, some evidence supported the use of THC preparations to reduce the intensity of withdrawal symptoms and cravings. Gabapentin was also found to have some capacity to ameliorate withdrawal symptoms and promote reduction in cannabis use compared to placebo. Some medications were found to reduce specific withdrawal symptoms, but not overall withdrawal scores (e.g., mirtazapine for sleep duration and quality, and lithium for loss of appetite, stomach aches and disturbing dreams).

Clinical guidelines from Australia (Manning, et al., 2018) also support the use of medications to address specific symptoms of CWS, including benzodiazepines for anxiety, irritability and sleep disturbances; paracetamol, non-steroidal anti-inflammatory drugs and hyoscine for physical pain and/or headaches, and promethazine or metoclopramide for nausea. These same guidelines also highlight the importance of psychosocial interventions to complement the medical management of CWS.

6.6 Gambling

Gambling disorder is a "persistent maladaptive pattern of gambling resulting in clinically significant impairment or distress (American Psychiatric Association, 2013, as cited in Rash et al., 2016, p. 3). Gambling disorder can be either episodic or persistent and symptoms can range from mild to severe. The 2002 Canadian Community Health Survey: Cycle 1.2—Mental Health and Well-Being provides the only national data of the prevalence of problem gambling in Canada. The 12-month prevalence for the entire country was 2.0%. New Brunswick and Quebec had the lowest provincial prevalence rates at 1.5% and 1.7% respectively. The highest rate, 2.9% was measured in both Manitoba and Saskatchewan (Cox, Yu, Afifi, & Ladouceur, 2005).

6.6.1 Gambling withdrawal

Withdrawal symptoms resulting from gambling are typically characterized by restlessness or irritability when trying to control gambling, corresponding to DSM-V diagnostic criteria (Sleczka et al., 2015). However, one study (Cunningham-Williams et al., 2009), that examined symptoms experienced by a community sample of adult gamblers, found evidence that these criteria may need to be broadened to include symptoms of guilt, anger and disappointment, which were also found to be associated with cutting back or stopping gambling behaviours.

Research literature pertaining specifically to the treatment of gambling withdrawal symptoms is limited (Lee, Tse, Blaszczynski, Tsang, 2020). A recent review of studies related to internet gaming disorders specifically noted that the state of current knowledge of withdrawal symptomatology is underdeveloped, indicating a need for more qualitative studies that provide clinical descriptions of withdrawal symptoms, as well as empirical data regarding the natural course of withdrawal and/or withdrawal symptom trajectory following intervention (Kaptsis et al., 2016).

.6.2 Co-occurrence with substance use disorders

Gambling disorder was recategorized, in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), from an impulse control disorder to an addiction-related disorder, becoming the first recognized non-substance behavioural addiction (Rash et al., 2016). This recategorization reflects several important links with substance use disorders, including similar diagnostic criteria, shared genetic underpinnings, similar neurobiological effects, common treatment approaches, and high comorbidity rates (Rash et al., 2016). With respect to the latter, a systematic review and meta-analysis of population surveys (Lorains et al., 2011) found that 28% of problem and pathological gamblers had a comorbid alcohol use disorder, and 17% had a comorbid illicit drug use disorder. Rates of comorbidity are also high in populations seeking treatment for gambling issues. Dowling et al., (2015) conducted a systematic review and meta-analysis of 36 studies involving treatment-seeking problem gamblers and found that 21% met the criteria for a current alcohol use disorder, 40% for a lifetime alcohol use disorder, 7% for a current drug use disorder, and 21% for lifetime drug use disorder.

As would be expected, high rates of comorbid gambling issues have also been measured in populations with substance use disorders. For example, in the United States, a general population study (Barnes et al., 2015) found that amongst individuals who met the criteria for alcohol abuse or dependence, 17% were also problem gamblers; this rate went up to 33% amongst those meeting the criteria for marijuana abuse or dependence. An analysis of population data from France found that among those with alcohol use disorders seeking treatment, 6% met the criteria for pathological gambling and a further 12% met the criterial for subsyndromal gambling (ANPAA et al., 2011). Finally, Rush et al. (2008), in their analysis of population-level data from the Canadian Community Health Survey (CCHS), found that the prevalence of all levels of problem gambling increased with substance use severity.

There is also evidence that co-morbid gambling disorder and substance use disorder may impact the recovery process of either disorder. For example, Hodgins and el-Guebaly (2010) followed a naturalistic sample of pathological gamblers who had recently quit gambling and found that those participants with a drug diagnosis during their lifetime were less likely to have a minimum period of abstinence, and individuals who achieved 6 months of abstinence who had a history of alcohol use problems were more likely to relapse. Similarly, Ledgerwood and Downey (2002) found that those individuals enrolled in a methadone maintenance treatment program who were also probable pathological gamblers were more like to use cocaine through therapy and to drop out of treatment. On the positive side, one study of treatment-seeking pathological gamblers found that at-risk alcohol use decreased during gambling treatment (Rash et al., 2011).

These findings lend support to the value of opportunistic screening and integrated treatment approaches in both gambling and substance use treatment settings (Barnes et al., 2015; Rash et al., 2016; Rush et al., 2008). A consensus-based recommendation for opportunistic screening of substance use problems amongst individuals seeking treatment/assessment for gambling (and for screening of gambling problems amongst individuals seeking treatment for substance use issues) is also reflected in guidelines released by the Problem Gambling Research and Treatment Centre (2011) in Australia.

7.0 WMS and primary health care services

Consistent with the tiered framework for planning substance use/addiction service delivery systems, there is a strong role for generic health, social and justice-related services in order to achieve a population-level impact. This includes a critical role for primary health care, especially through collaborative arrangements with specialized mental health and substance use/addiction services (Addiction and Mental Health Collaborative Project Steering Committee, 2015). There are many examples of such collaborative arrangements being implemented across the country, including the Youth Wellness Hubs in Ontario and elsewhere[24]; the Medical Home model in British Columbia[25], and My Health Teams in Manitoba[26].

Primary care providers should also play a central role in an individual's withdrawal management care and ongoing recovery journey (B.C. Ministry of Health, 2017). As an early point of contact in the health care system, they are uniquely positioned to identify substance use issues early on and to assess the need for specialized supports, including WMS. Depending on the severity of symptoms, primary care providers may also be directly involved in managing withdrawal in the community and will be an important long-term resource for coordination of services and follow up (Kates et al., 2011).

> *"…primary health care physicians… should focus on the treatment of alcohol use disorder, and as they are accountable for the health of their patients, failing to treat or address alcohol use disorder is part of failing their responsibility. Not treating alcohol use disorder is in no way different than not treating hypertension, and will lead to serious negative health outcomes including but not limited to premature mortality."*
>
> Rehm et al., 2016 (p. 425)

Rehm and colleagues (2016), in their analysis of the current paradigm and

[24] https://youthhubs.ca/en/
[25] http://www.gpscbc.ca/what-we-do/system-change/patient-medical-homes
[26] https://www.gov.mb.ca/health/primarycare/myhts/elements.html

clinical practice for addressing alcohol use disorders in primary health care settings, emphasized the logic in starting treatment of less severe disorders at the primary care level, before the illness progresses and requires specialized care. They concluded that "*it is not only possible, but desirable*" (p. 425) for primary care physicians to provide this treatment, citing studies showing how alcohol use disorder can be handled in a way similar to the treatment of blood pressure and hypertension (i.e., regular checks for drinking levels, advice on lifestyle if drinking levels are above a threshold, and prescription of medication). They also summarize the substantive body of evidence showing the effectiveness of screening for alcohol use disorders using brief standardized instruments, the provision of brief interventions and referral to treatment. This expectation that substance use disorders should be treated in the primary care setting is also reflected in Health Quality Ontario's draft quality standards for unhealthy alcohol use or alcohol use disorders (Health Quality Ontario, 2019) and for opioid use disorder (Health Quality Ontario, 2018).

"They [family physicians] avoid it. Most of [our] physicians are fee for service. They are not compensated for seeing complex mental health and addiction patients. They disrupt their office. They don't want to see them. They don't feel comfortable with them… There hasn't been much continuing medical education around addiction or mental health. There are a few people doing opioid replacement but that's about it.

Stakeholder perspective

Unfortunately, there continues to be a gap between this capacity to address substance use issues in primary care settings and actual practice. Research shows that primary care providers miss a substantial portion of patients with high risk drinking or alcohol use disorders, particularly if their patients are young and do not have somatic co-morbidities. Further, the treatment rate is the lowest of all mental disorders (Rehm et al., 2016). A recent review of collaborative primary care conducted for the government of New Brunswick (Rush & Furlong, 2018) also noted that integrated substance use services are underrepresented in the examples of collaborative primary care that were shared by key stakeholders, as well as in those described in the research literature.

While primary care is often the first point of contact for individuals with mental health problems (Vogel et al., 2017), individuals with substance use issues are less likely to seek help from this service delivery

setting. A recent study using data from the 2012 Canadian Community Health Survey on Mental Health (Urbanoski, Inglis, & Veldhuizen, 2017) found that individuals with substance use disorders were more likely to rely on informal supports and that only 4% of these individuals and 12% of individuals with a concurrent substance use and mental disorder accessed support from a primary care provider, compared to almost 20% of individuals with mental health problems only. Individuals with substance use issues only were also more likely to report unmet needs.

With respect to the direct delivery of WMS, there is consensus amongst experts that office-based withdrawal management is clearly within the scope of practice of primary care providers for individuals with less severe withdrawal profiles (B.C. Ministry of Health, 2017; Matua Raki, 2011a; Spithoff & Kahan, 2015). Their engagement is also consistent with the trend noted earlier with respect to community residential (section 5.3) and non-residential WMS services (section 5.2) becoming more integrated with other substance use and community services. In the RAAM model, for example, primary care is expected to play a key role in the transition from alcohol withdrawal or stabilization on OAT, that is provided by specialists in addiction medicine, to ongoing support in the community.

It is noteworthy, however, that despite these and other benefits, including safety, high completion rates and uptake to continuing care, research identifies ongoing skepticism among general practitioners for engaging in community-based WMS. Concerns included time requirements and related reimbursement schedules, the ability of patients to self-medicate with the required medication and inadequate housing and overall lack of supports in the home environment (Nadkarni et al., 2017). In addition, these researchers noted that primary care providers are often reluctant to manage withdrawal because of lack of experience and/or knowledge, pointing to the need for standardised protocols, assessment schedules and prescription regimes for different levels of dependence. As an example, one stakeholder from a WMS service in Nova Scotia described providing pre-printed orders to general practitioners, as a collaborative practice to enhance withdrawal management practices in the primary care setting.

Providers with less experience with withdrawal management, or who require additional support for more complex patients, should consult with an addiction medicine physician (B.C. Ministry of Health, 2017; Health Quality Ontario, 2019; Spithoff & Kahan, 2015). Examples of supports that provide access

to advice for physicians include the Rapid Access to Consultative Expertise (RACE)[27] which began in British Columbia (and the Ontario program known as Extension for Community Healthcare Outcomes (ECHO)[28], which began as support for chronic pain management. It is also critical that primary care providers are familiar with the range of substance use services and supports to which patients can be connected following WMS as a next step in their recovery journey (B.C. Ministry of Health, 2017). Examples of resources and training available to primary care providers is provided in Table 8 below.

Finally, and as noted earlier in section 4.2.1, in instances where WMS is offered outside the context of a primary care setting, timely transitions back to primary care and other services and supports is critical to sustaining engagement in substance use treatment and supports for individuals who have completed WMS. This is best facilitated through a collaborative team approach whereby the WMS staff engage the primary care provider in the assessment, wellness planning and transition planning processes. In instances where a client does not have a primary care provider, WMS staff should facilitate such a connection within the individual's community, wherever possible. (B.C. Ministry of Health, 2017).

Timely transitions are particularly important for individuals with opioid use disorder who experience a loss of tolerance to opioids while participating in WMS, placing them at elevated risk of relapse and overdose (Canadian Research Initiative on Substance Misuse, 2018; see also section 6.2.3). Unfortunately, without dedicated supports, these transitions are often unsuccessful. For example, one US study (Stein, Risi, Bailey & Bradley, 2016) found that just over half of individuals with opioid use disorder who received an initial induction of an extended release opioid antagonist treatment during inpatient WMS successfully received their second injection in a primary care setting at their scheduled follow-up one month later. A more recent study (Stein et al., 2019) explored the benefits of an opioid withdrawal management protocol that incorporated a linkage component, following discharge, to a long-term OAT service offered in a primary care setting. Compared to clients receiving standard WMS,

[27] http://www.raceconnect.ca/
[28] https://www.echoontario.ca/

clients who received the additional linkage supports had lower illicit opioid use rates, and higher OAT engagement at all points during the follow up period.

Table 8. Withdrawal management resources for primary health care providers

Resource	Brief description
TIP 24: A Guide to Substance Abuse Services for Primary Care Clinicians: Treatment Improvement Protocol (TIP) Series 24 (Centre for Substance Abuse Treatment, 1997).	The objective of this Treatment Improvement Protocol (TIP) is to help primary care clinicians screen their patients for substance use disorders, conduct brief interventions in the early stages of problem development, and appropriately refer more severely affected patients for in-depth assessment and treatment. The TIP also gives an overview of the types of treatment available and outlines a primary care clinician's role in aftercare.
Safe prescribing practices for addictive medications and management of substance use disorders in primary care: A pocket reference for family physicians (Kahan, 2017a)	This handbook is intended as a quick-reference tool for family physicians to assist them in implementing best practices for prescribing potentially addictive medications and managing substance use disorders in primary care.
Safe opioid prescribing and managing opioid use disorder: A pocket reference for primary care providers (Kahan, 2017b)	This pocket guide is excerpted from *Safe prescribing practices for addictive medications and management of substance use disorders in primary care: A pocket reference for primary care providers* (see above), a quick-reference tool for primary care providers to assist them in implementing best practices for prescribing potentially addictive medications and managing substance use disorders in primary care. This excerpt is a guide to safe opioid prescribing and managing associated complications, including opioid use disorder
Managing opioid use disorder in primary care: PEER simplified guideline (Korownyk, 2019).	These guidelines help simplify the complex management of patients with OUD in primary care and aids clinicians and patients in making informed decisions regarding their care.
Medical issues in the office management of alcohol use disorders: Addiction care is primary care. (Mentoring, Education, and Clinical Tools for Addictions: Primary Care–Hospital Integration (no date).	A pocket card endorsed by the College of Family Physicians of Canada

Substance withdrawal management: Guidelines for medical and nursing practitioners in primary health, specialist addiction, custodial and general hospital settings. Matua Raki. (2011a)	This guideline is one of a series that have been developed to provide information about safer withdrawal management. Each set of guidelines is tailored to the information needs of a particular audience. They have been designed to provide readily accessible and appropriate information for the specialist addiction sector, the general addiction and allied workforces or for people who use substances and their family, whànau and support people.
Primary Care Addiction Toolkit. (Centre for Addiction and Mental Health, n.d.)	This practical reference is for health care providers who work in a primary care setting and who have patients with substance use problems. Based on current clinical evidence and the extensive clinical experience of the contributors and editors, the toolkit addresses common clinical issues, as well as providing useful clinical tools and resources for patients. The Primary Care Addiction Toolkit includes five modules: 1. Fundamentals of addiction 2. Dealing with alcohol problems 3. Smoking cessation 4. Opioid misuse and addiction 5. Problem gambling
Recovery-oriented mental health and addiction care in the patient's Medical Home (College of Family Physicians of Canada, 2018)	This document provides guidance for offering mental health and addiction (MH&A) services using a recovery-oriented approach in the context of the PMH. While applying to family physicians in many practice types, the recommendations are especially relevant for practices aligned with the PMH vision. The guide may also be relevant to other health care providers working collaboratively with family physicians in team-based practices. Practising in alignment with the PMH model—by focusing on continuous, comprehensive, and collaborative care, centred on the needs of the patient—can be a particularly effective way of providing care to people living with MH&A issues.

8.0 Workforce

Workforce planning for WMS will be impacted to some extent by the model of service delivery (see also section 5.0). General principles related to workforce planning, including the availability of the appropriate mix and core competencies, supported by adequate training and supervision, are described below.

8.1 Workforce mix and availability

An interdisciplinary team of appropriately trained clinicians and support staff is recommended for WMS (Centre for Substance Abuse Treatment, 2006). As above, the specific mix will vary depending on the service delivery model, the range and severity of client issues, as well as on the availability of, and degree of integration with, the range of resources available in the service setting and broader community. In general, more specialized and intensive medical expertise will be required for hospital/complexity-enhanced residential WMS (see section 5.4 above), including access to addiction medicine expertise. That said, and as noted in section 5.2 above, all WMS, including non-residential, community-based services, should ideally have access to some level of medical resources, either directly, through integration within the WMS program, or through collaborative arrangements. And as covered in more detail in section 7.0, primary care providers should be considered a part of the interdisciplinary team, even if not directly involved in the delivery of WMS (B.C. Ministry of Health, 2017).

"For dispensing meds, you need nursing staff. For delivering high quality detox services in the community, you don't have to be a nurse. You could be a counsellor, as long as you are trained really well. The diploma doesn't mean you are good at treating people in addiction. You don't have to be regulated for withdrawal management. You just have to be well trained."

Stakeholder perspective

Both British Columbia's guidelines (B.C. Ministry of Health, 2017) and Ontario's standards (Addictions and Mental Health Ontario, 2014) emphasize the need for a broad range of bio-psycho-social-spiritual supports for clients. This is also consistent with the research evidence regarding WMS more generally (see also section 4.2 above). The staffing mix required to deliver these supports will vary in similar ways as for the specific service delivery model, and may include staff with specific expertise in substance use and mental health counselling, system navigation, spiritual/cultural services, case management (to help with things like housing and income supplementation), and harm reduction services. British Columbia's guidelines also emphasize the need for peer support programs such as peer-run self-help groups, peer mentoring, and peer navigation and education. And without defining the exact staff mix for WMS, Ontario's standards (Addictions and Mental Health Ontario, 2014) provide specific recommendations with respect to the amount of staffing required for WMS—namely, a minimum of two direct care providers on duty at all times, and a minimum of one male and one female staff on duty at all times in co-ed facilities to address gender specific needs.

A key challenge, highlighted by several stakeholders, is the limited availability of clinicians with expertise in withdrawal management and addiction medicine. For example, two stakeholders (from Ontario and New Brunswick) discussed that while nurse practitioners represent an important and cost-effective source of medical expertise (and one that has not fully been leveraged), it is difficult to recruit and retain those with sufficient training and comfort to work in WMS settings ("*nurses don't stay, especially if they have addiction medicine training*"; "*most nurse practitioners don't feel they have adequate training to oversee WMS*"). One stakeholder described how, through trial and error, her service has learned to recruit specifically for nurse practitioners (and nurses) with specific experience in team based care. Physician assistants were also identified by a stakeholder as another untapped resource to expand the capacity of medical supports in WMS settings

Physician funding structures were also identified as a barrier to increasing access to physician expertise specifically. For example, a stakeholder in Ontario highlighted how family physicians do not have access to an substance use/addiction code for reimbursement, which serves as a disincentive to treat substance use disorders in a primary care context. To make matters worse, if clients do access specialized addiction medicine services (e.g., a RAAM clinic), they face the possibility of being de-rostered from their family health team. Relatedly, a stakeholder in British Columbia highlighted how the selection of specific versions of community-based WMS is dictated, to some extent, by the funding model available to pay physicians who will be providing services.

> *"We don't have a lot of [medical] resources. We have to be intelligent with navigating what we do have…If developing a province-wide strategy, we need to figure out how to create a multiplication effect of physician expertise."*
>
> Stakeholder perspective

In acknowledgement of the fact that "*no system can have doctors everywhere",* stakeholders described innovative ways to address the challenge of limited medical resources outside of major urban centres ("*there's generally enough of a distribution of expertise in cities, but then we get stuck without any expertise in smaller towns*"). For example, in North Bay, Ontario, in an effort to increase access to specialized expertise, a "roster" of doctors has been created for consultation on a range of specialized medical issues, including withdrawal management. Other more comprehensive examples of supports, noted above in the section on primary care (section 7.0), include the Rapid Access to Consultative Expertise (RACE) which began in British Columbia and the Ontario program known as Extension for Community Healthcare Outcomes (ECHO). In Ontario, one addiction medicine expert consulted for this project highlighted the need to "*amplify knowledge through other health care providers*" and to figure out remote service delivery, particularly through telemedicine. Telemedicine can be effective in both delivering services (see section 4.1 specific to delivery of WMS) and building local capacity through training and other knowledge exchange activities.

A small number of stakeholders highlighted this potential of telemedicine to extend the reach of withdrawal management services in Canada, particularly, to more rural and remote regions where local expertise is often more limited. For example, one addiction medicine specialist described a potential

hub and spoke model for service delivery whereby a physician in a centralized location could manage and supervise, via telemedicine, trained personnel in sites spread across a geographic region. While Canada, in general, has yet to realize the full potential of telemedicine within the broader health care system (Owens, 2018), there are regions in the country where uptake has been much more significant, for example, in northern and rural regions of Ontario via the Ontario Telemedicine Network (O'Gorman, Hogenbirk, & Warry, 2016).

8.2 Competencies and training

The research literature, service guidelines/standards, and feedback from stakeholders all reinforced the importance of staff competencies and training in the delivery of effective and safe WMS services. The most common theme pertained to the need for staff to have general core competencies in substance use/addiction service delivery. Guidelines/standards from British Columbia (B.C. Ministry of Health, 2012), the Northwest Territories (Crowe MacKay, 2014), Ontario (Addictions and Mental Health Ontario, 2014), and Saskatchewan (Government of Saskatchewan Ministry of Health, 2012) all specifically reference the national core competencies released by the Canadian Centre on Substance Use and Addiction (CCSA; 2015) to meet the critical need for standards for the Canadian substance abuse workforce.

CCA's core competencies, listed in Table 9 below, are the measurable knowledge, skills and values needed to perform effectively in a specific function (including withdrawal management) and were identified based on best available evidence including results from cross-Canada consultations, expert reviews, focus group discussions, literature reviews and key informant interviews. This research culminated in the release of a series of competency reports, beginning with two reports outlining behavioural and technical competencies respectively. The series also includes a guide to working with First Nations clients and reflects cultural principles derived from Indigenous knowledge. In addition to the specialized substance abuse treatment workforce, the competencies are also relevant to allied professionals and volunteers who are not in the substance abuse field, but who must respond effectively

to substance abuse issues that they encounter through their work (Canadian Centre on Substance Abuse, 2015). [29]

Table 9. Technical and behavioural competencies for Canada's substance use workforce (Canadian Centre on Susbstance Abuse, 2015)

Technical Competencies	**Behavioural Competencies**
Understanding Substance Use	Adaptability/Flexibility
Understanding Concurrent Disorders	Analytical Thinking and Decision Making
Case Management	Client-centred Change
Client Referral	Client Service Orientation
Community Development	Collaboration and Network Building
Counselling	Continuous Learning
Crisis Intervention	Creativity and Innovation
Family and Social Support	Developing Others
Group Facilitation	Diversity and Cultural Responsiveness
Medications	Effective Communication
Outreach	Ethical Conduct and Professionalism
Prevention and Health Promotion	Interpersonal Rapport/Savvy
Program Development, Implementation and Evaluation	Leadership
	Planning and Organizing
Record Keeping and Documentation	Self Care
Screening and Assessment	Self Management
Trauma-specific Care	Self Motivation and Drive
Treatment Planning	Teamwork and Cooperation

Consistent with the high prevalence of concurrent mental health issues in WMS client populations, and reflecting the evidence presented in section 4.2 above, it is important to specifically highlight the clear need for competencies in identifying and providing supports for mental health issues (a need that is also reflected in CCSA's core competencies described above). This includes, for example, the use of standardized and validated measures to help differentiate between substance induced withdrawal symptoms and mental health disorder (e.g., depression, anxiety, psychosis; see also Section 5.0 for

[29] The entire series of reports is available from the website of the Canadian Centre on Substance Abuse and Addiction (https://www.ccsa.ca/)

details regarding substance-specific considerations in this area). It is also helpful to be familiar and experienced with mental health screening tools that would signal the need for further mental health assessment (see related resource in section 7.0, Table 8).

Staff safety and wellness, reflected in CCSA's core competencies, is another area that requires specific attention in the context of planning for WMS. Ontario's provincial standards for WMS (Addictions and Mental Health Ontario, 2014) include a recommendation for policies and procedures that support the safety of staff, including those related to specific models of care – for example, implementation of telephone screening prior to making a home visit to determine safety to deliver service in a community setting. The need for staff training in crisis intervention is also specifically referenced in Ontario's WMS standards, as well as in the WSM review conducted for the Northwest Territories (Crowe Mackay, 2014). WMS services that manage acute methamphetamine-related presentations, for example, require staff to have skills to recognize and respond to agitation and aggression using the least restrictive means to minimize the risk of harm while upholding the rights and dignity of the client (Griggs et al., 2018; see also section 6.3).

One final area that warrants specific mention is the need for staff training and support to address stigma and discrimination when delivering WMS services. One stakeholder reported that stigma and "*outdated philosophies*" (e.g., moralistic philosophies toward substance use/addiction) persist as significant barriers to providing evidence-based care. This stakeholder's program worked hard to address this barrier by providing training to nursing staff on the neurological basics of substance use/addiction; training which has reportedly resulted in a "*severe drop in stigma -based care*." Stigma is further complicated and exacerbated as it intersects with other social injustices such as racism, sexism, transphobia, homophobia, poverty, etc., (Livingston, 2013), reinforcing the need for staff training to support culturally sensitive and appropriate service delivery (Addictions and Mental Health Ontario, 2014; B.C. Ministry of Health, 2017; Crowe Mackay, 2014; Government of Saskatchewan Ministry of Health, 2012; see also section 4.2.4).

All of the above competencies should be supported by clear policies and resources for staff training and supervision.[30] For example, Ontario's standards (Addictions and Mental Health Ontario, 2014) stipulate the need for written policies and procedures regarding mandatory training and/or certification for staff; for annual performance reviews; and a minimum of 16 hours of continuing education and training opportunities annually for each employee. Provincial/territorial guidelines also emphasize the need for clinical supervision. Access to addiction medicine expertise is also important, for example when serving clients with complex medical issues and for clinicians with limited experience in managing transitions between opioid maintenance treatments (see also section 6.2; Canadian Research Initiative on Substance Misuses, 2018). As above, planning for staff training and support also needs to consider specific requirements related to the model of care for service delivery and specific interventions (e.g., provincial educational and training requirements to prescribe methadone; Canadian Research Initiative on Substance Misuse, 2018). And finally, jurisdictions that are considering expanding traditional inpatient services to include more community and home-based service delivery, including, for example, New Brunswick, will likely require dedicated change management and training resources to support staff who are less familiar/experience with providing care within the context of these models (Mee-Lee, 2014).

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[30] Several agencies are now offering training and certificate courses for clinical and support staff in the areas of substance use/addiction and concurrent disorders, including a free online certificate course offered by the British Columbia Centre onf Substance Use (BCCSU) in partnership with the University of British Columbia (see also https://www.bccsu.ca/about-the-addiction-care-and-treatment-online-certificate/). This course is targeted at care professionals interested in learning more about providing care to patients with various substance use disorders, including alcohol, tobacco, stimulants, cannabis, and opioids. The course can be divided into two sets of modules or educational streams. 1.Addiction Care and Treatment Online Certificate (all core modules plus optional nursing modules); and 2.Substance Use and Addiction Nursing Certificate (with nursing specific content only). Learners can select modules based on their learninggoals, topics, or profession.

9.0 Summary, key messages and implications

This final section provides a summary of the review of models, approaches and practices for WMS, including key messages and implications that may be relevant to system planning in N.B. for WMS specifically, and, as applicable, for the broader substance use/addiction continuum in the province. It is organized according to the areas of inquiry identified for the review (section 1.1) and reflects the three different levels of consideration (i.e., system, service and intervention; see section 2.1).

9.1 *Evidence-based models of WMS*

- The three goals for WMS (1. Withdrawal/detoxitication from one or more psychoactive substances; 2. Provision of care in a safe and humane environment; 3. Supportive and effective transition to other treatment and supports necessary for positive recovery outcomes) are reflected in the diversity of evidence-based models that are supported by research and evaluation studies. There may be tension, however, in the achievement of these goals, specifically with respect to managing acute, often public, intoxication among marginalized populations that have little or no interest in seeking further treatment or support at the present time. Provision of services and supports to this population needs to be considered in treatment system design, and in a way that does not rely unnecessarily on costly acute care health services such as emergency department or inpatient WMS units.

- Regionally and nationally the provision of WMS is extremely resource intensive. WMS resources need to be used wisely in the context of a stepped care treatment system design that includes different levels of WMS with well-communicated and consistently implemented matching criteria. While there is general agreement in the extant literature and ensuing guidelines and standards on these matching criteria for community and hospital-based alternatives, community services can make significant provision for accessing in-house or well-coordinated medical supports as needed. This ensures that only a small minority of individuals in need of WMS will need to be admitted to much more costly hospital inpatient services.

- A regional or provincial WMS system needs to be diversified in terms of the levels of WMS available and resources allocated with careful consideration of population needs. The national NBP model may be useful for determining the optimal combination and capacity for different non-residential and residential options, including hospital based WMS services. Only a small percentage of clients will require intensive medical management since most can be supported in the community, as noted above and in several sections of this report. Health equity will also be an important principle for overall treatment system design, including for WMS, and especially for rural and remote areas. Strategic location of the required hospital-based WMS resources is indicated, as well as making provisions for the application of telemedicine and expert consultation to smaller communities.

- Despite the need for residential WMS options for select individuals experiencing withdrawal from alcohol and/or other drugs, interest remains high in non-residential options given evidence regarding their increased accessibility and effectiveness, comparatively lower cost, and perceived acceptability of these options for many individuals (e.g., those working). There is now considerable experience across Canada in the design and implementation of these non-residential options.

- There are a variety of ways in which community non-residential WMS services can be designed and implemented in order to successfully support a large percentage of the in-need population in a cost-effective and safe manner. In addition to ensuring access to required medical supports, and exploring options for mobile teams and use of telemedicine, the use of flexible "STAR beds" is an evaluated strategy that supports people whose current living situation may be risky for at-home WMS while also facilitating transitions to subsequent treatment.

9.2 Role of withdrawal management within the broader continuum of substance use/addiction services

- Available WMS guidelines consistently confirm that withdrawal management should be planned as part of a structured treatment plan, with emphasis placed on aftercare treatment for short-

term relapse prevention and longer-term support through mutual aid groups and other support services as appropriate. In other words, positive long-term outcomes are dependent on what happens after withdrawal management, and there is now a robust evidence base to suggest that "detox alone" may even be counter-productive as it is likely to lead to relapse. This highlights the importance of designing an overall treatment and support system that places WMS within an integrated continuum of services.

- There is a national trend towards better integration of WMS into other community non-residential and residential options for treatment and support, thereby facilitating both access to WMS as well as transitions to subsequent treatment and support. While the duration of treatment and support services necessary to reach this point is highly individualized, international standards note that individuals who stay at least three months in treatment usually have better outcomes. The development and active implementation of RAAM clinics in some Canadian provinces (e.g., Ontario, Manitoba) is one such model for integrating WMS with low-threshold non-residential services (including addiction medicine) and residential options as required. In planning an integrated community response, it is also essential to include options for identification and diversion of individuals from acute care services, including emergency departments (e.g., liaison nurses placed in emergency departments; RAAM clinics connected to emergency departments).

- The transition from WMS to treatment has been exacerbated by the historical separation of WMS services and other parts of the continuum. Numerous interventions have been developed to facilitate this transition, including outreach visits by treatment staff, case management, incentives and escorts to treatment centres, as well as agency-level interventions like performance contracting. System and service level performance indicators need to measure and report on timely transitions from WMS to subsequent services.

- All of the evidence-based principles underlying effective WMS reflect this need for an integrated continuum of services: namely, the stepped care approach; the importance of screening, assessment and triage (which may be coordinated across different service providers); the provision of comprehensive supports (which goes beyond substance use/addiction services

specifically); health equity considerations generally; and evaluation, performance measurement and continuous improvement). When planning for an integrated continuum of services, there are several population groups that require special consideration to ensure equitable health access and outcomes.

9.3 WMS within the context of primary health care settings

- Primary care providers should play a central role in an individual's withdrawal management care and ongoing recovery journey since they are uniquely positioned to identify substance use issues early on and to assess the need for specialized supports, including WMS. Depending on the severity of symptoms, primary care providers may be directly involved in managing withdrawal in the community as well as serve as an important long-term resource for coordination of services and follow up.

- There continues, however, to be a gap between this need and capacity to address substance use issues in primary care settings and actual practice. Challenges include payment/fee structures that may not adequately reimburse physicians for their work in this area and real or perceived lack of support. In this regard, it is critical that primary care physicians have access to expert consultation when needed, including addiction medicine specialists and psychiatry.

- With respect to the direct delivery of WMS, there is consensus amongst experts that office-based withdrawal management is clearly within the scope of practice of primary care providers for individuals with less severe withdrawal profiles. Overall, capacity within primary care for substance use/addiction, including WMS, can be enhanced through their initial training, continuing education, and a range of knowledge translation resources. Many such resources are currently available and summarized in the report.

- In instances where WMS is offered outside the context of a primary care setting, timely transitions back to primary care and other services and supports is critical. This is greatly facilitated through a collaborative team approach whereby WMS staff engage the primary care provider in the assessment, wellness planning and transition planning processes. In instances

where a client does not have a primary care provider, WMS staff should facilitate such a connection within the individual's community, wherever possible.

9.4 Treatment approaches for withdrawal management

- The precise regime for withdrawal management is very substance specific. One common element is the strong focus on assessing the severity of withdrawal symptoms and other factors so as to make the appropriate choice for optimal assignment to the right level of WMS in the stepped care model. Further, like screening and assessment, individual treatment and support services must be culturally sensitive/safe, trauma-informed, individualized, person/family-centered, and conducted in partnership with the individual and family.

- Additionally, regardless of substance, the effectiveness of any WMS will be influenced by the relative emphasis on pharmacological strategies (i.e., using medications to help manage withdrawal), psychosocial strategies (i.e., using cognitive/behavioural, counselling and/or psychosocial supports), or a combination of both approaches. Provision, therefore, needs to be made for a full spectrum of such interventions. There should also always be a focus on motivational interviewing and counselling, as required, and attention to social determinants such as housing and food access.

- Regardless of the substance of concern, severity of withdrawal and WMS model deployed, a variety of factors related to the social determinants of health and potential mental health issues can influence overall recovery. This calls for additional elements to the screening and assessment process as well as a range of flexible elements to the overall treatment plan to address individual needs and strengths.

- Withdrawal from stimulants such as methamphetamines, while not life threatening, can be challenging to manage due to the wide variety of symptoms, including depression, sleep disturbances, fatigue, anxiety, irritability, poor concentration, psychomotor retardation, increased appetite, paranoia and drug craving. The significant mental health challenges require close assessment and observation as well as careful program environmental design to ensure

low levels of stimulation as well as to ensure staff safety. The lengthy period of withdrawal over distinct primary and secondary phases, accompanied by severe craving, also makes it especially difficult to manage. In the absence of seamless connections to treatment and supports following withdrawal management, relapse and frequent admissions for WMS can often be anticipated.

- With respect to cannabis, it is important to recognize the significant evidence confirming the existence of a distinct withdrawal syndrome that requires services and support to be effectively managed. With the recent legalization of recreational use of cannabis products, the need for these services is likely to increase as well as corresponding training and education of various health and social service professionals.

9.5 Maintenance/replacement therapy within inpatient WMS settings

- Current national and international guidelines are unequivocal in indentifying that withdrawal management on its own is not recommended for opioid withdrawal syndrome since withdrawal management without immediate transition to long-term evidence-based treatment has been associated with a variety of elevated risks, including but not limited to, risk of relapse and overdose. The literature on withdrawal from opioids also emphasizes the role of outpatient service delivery models unless strongly indicated, and according to specific exclusionary criteria available in national guidelines.

- Relevant guidelines further recommend that individuals with opioid use disorder who wish to discontinue use but for whom long-term opioid agonist treatment is not a preferred option can be slowly tapered in a supervised fashion on an outpatient basis rather than adopting a withdrawal management approach using a rapid inpatient opioid-agonist taper.

9.6 Role of addiction medicine within WMS

- There are several key roles for specialists in addiction medicine, including direct service providers in WMS programs and consultants for primary care and other physicians. For WMS specifically, their role is particularly important for supporting individuals with more severe and complex symptoms and for those with co-occurring health and mental health conditions.

- Addiction medicine specialists are especially critical to the provision of opioid agonist treatment for opioid use disorders. That being said, they should be seen as one member of a multi-disciplinary team that also provides required psychosocial assessment and supports.

- With respect to consultation models for addiction medicine, relevant examples include the Rapid Access to Consultative Expertise (RACE) which began in BC and the Ontario program known as Extension for Community Healthcare Outcomes (ECHO), which began as support for chronic pain management. Similar models can be investigated in other jurisdictions as well as more locally designed models with a small roster of specialists being designated and available in a specific region (such as in North Bay Ontario).

- Many areas experience a challenge with the current supply of specialists in addiction medicine and may need to develop specific strategies for recruitment and retention of physicians, nurse practitioners and other nursing professionals. Physician assistants may be an untapped resource to expand the capacity of medical supports in WMS settings.

9.7 Workforce mix and competencies

- An interdisciplinary team of appropriately trained clinicians and support staff is recommended for WMS with the specific staff mix varying according to the service delivery model, the range and severity of client issues, and the availability of, and degree of integration with, the range of resources available in the service setting and broader community. Primary care providers should be considered a part of the interdisciplinary team, even if not directly involved in the delivery of WMS. Telemedicine can significantly increase the diversity and reach of an inter-disciplinary team.

- In general, more specialized and intensive medical expertise will be required for hospital/complexity-enhanced residential WMS, including access to addiction medicine expertise.

- Consideration also needs to be given to the staffing mix required to deliver ancillary supports and may include staff with specific expertise in substance use/addiction and mental health counselling, system navigation, peer support, spiritual/cultural services, case management (including support for housing, food access and income supplementation) as well as harm reduction services.

- A small number of stakeholders highlighted the potential of telemedicine to extend the reach of WMS in Canada, particularly, to more rural and remote regions where local expertise is often more limited. For example, one addiction medicine specialist described a potential hub and spoke model for service delivery whereby a physician in a centralized location coulmd manage and supervise, via telemedicine, trained personnel in sites spread across a geographic region.

- Core behavioural and technical competencies have been developed for substance use/addiction services generally, and apply equally to WMS. Available materials include resources and culture-based principles for working with First Nations clients. Other competencies include work related to concurrent mental health issues in WMS client populations, staff safety and wellness, crisis-intervention, and addressing stigma and discrimination when delivering WMS services. All of the above competencies should be supported by clear policies and resources for staff training and supervision.

- Jurisdictions that are considering expanding traditional inpatient services to include more community and home-based service delivery will likely require dedicated change management and training resources to support staff and other engaged health professionals who are less familiar/experienced with providing care within the context of these models.

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Appendix A: New Brunswick Detox Withdrawal Management Protocols and Guidelines - Review and recommendations

This appendix presents recommendations for revisions, additions and updates to the 2016 New Brunswick *Detox Withdrawal Management Protocols and Guidelines (*referred to henceforth as the NB protocols/guidelines). It begins with general recommendations that are applicable across two or more sections of the NB protocol/guidelines, followed by section-specific recommendations. All references are provided in the main body of the VIRGO report.

General recommendations

Scope of protocols/guidelines

These guidelines are targeted towards inpatient withdrawal management services (WMS), since this is the only service delivery model currently available in New Brunswick. If the province decides to move towards implementing other WMS models, including more community-based programming, these guidelines would need to be updated to reflect model-specific content. See for example the following guidelines and standards from other Canadian jurisdictions:

- NWT 2014 guidelines
- SK 2012 guidelines
- Ontario 2014 standards
- Kahan 2017a (p. 16)
- Manning et al., 2018; including pg. 73

Detoxification versus withdrawal management

British Columbia's provincial guidelines for biopsychosocialspiritual withdrawal management services (2017) makes the following distinction between withdrawal management and detoxification:

> Withdrawal management is the preferred name for the process that is often referred to as "detoxification" or "detox". Detoxification is only one component of the withdrawal process and refers to the body ridding itself of the chemical effects of the substance(s) that have been used. Withdrawal management, however, implies a more holistic and comprehensive approach to helping someone through withdrawal – one that provides the necessary care during the "detox" process, as well as ongoing supports after the chemical effects of the substance(s) have worn off, to assist the individual to stabilize physically and psychologically, and to connect them with appropriate substance use treatment and other health and social services.

We note that both the language and content of the NB protocol/guideline appears to be focused on "detoxification" as conceptualized above. For example, while there is substantive emphasis on the medical management of physical withdrawal symptoms and complications, there is little to no reference to the other goals of WMS services, and related protocols/guidelines (see also Section 3.0 of report), such as competencies required to provide a psychologically safe environment for clients, and mechanisms to connect clients to substance use/addiction treatment. While this review is limited to the content that is currently reflected in the NB protocol/guidelines, we have noted, below, some potential additional content areas that would expand the focus on withdrawal management as broadly defined above. More comprehensive recommendations to expand the focus is beyond the scope of this review.

- Processes that reflect NB WMS as being part of the larger continuum of health care (e.g., referrals to substance use services, communication back to primary care physician, etc.), as applicable (see also section 4.2.1)
- General processes related to assessment and triage (see section 4.2.2; Manning et al., 2018; Government of Saskatchewan Ministry of Health, 2012), including
    - Determination of level of care required
    - Assessment of mental health issues, assessment of suicide risk
    - Substance use history and disorder diagnosis
- Treatment and discharge planning (see Manning et al., 2018; Ontario 2014 Standards)

- Provider competencies, particularly:
    - CCSA competencies (see also section 4.2.4)
    - Critical incident training/Crisis intervention training (Addictions and Mental Health Ontario, 2014; Canadian Centre of Substance Abuse, 2015)
    - Screening and assessment of mental health issues
- Psychosocial supports provided as part of WMS; see in particular British Columbia Ministry of Health (2017; Addictions and Mental Health Ontario, 2014)

Format, structure and language

- Most references are dated (i.e., more than 20 years old). It is recommended that they be updated and that references be embedded from the VIRGO review within the content itself to facilitate future reviews.
- Page number references embedded in text are inaccurate in places
- Review all language to avoid use of stigmatizing terms (e.g., "opioid addict" page 37, "cocaine abuser" pg. 32)
- The age defining "elderly" varies in several places in the document (either 60 years and older or 70 years and older).
- Recommended additional content:
    - Consider a protocol specific to methamphetamine withdrawal
    - Section 4 (Seizure Risk Reduction Protocol) is largely related to withdrawal from alcohol and benzos; consider moving content to the respective withdrawal protocols for these substances, as applicable.

Section-specific recommendations

Seizure Risk Reduction Protocol (pgs. 3 and 4)

NB Protocol	VIRGO Review
Withdrawal seizures usually begin 8 to 24 hours after the last drink and may occur before the blood alcohol level has reached zero… The peak incidence of withdrawal seizures is within 24 hours after the last drink corresponding to peak abnormalities in EEG readings.	The appearance of acute symptomatic seizures may emerge 6–48 h after the last drink. More than 90% of acute symptomatic seizures emerge within 48 h of cessation of prolonged drinking (Jesse et al., 2016)

Supportive medications / interventions (pgs. 5 and 6)

NB Protocol	VIRGO Review
5.16 Thiamine (vitamin B1) Administered to all clients with a history of alcohol abuse upon admission. Thiamine appears to reduce irritability and depression and is essential for many biochemical processes.	Thiamine is also recommended as a prophylactic measure for Wernicke's Encephalopathy (WE). WE is an acute neuropsychiatric condition commonly seen in individuals who chronically misuse alcohol, and results from brain cell damage due to chronic thiamine deficiency. WE is treated with thiamine supplementation, which is safe, relatively uncomplicated to administer and effective (Thomson et al., 2002). Because of their higher risk of developing WE, oral thiamine supplementation is recommended for all individuals being treated for AWS (Jesse et al., 2017; World Health Organization, 2012).

Signs and symptoms of withdrawal (pg. 9)

NB Protocol	VIRGO Review

Table 1 (Signs and symptoms of withdrawal)	Consider including signs and symptoms of withdrawal from cannabis, especially if a cannabis withdrawal protocol is added to the NB protocol/guidelines.

Determining Dose of Medications (pg. 12)

Consider moving this section to the alcohol withdrawal protocol (pg. 16)

Medications to manage withdrawal from other drugs (pg. 12)

NB Protocol	**VIRGO Review**
Marijuana: "No clinically significant marijuana withdrawal syndrome has been described in the literature. However, some individuals may experience anxiety, depression, irritability, insomnia, tremors or headaches after abrupt cessation of marijuana use."	There is extensive research, including neurobiological, clinical, neuroimaging and epidemiological studies, that have supported adding cannabis withdrawal as a syndrome (cannabis withdrawal syndrome, or CWS) to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) and as a criterion for cannabis use disorder (Livne, Shmulewitz, Lev-Ran, & Hasin, 2019). Symptoms of cannabis withdrawal, while not life threatening (Manning et al., 2018), result in significant distress and functional impairment. Cannabis withdrawal is a common reason to avoid quitting cannabis, or to resume use after attempts to quit or cut back (Schlienz & Vandrey, 2019). **Recommendation:** Consider adding more content related to cannabis withdrawal and/or a separate cannabis withdrawal protocol

Methadone loading protocol (pg. 14)

See related notes below in the 'Opioid Withdrawal Protocol' section.

Alcohol withdrawal protocol

- Recommend moving some earlier sections pertaining to alcohol specifically (i.e., seizure section, dosing section) to this section.
- Potential content to include:
    - Brief section on Alcohol Withdrawal Delirium (AWD); formerly referred to as delirium tremens (DTs) (Manning et al., 2018; Centre for Substance Abuse Treatment, 2006; Kattimani et al., 2013)
    - Brief section on Wernicke's Encephalopathy and Korsakoff's Syndrome (Manning et al., 2018; Kattimani et al., 2013)

NB Protocol	**VIRGO Review**
Clinical Institute Withdrawal Assessment-Alcohol, revised (CIWA-Ar)	Recommend including addition of following caveat re: CIWA-Ar: • "…less reliable in the presence of significant medical or psychiatric comorbidities and is not recommended for severe or complex withdrawal" (Manning et al., 2018). • The scale is not a diagnostic tool as it has not been found to be useful in differentiating between DT and delirium due to medical illnesses (Kattimani et al., 2013) • Appendix A: Revise title to reflect Clinical Institute Withdrawal Assessment-Alcohol, revised (CIWA-A**r**)

Benzodiazepine withdrawal protocol

NB Protocol	**VIRGO Review**
Benzodiazepine dependence	These details seem a bit out of place in the protocol, in part because they are not linked to any specific

	recommendations/guidelines/protocols (as is done in the nicotine withdrawal protocol (see Table 3, pg. 56).
No specific reference to assessment	See related section in VIRGO report, especially: "Monitoring of withdrawal symptoms can be facilitated using symptom scales in conjunction with clinical observation and judgement. It is recommended that self-report not be relied on exclusively to monitor symptoms as symptoms of co-morbid conditions, especially anxiety, may be confused with symptoms of withdrawal (Manning et al., 2018). The Clinical Institute Withdrawal Assessment Scale - Benzodiazepines (CIWA-B) is a 22-item instrument, designed to assess and monitor benzodiazepine withdrawal, that can be administered by well-trained personnel (e.g., physicians and nurses; Busto, Sykora, & Sellers, 1989). Although the CIWA-B is commonly used in substance use treatment settings (Saunders & Yang, 2002, as cited in Manning et al., 2018), its psychometric properties have not been extensively evaluated (Manning et al., 2018). The Benzodiazepine Withdrawal Symptom Questionnaire (BWSQ, Tyrer, Murphy & Riley, 1990) is a 20-item self-report instrument that also records the main symptoms during withdrawal from benzodiazepines. The BWSQ was found to be reliable in studies involving pharmacologically dependent individuals (Tyrer et al., 1990) and depressed chronic benzodiazepine users in primary care treatment settings (Couvee & Zitman, 2002). The latter study also confirmed some construct and predictive validity."
Benzodiazepines (pg. 25) In the elderly (70 years of age and older) and /or patients with substantial liver disease LORazepam is the more appropriate agent to use.	Elsewhere in the NB protocols/guidelines, an elderly individual is defined as 60 years or older. The CCSA 2014 review pertaining to benzodiazepline withdrawal amongst seniors notes that the age range in research is variably defined as either 60 years or 65 years and older.
No reference to conversion rates for diazepam based on presenting benzodiazepine use.	Manning et al., 2018: Calculation of total dose of benzodiazepines used daily and conversion to a longer acting benzodiazepine is required prior to commencing withdrawal. Without conversion to longer acting benzodiazepines, clients can experience withdrawal symptoms or rebound anxiety throughout the day. See conversion tables provided to assist in conversion to diazepam.

	But… While some clinical guidelines (e.g., Manning et al., 2018; National Health Service, 2019) recommend first switching to a longer acting benzodiazepine (typically diazepam), Soyka (2017) noted that the fundamental advantages of this approach is unclear and that it has not been found to be associated with better outcomes.
Phenobarbital (pg. 17) Occasionally some patients will experience a reaction to benzodiazepines, which is the opposite of what is expected (known as paradoxical excitation). If this occurs, all benzodiazepines should be discontinued and PHENobarbital substituted.	Jesse et al., 2016: "Barbiturates are also GABA-enhancing drugs that work synergistically with benzodiazepline (BZD) featuring a different receptor profile. They can be given orally or intravenously with a loading dose of 100–200 mg/h and have been shown to be as effective as BZD. Unfortunately, barbiturates have a narrow therapeutic index with a long half-live making titration difficult. They increase the likelihood of respiratory insufficiency and coma so that intubation and mechanical ventilation is often necessary. Because there is no antidote to toxicity, barbiturates are not used frequently in the therapy of AWS. Centre for Substance Abuse Treatment (2006): "In clinical practice, the medication is effective both for the treatment of alcohol withdrawal and sedative-hypnotic withdrawal although few controlled trials have been conducted with it (Wilbur and Kulik 1981). Phenobarbital has a long half-life and may rapidly accumulate. Overdoses with phenobarbital also can be fatal. Members of the consensus panel recommend its use only in highly supervised settings."

Cocaine Withdrawal Protocol

NB Protocol	**VIRGO Review**
Benzodiazepines: In the elderly (70 years of age and older) and/or patients with substantial liver dysfunction (see Alcohol Withdrawal	See also 'Benzodiazepine withdrawal protocol' Manning et al., 2018 define "elderly" as 65 years and older.

Protocol), LORazepam is the more appropriate agent to use.	
No specific reference to assessment	Because psychiatric disorders are common among stimulant users—particularly depression, anxiety and drug-induced psychosis (Baker, Lee & Jenner, 2004) mental health symptoms should be thoroughly assessed to determine whether they are secondary to stimulant withdrawal or reflect the presence of a comorbid mental health issue. In particular, accurate differential diagnosis of substance-induced psychotic disorder versus the presence of new onset or relapsing psychotic illness is critical to minimizing the risk of medical mismanagement (Grigg et al., 2018; Tang, Martin & Cotes, 2016). Differential diagnosis requires a detailed understanding of the timing of substance use relative to the emergence psychotic symptoms (Tang, Martin & Cotes, 2016). In the case of cocaine use, individuals who develop cocaine-induced psychotic disorder are more likely to be male and younger, have a longer duration and severity of cocaine use, be an intravenous drug user, and have an earlier onset of use (Tang, Martin & Cotes, 2016). The Cocaine Selective Severity Assessment (CCSA; Kampman et al., 1998), an 18-item, clinician-administered instrument, was found to be a reliable and valid measure of cocaine early withdrawal symptoms. It was also found to be useful in predicting negative outcomes in cocaine dependence treatment.
No specific reference to potential for psychotic symptoms as part of withdrawal.	About one half to three-fourths of individuals who abuse cocaine will also experience transient psychotic symptoms. A smaller subset of these individuals develop a cocaine-induced psychotic disorder, characterized by psychotic symptoms that persist for a longer duration and are of greater severity than would would be expected in cocaine intoxication or withdrawal. The symptoms of this disorder include auditory and visual hallucinations, paranoia, violence and aggression, and simple or complex repetitive behaviours (e.g., picking at clothes, drawing or writing (Tang, Martin & Cotes, 2014). In the case of psychotic symptoms and associated agitation, the initial focus of pharmacotherapy should be on keeping the patient and staff safe (Tang, Martin & Cotes, 2014). Benzodiazepines are recommended as first-line therapy for agitation (American

	Psychiatric Association, 2010; Tang Martin, & Cotes, 2014). If agitation does not settle, atypical antipsychotic may be administered, either on their own, or in conjunction with benzodiazepines. Antipsychotic mediations are also recommended in cases where the diagnosis is unclear between cocaine-induced and primary psychotic disorder. Their use should be continued only until their sedative effect is evident, and they can usually be discontinued within the first 72 hours of withdrawal (Tang, Martin & Cotes, 2014).

Opioid Withdrawal Protocol

It is recommended that this protocol be reviewed in light of the national guidelines released in 2018 by the Canadian Research Initiative on Substance Misuse (CRISM), which recommends against facilitated withdrawal from opioids as a standalone option (see also below).

NB Protocol	VIRGO Review
"Any person withdrawing from opioids and exhibiting symptoms can be considered for withdrawal using the medications outlined in this protocol."	While medical management has been shown to be more effective than placebo in reducing the severity of withdrawal symptoms and drop-out rates, most individuals relapse to opioid use if treatment is not linked to long-term substance use/addiction treatment. And because withdrawal management lowers tolerance to opioids, these individuals are then at increased risk of fatal overdose when they do return to opioid use (Canadian Research Initiative on Substance Misuse, 2019). Medically supervised withdrawal management is also not recommended during pregnancy due to similar high rates of relapse and increased risk of adverse outcomes that are more severe and longer-lasting than those associated with neonatal abstinence syndrome (NAS; CRISM, 2018). For these reasons, recent national guidelines, released by the Canadian Research Initiative on Substance Misuse (CRISM; 2018), included a clear message that "**withdrawal management alone is not an effective nor safe treatment for OUD, and offering this as a standalone option to patients is neither sufficient nor appropriate**". Withdrawal management not recommended for pregnant women due to increased risk of relapse (CRISM 2018) **First- and second-line treatment options** 1. Initiate opioid agonist treatment (with buprenorphine–naloxone whenever feasible), to reduce the risk of toxicity, morbidity and death, and to facilitate safer take-home dosing (strong recommendation; high-quality evidence). 2. For individuals responding poorly to buprenorphine–naloxone, consider transition to methadone treatment (strong recommendation; high-quality evidence). 3. Initiate opioid agonist treatment with methadone when treatment with buprenorphine–naloxone is not the

	preferred option (strong recommendation; high-quality evidence). See all recommendations in Bruneau et al., 2018 See Table 1 in CRISM 2018 guidelines (starting pg. 31) re: comparison of advantages and disadvantages of methadone and buprenorphine.
Signs and symptoms	Recommend highlighting the high risk of relapse following withdrawal. See, for example, Manning et al., 2018: "…the risk of relapse post-withdrawal is high, and given the markedly reduced levels of physiological tolerance post-withdrawal, so is the risk of overdose.
The pharmacological management of opioid withdrawal involves codeine and a benzodiazepine or methadone (pg. 37) Dosing schedules for opioid withdrawal (starting page 41).	Bruneau et al., and CRISM 2018: See recommendations above. When withdrawal management (without transition to opioid agonist treatment) is pursued, provide supervised slow (> 1 mo) opioid agonist taper (in an outpatient or residential treatment setting) rather than a rapid (< 1 wk) taper. During opioid-assisted withdrawal management, clients should be transitioned to long-term substance use/addiction treatment to help prevent relapse and associated health risks. See also Chang et al., 2018 re: dangers of rapid tapers
Dosing schedules for opioid withdrawal using methadone (pg. 41)	See CRISM guidelines (2018), beginning page 62, for a comparison of dosing schedules by province. For example, most provinces specify a starting dose based on risk of toxicity (New Brunswick does not).
Dosing schedules for opioid withdrawal using codeine (Table 6, page 44)	Use of codeine for the treatment of opioid withdrawal syndrome is not reflected in CRISMs 2018 national clinical guidelines.
No specific reference to harm reduction strategies.	Given the significant risk of relapse and overdose, the following recommendations are applicable: Bruneau et al., 2018: National guideline: Information and referrals to take-home naloxone programs and other harm reduction services (e.g., provision of clean drug paraphernalia), as well as other general

	health care services, should be routinely offered as part of standard care for opioid use disorders. Manning et al., 2018: Opioid overdose risk should be considered as part of withdrawal care planning. Naloxone provision should be offered as part of discharge planning for every opioid withdrawal episode.
No specific reference to special considerations as it relates to prescription opioid dependence and chronic pain management	Manning et al., 2018: Individuals with a history of chronic non-malignant pain require adequate assessment and treatment planning regarding pain management prior to withdrawal from prescription opioid(s)
References	Add CRISM 2018 guidelines

Nicotine Withdrawal Protocol

NB Protocol	VIRGO Review
Signs and symptoms of nicotine withdrawal	Consider including DSM-V diagnostic criteria: 1) Daily tobacco use lasting several weeks; 2) Sudden cessation or reduced tobacco use leading to four (or more) of the following symptoms within a 24-hour period: • Irritability, frustration, or anger • Anxiety • Difficulty concentrating • Restlessness • Increased appetite • Depressed mood • Insomnia 3) The signs or symptoms in criterion b cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. 4) The signs or symptoms are not attributable to another medical condition and are not better explained by another mental disorder, including intoxication or withdrawal from another substance.
Nicotine Replacement Therapy (NRT) Nicotine replacement therapy (NRT) medications include: Nicotine gum; Nicotine transdermal patch; or nicotine inhaler	Newer options include nicotine mouth spray and lozenges. Recommend a table summarizing and comparing NRT options (see for example: HIVclinic.ca, https://www.uptodate.com/contents/pharmacotherapy-for-smoking-cessation-in-adults#H3735107539 Since NRT is generally a longer-term treatment, consider adding details re: discharge planning and access to NRT on an outpatient basis.
NICODERM 10 Week Program Table 4 (pg. 57)	Step 1: revise to specify 10 or more cigarettes. Suggest revising this table to separate out steps for heavy versus lighter smokers. For example, as per the Nicoderm website (https://www.nicoderm.ca/how-to-quit/how-to-quit-smoking-light-smokers), light smokers should start and stay at Step 2 for weeks 1-6 and then move on to Step 3 (for weeks 7 and 8).

	Also this table was supposed to compare Nicoderm and Habitrol patches (the doses are the same for Habitrol but the dosing schedule covers 8 weeks instead of 10). See also: https://habitrol.com/
Nicotine inhaler	Provide instructions re: use and dosable as done for other forms of NRT? See: https://www.nicorette.ca/products/inhaler
Medications varenicline (CHAMPIX) bupropion (ZYBAN)	Include details re: why these medications are used (varenicline: which reduces withdrawal symptoms and smoking satisfaction by preventing attachment of nicotine to certain nicotine receptors (Reid et al., 2016); buproprion: a non-competitive antagonist of nicotinic acetylcholine receptors that also inhibits uptake of dopamine, serotonin, and noradrenaline to reduce cravings and other withdrawal symptoms; Hersi et al., 2019).
No references/suggested reading	Recommend adding references, including those sited in the body of the protocol. Reid et al., 2016

Appendix B: Key informants

Name	Role Agency	Jurisdiction
Dr. Valerie Primeau	Psychiatrist North Bay Regional Health Centre	Ontario
Dr. Kim Corace	Director of Clinical Programming and Research The Royal	Ottawa, Ontario
Cheryl MacNeil	Consultant Mental Health & Addictions Nova Scotia Health Authority	Nova Scotia
Lynn Lowe	Consultant Mental Health & Addictions Nova Scotia Health Authority	Nova Scotia
Dr. Sherry Mumford	Consultant Mumford Consulting	British Columbia
Dr. Heather Logan	Physician, Horizon, NB	New Brunswick
Janice Kramp	(Former) Senior Manager, Member Relations and Projects, Addictions and Mental Health Ontario (AMHO)	Ontario
Linda Sibley	Executive Director Thames Valley Addiction Services	Ontario
Sean Leggett	Program Analyst Manitoba Health, Seniors and Active Living Mental Health and Addictions	Manitoba
Dr. Joel Tremblay	Directeur scientifique; RISQ (Recherche et intervention sur les substances psychoactives), Université du Québec à Trois-Rivières	Quebec
Dr. Peter Selby	Clinician Scientist, Addictions Division and Chief of Medicine in Psychiatry Division	Ontario
Dr. Jonathan Bertram	Staff Physician Addictions Medicine Service CAMH Board of Directors, Ontario College of Family Physicians (OCFP) Consulting Physician PSSP CAMH- First Nations Outreach Addictions & Pain Physician Bowmanville Family Health Organization (FHO) Consulting Physician Community	Ontario

	Outreach Programs in Addiction (COPA)- Reconnect Mental Health Services	
Brent Laybolt	Team Lead - WMS in Lunenburg Withdrawal Management Unit Fishermen's Memorial Hospital Nova Scotia Health Authority	Nova Scotia
Dr. Sam Hickcox	Physician, Nova Scotia Health Authority (NHSA), Mental Health and Addictions; NSHA Mental Health and Addictions Physician Lead: Addictions Medicine; Director: Atlantic Mentorship Network for Pain and Addictions	Nova Scotia

Appendix C: Criteria for allocation to the Needs-Based Planning severity tiers

Level of Need	Definitions for Substance Use Severity Tiers
Tier 1	No CIDI alcohol **-or-** drug disorder **-and-** No non-cannabis illicit drug use **-and-** Prescription drug use only as prescribed **-and-** No perceived need for care **-and-** Drinking below **(our approximation to)** the low-risk guidelines: Men: Up to 15 drinks per week; Up to 3 drinks per day most days Women: Up to 10 drinks per week; Up to 2 drinks per day most days **-and-** Cannabis use: never, **-or-** just once (past 12m or lifetime), **-or-** more than once > 12m ago, **-or-** more than once in the past 12m **and** frequency was < once a month.
Tier 2	One <u>abuse</u> problem (out of 4) related to alcohol **-or-** cannabis **-or-** other drugs excl. cannabis, 12m **OR** Binge drinking (5+ drinks on one occasion), *once a month* **-or-** *2-3 times a month* **-or-** *once a week* **-or-** *more than once a week* **OR** Drinking above the LRDG: Men: (> 3 drinks per day on most days

	-or- >15 drinks per week**)** Women: **(**>2 drinks per day on most days **-or-** >10 drinks per week**)** **OR** Any drug use, 12m, excl. one-time cannabis use **OR** Any prescription drug use not as prescribed **OR** Cannabis use more than once in the past 12m, **-and-** frequency was once a month or more.
Tier 3	**(**2–4 abuse problems **-or-** 1–2 dependence problems on any one (or more) of alcohol **-or-** cannabis **-or-** other drugs, 12m**)** **OR** Perceived need for care *(needs partially met* **-or-** *needs not met).*

Tier 4	**(**12m alcohol dependence **-or-** 12m cannabis dependence **-or-** 12m drug dependence excl. cannabis**)** [AUDDYD or SUDDYCD or SUDDYOD]
Tier 5	**Dependence and interference is required, and then either one of the two sets after AND, separated by -OR-, is required:** {**(**12m alcohol dependence **-or-** 12m cannabis dependence **-or-** 12m drug dependence excl. cannabis [AUDDYD or SUDDYCD or SUDDYOD] **-and-** Sheehan Disability Scale >=4.**)** (*AUDFINT=1* **-or-** *SUDFINT=1 (signif. interference)* **AND** **(**2+ CIDI disorders, 12m, that are not alcohol or cannabis or drugs (counts major depressive episode, bipolar I, bipolar II, hypomania, GAD) **-and-** Sheehan Disability Scale >=4**)**. MHPFINT=1 *(signif. interference)* **-and-** **(**1+ chronic condition *(out of 7)* **-or-** WHO_DAS=high *(90th pctile)***)**

	-OR- **[(**Self-reported schizophrenia **-or-** Self-reported psychosis **-or-** CIDI Bipolar I**)** **-and-** **(**1+ chronic condition *(out of 7)* **-or-** WHO_DAS=high *(90th pctile)***)]}.**