



Opioid agonist therapy trajectories among street entrenched youth in the context of a public health crisis

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ABSTRACT

North America is in the midst of an overdose crisis that is having devastating effects among street entrenched youth (<30 years of age). Opioid agonist therapy (OAT) is a cornerstone of the public health response to this crisis; yet, we struggle to connect youth to OAT across numerous settings. This qualitative study examined perspectives on OAT among street entrenched youth and their providers in Vancouver, Canada. Our findings reveal youth's hopes and fears surrounding making a "full" recovery from past substance use. Youth often equated getting off opioids with "getting back to normal" and the ability to pursue "normal" kinds of futures. While many initiated OAT for short periods of time (<one month) to mediate the discomfort of withdrawal during in-patient treatment, adherence to medications like methadone and buprenorphine over the longer term did not fit with many youth's visions of "normal" futures. A number of polysubstance using youth did not access OAT, despite its lifesaving potential. Youth who did access OAT often preferred methadone because of its perceived ability to mediate longstanding physical and mental health issues. Participants who accessed OAT had the most success with adherence when they were invested in this treatment modality and actively involved in decision making around what kind of medication would work best for them, and for how long. In the absence of this collaboration, many youth made the decision to taper off of OAT independently, frequently resulting in relapse and heightened overdose risk.

Introduction

Across North America, the emergence of illicitly manufactured fentanyl and its analogues in drug markets has resulted in dramatic increases in overdoses, including among youth (<30 years of age). In 2018, approximately 46% of overdose deaths in the United States (National Institute on Drug Abuse, 2020) and 87% of overdose deaths in the Canadian province of British Columbia (BC; BC Coroners Service, 2020) involved fentanyl. Youth ages 15 to 24 represent the fastest growing age demographic for hospitalizations due to opioid poisoning in Canada (BC Coroners Service, 2020; Canadian Institute for Health Information, 2016), while in BC, more than 1000 youth ages 10 to 29 have lost their lives to overdose since an official public health emergency was declared in 2016 (BC Coroners Service, 2020; Government of Canada, 2018). Youth who use drugs in the context of street entrenchment (i.e., those

experiencing homelessness or without stable housing, frequently in the context of other kinds of overlapping exclusion along axes of race, class, sexual orientation and gender identity) are particularly vulnerable to fatal and non-fatal overdose and a myriad of other harms (Hadland et al., 2014; Kerr et al., 2009; Lyons, Yule, Schiff, Bagley, & Wilens, 2019; Mitra, Wood, Nguyen, Kerr, & DeBeck, 2015; Ochoa, Hahn, Seal, & Moss, 2001; Werb, Kerr, Li, Montaner, & Wood, 2008).

Opioid agonist therapy (OAT) is a cornerstone of the public health response to the overdose crisis. As one of the regions hardest hit by this crisis, Vancouver, Canada, is significantly expanding efforts to create a comprehensive drug treatment system for vulnerable youth that spans acute and community healthcare settings, including clinics, hospitals, and residential detox, treatment, and recovery settings. Central to these efforts is the expanded provision of OAT to youth, namely methadone and buprenorphine/naloxone (buprenorphine; referred to by the brand

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name Suboxone in some of the quotes below). Notably, in 2015 the Vancouver Health Authority issued new clinical practice guidelines that recommend buprenorphine as a first line treatment for opioid use disorder (OUD), including among youth (BC Centre on Substance Use and BC Ministry of Health, 2017; Vancouver Coastal Health, 2017). The local health authority has rolled out a new Youth Intensive Case Management Team staffed by nurse practitioners and other healthcare professionals, which provides substance use care, including OAT, to youth across in- and out-patient community healthcare settings (e.g., drop-in centers, residential treatment centers; Vancouver Coastal Health, 2017). Addiction medicine consult teams have been created at local hospitals in order to similarly improve the integration of OAT into hospital settings (Providence Health Care, 2016a, 2016b; Vancouver Coastal Health, 2017; Vancouver Sun, 2018).

Methadone has long been an established pharmacotherapy for reducing problematic opioid use and attendant harms (Amato et al., 2013; Ball & Ross, 1991; Dole & Nyswander, 1965; Metzger et al., 1993; Zanis et al., 1998). Compared to methadone, buprenorphine has been associated with improved educational and employment outcomes, lower relapse rates, higher therapy retention rates, lower likelihood of misuse, and lower likelihood of overdose (Amass, Ling, Thomas, Freese, & Jeffrey, 2004; Bell, Butler, Lawrance, Batey, & Salmelainen, 2009; Fudala et al., 2003; Johnson et al., 2000; Kakko, Svanborg, Kreek, & Hellig, 2003). However, there continues to be limited research examining the acceptability, appropriateness, and effectiveness of both methadone and buprenorphine for treating OUD among youth, including for preventing overdose in the context of the current crisis (Minozzi, Amato, Bellisario, & Davoli, 2014). A small number of previous clinical studies point to the benefits of extended OAT maintenance (>2 weeks) for youth experiencing OUD (Marsch et al., 2005; Woody, Poole, Subramaniam, Dugosh, & Bogenschutz, 2008), while qualitative studies have demonstrated that youth may view medications, and specifically methadone, as a means of maintaining abstinence from opioid use (Boyd, Fast, Hobbins, McNeil, & Small, 2017; Guarino et al., 2009).

It is generally recognized that youth face numerous barriers to accessing OAT, including stigma from care providers, long wait times, and age restrictions (Barker, Kerr, Nguyen, Wood, & DeBeck, 2015; Greenfield, Owens, & Ley, 2014; Hadland, Park, & Bagley, 2018; Phillips, DeBeck, Desjarlais, Morrison, & Feng, 2014; Yang, Oviedo-Joekes, Christian, Li, & Louie, 2011). There also continues to be significant debate surrounding the appropriateness of OAT for youth. Many providers are concerned about the indefinite duration of OAT for younger individuals – particularly for those who have been using opioids for relatively short periods of time prior to treatment, or with milder OUD (Fischer, Murphy, Rudzinski, & MacPherson, 2016). It has been argued that more conservative treatment options (e.g., psychosocial in- and out-patient treatment, perhaps combined with shorter term OAT and tapering) should be attempted prior to putting youth on OAT over the longer term (Fischer et al., 2016). Alternatively, others have highlighted the hazards of a more conservative approach given the current crisis, and argued strongly for the lifesaving potential of longer term OAT for youth in this context (Borodovsky, Levy, Fishman, & Marsch, 2018; Hadland, Wood, & Levy, 2016; Matson, Hobson, Abdel-Rasoul, & Bonny, 2014). Regardless, the longer term uptake of OAT among youth remains low in many contexts (Feder, Krawczyk, & Saloner, 2017; Phillips et al., 2014; Wu, Zhu, & Swartz, 2016).

In addition to youth who use opioids exclusively, it is increasingly recognized that polysubstance using youth, including primarily stimulant using youth, are also vulnerable to overdose. For example, from 2016 to 2019 in BC, 34% of fatal overdoses involved crystal methamphetamine (meth) and 50% involved cocaine (BC Coroners Service, 2020). In this and other similar settings, youth, and street entrenched youth in particular, evidence higher rates of polysubstance use compared to adults (Fairbairn et al., 2007; Uhlmann et al., 2014). In Vancouver, polysubstance use among youth has been associated with heightened vulnerability to initiating injection drug use and overdose

(Uhlmann et al., 2014). And yet, many questions remain regarding how to appropriately treat polysubstance use and in particular primarily stimulant using youth in the context of the current crisis (Guarino et al., 2009; Hadland et al., 2018). It is unclear whether and under what circumstances OAT could be an appropriate, acceptable and effective part of the treatment plan for this youth population.

Co-occurring substance use and psychiatric disorders are also common among youth who use drugs, and particularly those experiencing street entrenchment (Boivin, Roy, Haley, & Galbaud, 2005; Bukstein & Horner, 2010; Litz & Leslie, 2017). Co-occurring disorders have been associated with the development of adolescent substance use disorders (SUD), including OUD (Armstrong & Costello, 2002; Bukstein & Horner, 2010). Additionally, co-occurring disorders have been linked to higher rates of substance use relapse and recurring SUD (Armstrong & Costello, 2002; Myers, Brown, & Mott, 1995; Tomlinson, Brown, & Abrantes, 2004). For individuals who use opioids, psychiatric comorbidity is also associated with increased rates of non-adherence to OAT (Litz & Leslie (2017) However, there remains a paucity of research exploring the effectiveness of OAT in the combined treatment of psychiatric and substance use disorders, and a lack of consensus among care providers surrounding how to accurately diagnose both disorders, as well as which to treat first.

Given ongoing debates surrounding the acceptability, appropriateness, and effectiveness of OAT for youth who use opioids, as well as for polysubstance using youth and those with concurrent substance use and psychiatric disorders, we undertook the present study to investigate youth's perspectives on OAT in the context of ongoing street entrenchment. Specifically, we explored perceptions of buprenorphine and methadone among youth and their providers, in a setting where access to OAT is being rapidly scaled up. Our goal was to identify how the delivery of OAT could be improved to better meet the needs of vulnerable youth who use opioids in this setting, where an unprecedented overdose crisis has claimed the lives of more than 1000 youth since 2016 (BC Coroners Service, 2020).

Methods

Forty-eight semi-structured, in-depth qualitative interviews were conducted from March 2017 to February 2019 with 40 youth between the ages of 17 and 26 (7 youth completed one or more follow up interviews). All of these youth had used heroin/fentanyl intensively (2 or more times per week) and undergone some form of drug treatment (e.g., OAT, in-patient detox and recovery programs, out-patient Twelve Step programs) in the previous 6 months at the time of their first interview. It should be noted that while some youth still referred to using "heroin," or stated more generally that they used "down" (a slang term for illicit opioids), it is generally recognized that illicit opioids obtained in Vancouver's street based drug markets now consist primarily of illicitly manufactured fentanyl (it is for this reason that we use the term "heroin/fentanyl" in various places throughout this paper). All youth had encountered some form of OAT over the course of their treatment trajectories, whether in the sense that it had been explicitly offered to them by a care provider or they had simply heard about it while attending in- and out-patient treatment. Thirty-four youth had tried some form of OAT across their lives.

All youth participants were recruited from a prospective cohort of over 1000 street entrenched, substance using youth known as the At-Risk Youth Study (ARYS), which has been described in detail elsewhere (Wood, Stoltz, Montaner, & Kerr, 2006). We also conducted 13 interviews with 12 youth focused care providers (1 provider completed a follow up interview), including 6 family physicians, 1 nurse practitioner, 1 nurse, 2 drug and alcohol counselors, and 2 social workers. Service providers were recruited by the senior author (DF), drawing on her ongoing relationships with those working in the field of youth treatment and care.

Interviews were undertaken by a medical anthropologist (DF) and

research coordinator trained in qualitative interviewing (MT), and facilitated by the use of semi-structured interview guides. Interviews with youth were designed to elicit detailed timelines and broad discussions of their treatment trajectories. For interviews with providers, we sought to elicit their experiences on a rapidly transforming treatment landscape in Vancouver. Interviews with youth and providers lasted between 60 and 90 minutes. All participants provided their written informed consent, and youth participants were compensated with a \$30 honorarium.

Interview findings and emerging analyses for this study were triangulated by drawing on the first author's clinical experience (e.g., while working at a rapid access addiction clinic located in a large inner city hospital, and in numerous community health centers since 2016), as well as the findings of a program of anthropological research conducted by the last author since 2007 with street entrenched youth and their providers in Greater Vancouver. This anthropological research program has included hundreds of hours of fieldwork in acute and community healthcare settings located throughout Greater Vancouver. As is common in qualitative and ethnographic approaches, data collection and analyses occurred concurrently as the study progressed. Interviews were transcribed verbatim, anonymized, and checked for accuracy. ATLAS.TI software was used to code and manage the data. An initial codebook was generated by DF and MT that captured broad emergent themes (e.g. "experiences with OAT"). Subsequent fieldwork and in-depth interviews were used by the study team to refine the codebook through the addition of new codes (e.g., "OAT and 'getting back to normal'"). Over the study period, evolving interpretations of the data were discussed with youth in the field by DF, and more formally during subsequent in-depth interviews conducted by DF and MT. In addition, the research team discussed the content of interviews and fieldnotes throughout the data collection and analysis processes. Two youth co-researchers (KS and HA) assisted with member checking emerging findings and final analyses. We use narrative excerpts from a small number of interviews to highlight themes we identified across interview accounts and fieldnotes. All participant names appearing below are pseudonyms.

Findings

Youth interview participants included 23 young men, 14 young women, and 3 non-binary youth (gender was self identified by youth). The median age of youth participants was 21. Twenty-six participants self identified as White, 3 self identified as Indigenous, 1 self identified as African Canadian, 1 self identified as Middle Eastern, 7 self identified as being of mixed ethnicity, and 2 did not want to identify their race or ethnicity.

Our findings reveal youth's hopes and fears surrounding making what they framed as a "full" recovery from past substance use. A "full" recovery and the kinds of "normal" futures youth for consistency envisioned for themselves were generally understood to be incompatible with long term adherence to OAT. Youth who did envision staying on OAT for longer periods of time expressed a preference for methadone because of its perceived ability to mediate longstanding physical and mental health issues. A number of polysubstance using youth did not access OAT, despite its lifesaving potential. Participants who accessed OAT had the most success with adherence when they were invested in this treatment modality and actively involved in decision making around what kind of medication would work best for them, and for how long.

A "normal" future: The undesirability of long term pharmacotherapies

All youth participants met the criteria for OUD within the 6 months preceding their first interview, defined under DSM-V criteria as opioid use patterns leading to severe health or social consequences (American Psychiatric Association, 2013). Many had been using opioids several

times daily for a number of years and had experienced multiple non-fatal overdoses and other drug related health crises during the previous year. As we describe below, at least one participant died of an overdose during the study. Despite the severe consequences of their past drug use, youth's descriptions of accessing drug treatment, including OAT, consistently highlighted hopes regarding their ability to make what they envisioned as a "full" recovery. While Vancouver's evolving youth treatment system offers a continuum of services ranging from harm reduction to abstinence focused programming, youth generally equated undergoing successful treatment and "full" recovery with achieving complete abstinence from drug use, and a sense of "getting back to normal." Youth described how complete abstinence would allow them to pursue "normal" kinds of futures, which included moving into desirable housing, pursuing meaningful work, finding a romantic partner, having pets and children, and the opportunity to engage in leisure activities and travel. As 20-year-old Jake explained after two recent stays in a 21-day residential treatment program over the previous year:

I'm pretty blessed that, like, I'm going through this at, like, 20 years old and you know, if I get my shit together right now, you know, like, I can still have a future, right? I can still have a family. I can still have a house. You know, I can still travel. (White Man)

Given the way that youth imagined their futures, the idea that their drug use constituted a "chronic disease" or that prior drug use may have caused irreversible physical and/or cognitive damage could be highly distressing. Twenty-four-year-old Mason recalled that he had been on methadone for five months when he met with a physician to discuss his desire to taper off of it. During their conversation, the physician informed him – perhaps in an effort to applaud the fact that he had been on methadone and abstained from illicit opioid use for five months – that he was "not going to heal any more" from his prior substance use. Mason, however, interpreted this statement as confirmation that he would not be able to "heal" completely from his former drug use. He went on to explain:

That's when I just *snapped* [i.e., stopped methadone and relapsed on heroin/fentanyl]. It's like, if I can't heal, I've got permanent brain damage. After that [conversation with the physician] I was just like: destruct. I wish I didn't start [using opioids], like, really badly. Because it's just, like, something you can't go back on. I finally realized, like, you have damaged your brain and it's just, like, stop trying to get what you had before back. (White Man)

In the absence of being able to "heal completely" from his former drug use, Mason did not view five months on methadone as a success. Rather, he and many other youth viewed OAT as a short term tool that could mediate painful withdrawal symptoms and jump start their "full" recovery from illicit drug use, which would ultimately be achieved without any pharmacological intervention. Longer term use of OAT, which includes the requirement to submit to daily witnessed doses at a pharmacy and frequent urine drug screens in order to eventually be eligible for "carries" (multiple take home doses), did not fit with youth's visions of a "normal" future free from substance use. Jake explained why he decided against initiating buprenorphine during a stay in treatment:

Suboxone was more of a longer term option and I was seeking more short term at the time. I just look at Suboxone like liquid handcuffs. I have to go get it every day [at the pharmacy], I have to work towards carries, it would make my life difficult – the things I could do, when I could do them, how I could do them. Instead, I pictured coming out [of the treatment facility] clean and sober and staying that way. (White Man)

In addition to envisioning treatment, including OAT, as a short term event, many youth also expressed concerns that the longer term use of OAT could actually impede their ability to "fully" recover from drug use. Regardless of whether youth had been on OAT or simply heard about it,

they often described it as having numerous negative side effects. Common complaints were that OAT “made you lose all your teeth,” “ate away your bones,” and “made you feel zombie-ish.” Moreover, youth viewed going on OAT as “replacing one kind of drug with another,” noting that methadone in particular “still got you high.”

Narratives from providers echoed youth’s concerns about the appropriateness and acceptability of OAT over the longer term for youth, even as they consistently acknowledged that the push to get youth on buprenorphine was warranted in the context of the current overdose crisis. As one physician described:

We get many kids coming in who say ‘No, I don’t want to be on methadone, I don’t want to be on Suboxone, I want to be done.’ It’s like either zero or one hundred. And since we are no longer allowed to do tapers, what we can offer is, you either detox cold turkey [at a short term residential facility] – which we know puts youth at risk for relapse and overdose when they leave – or you go on Suboxone or methadone. I understand the clinical reasoning behind [the new treatment guidelines that recommend buprenorphine as a first line treatment]. You know, with kids dying we want to keep them alive. But when you’re a young person who’s being told ‘No, your brain’s been rewired, you have no way to deal with this on your own – willpower is not going to work. We’re going to put you on Suboxone and you are on it until we decide to wean you off of it’ – well, we see the consequences of this approach in the retention rates for youth. It’s miraculous if they stay on it.

I need that extra happiness: The role of OAT in mediating physical and mental health issues

While the majority of youth viewed OAT as a short term means of mediating painful withdrawal symptoms on their way to complete abstinence from all substance use (including the use of pharmacotherapies), a smaller number of youth indicated that they actively sought out OAT, and in particular methadone. Interestingly, around half of these youth viewed OAT not primarily as a treatment for their drug use (although they acknowledged that going on OAT could reduce drug cravings), but rather as a treatment for pressing physical and mental health challenges. Almost all youth participants indicated that they had suffered from anxiety and depression, trauma, and/or serious physical pain across their lives. Among youth who framed OAT as a means to mitigate these mental and physical health issues, methadone was clearly valued over buprenorphine because of its euphoric effects. Mason and a number of other youth described how they skillfully navigated interactions with OAT providers to “get put on a high enough dose of methadone” to reduce physical pain and mental health symptoms. For example, Mason described how, the first time he went on methadone, he actually feigned an opioid use disorder, when in fact the only substance he was using at the time was cannabis. He sought out methadone this first time as a means of moderating his intensive cannabis use and the mental health issues that he understood as motivating it. When he subsequently developed an addiction to heroin/fentanyl, Mason was offered buprenorphine as an alternative to methadone. However, he viewed buprenorphine as undesirable because it was understood to block all sense of intoxication. As Mason explained:

I’ve heard Suboxone is not like methadone, which gets you high. Suboxone just like, kills the craving. It makes you feel normal. But I like to feel high [from methadone] cause it’s just, like, I need that extra happiness. Being sober I’m so unhappy.

Participants who sought out methadone as a means of treating mental and physical health problems were often also concerned about the potentially harmful effects of OAT on their teeth, bones and functioning. In general, youth were very focused on their OAT dosage levels and had strong opinions about the amount that allowed their bodies to

“work better” versus the amount that caused unpleasant side effects (e.g., constipation, excessive sweating), or, worse yet, permanent damage. As one longtime research participant in DF’s broader anthropological study put it, he “took just enough to ease the body from pain.”

All of the providers we interviewed were well aware of the links between substance use and physical and mental health issues among youth experiencing street entrenchment. However, only one physician described how she discussed OAT’s potential to mediate both opioid cravings *and* mental health issues when working with youth experiencing OUD. During her interactions with youth, she described mentioning that buprenorphine could have an anti-depressive effect, and reflected that opening up the conversation in this way could allow for a more meaningful interaction with youth about the intersections between their substance use, mental health issues, and treatment options.

If I was addicted to heroin I didn’t know it: The OAT needs of polysubstance using youth

Many youth participants used stimulants and engaged in opioid use periodically but intensively – for example, “bingeing” on heroin/fentanyl 1 to 3 times a week, particularly during the period of time surrounding “cheque day” (the day of the month when income assistance cheques become available). In a number of cases, these youth indicated that they had not mentioned their opioid use to the various providers that they encountered because it was not “the main problem.” When they did mention it to a provider, or their toxicology screen came up positive for opioids (e.g., at a residential facility), the provider would sometimes recommend that they try OAT as one aspect of their treatment. However, almost all of the polysubstance using youth we interviewed were reluctant to go on OAT, which many largely viewed as “irrelevant” to their needs.

Yet, particularly in the context of the current overdose crisis, youth who use opioids intensively multiple times weekly alongside regular stimulant use may benefit enormously from the life saving potential of OAT. Approximately a week after being interviewed for this study, 20-year-old Laura died from an overdose. She had been using meth multiple times daily but also binged on heroin/fentanyl with her boyfriend at least twice a week. Over the course of two interviews, she consistently insisted that her opioid use was not a part of her “addiction” – although, at one point in an interview, she did wonder whether her intensive meth use “masked” the kinds of serious withdrawal symptoms that she associated with an opioid addiction. Alarming, Laura had never had a discussion with a provider about OAT, even while attending a 3-month residential treatment program:

[We didn’t discuss OAT] because I wasn’t really addicted to down [heroin/fentanyl]. There would be no point. But I also didn’t really say anything [about heroin/fentanyl use]. [I felt that] the [treatment] program was mostly for crystal meth. If I was addicted to heroin, I really didn’t know it. I was doing so much crystal meth that I couldn’t feel any withdrawal from heroin. (White Woman)

It’s been some kind of miracle: Improvising medicine amidst a public health crisis

A small number of youth described what they viewed as successful encounters with the treatment system. These youth highlighted instances of working together with providers to “find the right treatment” or “solutions” to the health and social problems they were facing. Some youth appreciated it when providers focused on the longstanding mental and physical health issues that youth understood as preceding their problematic drug use, rather than zeroing in on drug use as the primary problem. Other youth appreciated more direct help with addressing the negative health and social consequences of drug use that they had come

to define as unmanageable. Jake reflected:

I've had more success lately, more so than I have in the past. I've cut my drug use way down. Before I was using, you know, as much as the money I could get my hands on, but now I actually save money, I spend it on things that I want. I've tried Suboxone, I've tried methadone – didn't have much success with either of them. And then a doctor [at the rapid access addiction clinic at Vancouver's inner city hospital] put me on Kadian [slow release oral] morphine, and that's made a huge difference. With Kadian I'm having way less side effects, way less withdrawal. It's been some kind of a miracle.

Participants who went on OAT for more extended periods of time (>1 month) had the most success with adherence when they were actively involved in decision making around what kind of OAT would work best for them, and for how long. Buprenorphine was generally the least desirable form of OAT among the youth we interviewed, whether because it was understood to “completely block” a valued sense of euphoria that was still possible with methadone, or because of the precipitated withdrawal that may occur during treatment initiation. From the perspective of youth and provider participants, and supported by the first author's clinical experience, after a young person experiences an episode of painful precipitated withdrawal in an ultimately unsuccessful attempt to go and stay on buprenorphine, they are then much less likely to pursue buprenorphine as a treatment option in the future. Indeed, even youth we interviewed who had not experienced precipitated withdrawal themselves were deterred from initiating buprenorphine because of what they had heard regarding others' negative experiences.

Shorter term treatment options were more desirable than the idea of longer term pharmacotherapies among the vast majority of youth participants. For youth who indicated that they were willing to consider OAT, they emphasized the need to discuss tapering protocols with providers at the outset, as well as which kind of OAT would be the easiest to “come off of.” One physician echoed the importance of discussing timelines with youth when introducing the idea of OAT, particularly if the latter had been using opioids for a relatively short period of time prior to seeking treatment. She explained:

[When talking about OAT] with youth, I kind of feel like you need to say, ‘Give me a month. Give me three months. Just try this to see how your life falls into place in the next few months, and then you can decide about whether you take away these tools [i.e., different forms of OAT].’ That's kind of how I frame it. ‘This is one of the tools we have to treat your opiate use disorder. Without it, we know you're at a higher risk of dying. So, why don't we try this tool, and then once you get some other things in place [e.g., more stable social relationships, housing, income generation, school engagement], maybe you'll consider a treatment program. Then maybe we can scale back. Either we lower your dose, or taper off.’

Consistent with the findings of DF's long term research with youth in Greater Vancouver, our conversations with youth revealed that in the absence of developing collaborative, trusting relationships with providers across time and place, many youth preferred to address problematic opioid use “on their own,” usually through the use of other substances such as cannabis and meth (see also [Fast, Kerr, Wood, & Small, 2014](#)). For example, Laura initially began using meth as a means to reduce – but never completely eliminate – her heroin/fentanyl use:

I was kind of doing down [heroin/fentanyl] more at the time [when I first moved into government subsidized youth housing]. I ended up buying crystal meth to get off of it. There was the common thing where it's like, okay, if you do crystal meth you do heroin/[fentanyl] to get off the crystal meth. If you're trying to get off heroin/[fentanyl], do crystal meth. Like, that's what people tend to do.

Discussion

Our findings underscore youth's hopes and fears surrounding making a “full” recovery from past drug use, and highlight that longer term adherence to OAT was often incompatible with youth's imaginings of both the near and distant future. Youth who did initiate OAT often did so to mediate painful withdrawal symptoms, as well as pressing physical and mental health issues. While youth who accessed OAT to mediate withdrawal were willing to consider buprenorphine, youth who accessed OAT to mediate physical and mental health issues expressed a clear preference for methadone because of its euphoric effects. A number of polysubstance using youth who were primarily using stimulants but binged on opioids several times a week simply did not access OAT, despite its lifesaving potential. While the majority of youth participants who accessed OAT tended to rapidly cycle on and off buprenorphine and methadone, participants who accessed OAT for longer periods of time (>1 month) had improved adherence when they were actively involved in decision making around what kind of OAT would work best for them, and for how long.

In addiction medicine, recognition of SUD as a “chronic and relapsing” disease continues to inform a shift from care models focused on the management of acute episodes – i.e., “treat and discharge” approaches – to those that emphasize a continuum of care (ranging from harm reduction to abstinence focused services) and the long term management of drug use through pharmacological and psychosocial treatment modalities ([Garcia, 2010](#); [Meyers, 2013](#)). While the “disease” or “chronicity” model of addiction can shift blame away from people who use drugs and be de-stigmatizing, our results support a small body of previous research which demonstrates that models of addiction which establish an expectation of relapse can also create a sense of inevitable demise and “unendingness” among those seeking treatment, and can actually undermine treatment success ([Garcia, 2010](#); [Gonzales, Anglin, Beattie, Ong, & Glik, 2012](#)). As [Gonzales et al. \(2012\)](#) argue, chronicity/illness rhetoric may be particularly problematic for youth. Drawing on a qualitative study with over 100 adolescents currently in treatment throughout diverse areas of Los Angeles county, they demonstrate that illness/chronicity rhetoric may not resonate among youth because “substance use problems are considered [among youth to be] more of a behavioral lifestyle (individual choice) rather than a lifelong chronic illness (i.e., they do not view it as serious; they feel they can stop at anytime without relapse concern; and they do not think they are at risk for negative outcomes)” ([Gonzales et al., 2012](#), p. 147). Our findings support the conclusion drawn by this study, but also differ in important ways. Particularly in the context of the current crisis, youth participants were generally well aware of the cumulative risks of their drug use; even younger youth had experienced numerous negative health and social consequences as a result of their drug use, including multiple overdoses. And yet, similar to the participants in the other study, they continued to be highly optimistic about their ability to recover quickly from OUD and pursue “normal kinds of futures,” either with or without the short term use of OAT. When providers unintentionally undermined youth's sense of optimism, including by reinforcing the notion of SUD as a chronic condition or disease that would need to be managed across the lifecourse with OAT, the results could be disastrous. Providers need to be aware of how, particularly among youth populations, illness/chronicity rhetoric may not be acceptable or effective in opening up productive conversations with youth about their substance use or OAT. In general, providers need to pay close attention to youth's ideas about recovery – in the case of this study population, the idea that recovery is something that happens relatively quickly and equals complete abstinence from substance use, including pharmacotherapies. Underscoring the context of the current crisis, there may be an opportunity to talk to youth about whether recovery in this instance could initially include harm reduction oriented interventions (e.g., the use of safer consumption sites if a relapse does occur) and OAT (to lower the likelihood of relapse and overdose).

Our findings support previous work demonstrating the challenges of treating youth, and in particular vulnerable, street entrenched youth, with OAT (Yang et al., 2011). These challenges are perhaps even more pronounced among polysubstance using youth who primarily use stimulants but binge on opioids several times a week. A previous study with Indigenous youth from across British Columbia found that frequent alcohol use was negatively associated with initiating methadone (Yang et al., 2011). The authors hypothesize that the preferential treatment of alcohol withdrawal in acute settings, patient choice, and difficulties connecting with medical care all contributed to lowered uptake of methadone. In our setting, youth generally have reasonably good access to well trained providers and a continuum of substance use care across acute, community and residential settings. However, consistent with the findings of the aforementioned study, polysubstance using youth who primarily identified as stimulant (usually meth) users were less likely to have spoken with a provider about the potential benefits of OAT. The death of one participant during the course of this study powerfully underscores that providers need to open up conversations with all youth regarding the full scope of their drug use, and whether OAT could be “one tool” (as one provider participant put it) in their treatment plan.

Our findings also highlight the need to open up conversations with youth about their mental and physical health challenges, without necessarily explicitly connecting these to substance use. Many of the youth who participated in this study indicated that they initiated substance use to mediate longstanding mental and physical health issues. Interestingly, a number of youth indicated that they initially sought out OAT, and in particular methadone, for the same reason. While both of these strategies may work well for some youth in the short term, results from our previous research and this study indicate that this kind of “self medication” – whether with illicit substances or OAT – can ultimately exacerbate the harms experienced by youth (Fast et al., 2014; McCarthy, Tomlinson, Anderson, Marlatt, & Brown, 2005). When talking to youth about their drug use and possible treatment plans, providers need to understand what strategies youth are currently employing to manage their substance use – as well as any physical and mental health issues – and involve youth in decision making about whether OAT might fit with these existing strategies or represent a new strategy worth trying. There is emerging evidence that buprenorphine can play a role in mood regulation via anti-depressive effects (Karp et al., 2014; Streck, Ochalek, Badger, & Sigmon, 2018). While further research is needed to explore the effects of OAT on youth’s mental health, it is worth discussing – as one provider participant described – the potential mental health benefits of buprenorphine with youth when opening up a conversation about OAT.

When discussing OAT with youth, providers should openly discuss the unique pharmacokinetics of each therapy and different modes of initiation, and work collaboratively with youth on a treatment plan that addresses their hopes and fears surrounding precipitated withdrawal, the duration and demands of adhering to pharmacotherapies (e.g., regular urine screens and pharmacy trips), and their imaginings of the near and distant future. In the first author’s clinical experience, novel ways of initiating buprenorphine such as “microdosing” (i.e., giving small, repetitive doses of buprenorphine to allow the pharmacotherapy to accumulate at the receptor) decrease the risk of precipitated withdrawal, and are often attractive to youth for this reason (BC Pharmacy Association, 2018; Hammig, Kemter, Strasser, von Bardeleben, & Guggenberger, 2016).

Youth who participated in this study described skillfully navigating interactions with providers to initiate and optimize their dosages of OAT. This was not dissimilar to how youth used illicit substances – for example, they described using opioids to mediate withdrawal from stimulants (and vice versa), as well as mental and physical health issues (see also Fast et al., 2014). As Todd Meyers (2013) demonstrates in his ethnography of youth moving in and out of a residential treatment centre in Baltimore, youth employed their own calculations and logics when attempting to treat drug use that had become problematic.

Sometimes, they included providers in their plans; other times, they attempted to treat themselves independently. These calculations and logics could diverge dramatically from those employed by providers – as, for example, when youth taper themselves off buprenorphine after just a few days of treatment. But, as Meyers also shows, youth’s calculations and logics could be informed by those they encountered in treatment settings, or simply heard about from peers. In many cases, there may be an opportunity for providers to work with youth on making a treatment plan that incorporates multiple ways of seeing the problem of substance use and framing its solutions. The danger of not doing so is increasing numbers of youth disengaging from the healthcare system out of the belief that it “doesn’t work” for “people like them,” who are better off handling their problematic substance use “on their own” (Fast, Kerr, Wood, & Small, 2014). Barriers to adherence such as frequent urine screens and daily trips to the pharmacy for witnessed dosing of OAT should also be critically evaluated, particularly given the current crisis.

In sum, the results of this study point to both the challenges and opportunities of connecting vulnerable youth with OAT in our and other similar settings. Ultimately, OAT is only one piece of what is needed to address the overdose crisis locally and across North America. Even promising initiatives such as injectable opioid agonist therapy (iOAT; titrated daily witnessed injected doses of diacetylmorphine or hydromorphone) may not be attractive to these individuals because of the need to visit a clinic several times per day to receive doses (Oviedo-Joekes et al., 2009, 2016). For some youth, “safe supply” initiatives such as the new tablet program operating out of Vancouver’s Downtown Eastside (through which individuals with severe OUD can access hydromorphone tablets on an as needed basis for witnessed ingestion; Vancouver Courier, 2018) may be beneficial. However, our findings caution against talking to youth about any of these programs by drawing on an “addiction as chronic illness” rhetoric. Rather, it may be more effective to open up conversations with youth by trying to understand their own logics and calculations when it comes to both their substance use and methods for reducing or eliminating that use. Indeed, many providers in our setting are already doing this with some success. While treating youth engaged in polysubstance use and those experiencing co-occurring substance use and mental health issues presents unique challenges, our conversations with youth and providers illustrate that there are opportunities to talk to youth about substance use, mental health and OAT in ways that acknowledge these complex lived experiences. In the context of the current crisis, taking a more improvisational approach to providing care to youth means opening up new and perhaps unexpected conversations with youth about substance use, mental health, OAT, and harm reduction, and working collaboratively with them to define common short term goals and long term visions of recovery.

Declaration of competing interest

The authors have no conflicts of interest to declare.

CRediT authorship contribution statement

Valerie Giang: Conceptualization, Formal analysis, Writing - original draft. **Madison Thulien:** Data curation, Formal analysis, Writing - review & editing, Project administration. **Ryan McNeil:** Funding acquisition, Writing - review & editing. **Kali Sedgemore:** Writing - review & editing. **Haleigh Anderson:** Writing - review & editing. **Danya Fast:** Funding acquisition, Conceptualization, Data curation, Formal analysis, Writing - original draft.

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References

- Amass, L., Ling, W., Thomas, E., Freese, C., Jeffrey, J., et al. (2004). Bringing buprenorphine-naloxone detoxification to community treatment providers: The NIDA clinical trials network field experience. *American Journal on Addictions*, *13*, S42–S66. <https://doi.org/10.1080/1055049049044080710.1001/archgenpsychiatry.2011.121>.
- Amato, L., Davoli, M., Minozzi, S., Ferroni, E., Ali, R., et al. (2013). Methadone at tapered doses for the management of opioid withdrawal. *Cochrane Database of Systematic Reviews*, *2*. <https://doi.org/10.1002/14651858.cd003409.pub4>.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Arlington, VA: American Psychiatric Publishing.
- Armstrong, T. D., & Costello, E. J. (2002). Community studies on adolescent substance use, abuse, or dependence and psychiatric comorbidity. *Journal of Consulting and Clinical Psychology*, *70*, 1224–1239. <https://doi.org/10.1037/0022-006X.70.6.1224>.
- Ball, J., & Ross, A. (1991). *The effectiveness of methadone maintenance treatment: Patients, programs, services and outcomes*. New York: Springer-Verlag.
- Barker, B., Kerr, T., Nguyen, P., Wood, E., & DeBeck, K. (2015). Barriers to health and social services for street-involved youth in a Canadian setting. *Journal of Public Health Policy*, *36*, 350–363. <https://doi.org/10.1057/jphp.2015.8>.
- BC Centre on Substance Use and Bc Ministry of Health. (2017). A guideline for the clinical management of opioid use disorder. <http://www.bccsu.ca/care-guidance-publications> (accessed 20 Nov 2018).
- BC Coroners Service. (2020). Illicit drug toxicity deaths in BC: January 1, 2009 – March 31, 2020. <https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/statistical/illicit-drug.pdf> (accessed 22 May 2020).
- BC Pharmacy Association. (2018). Microdosing for buprenorphine for induction (the BERNESSE method). <https://www.bcpharmacy.ca/news/microdosing-buprenorphine-induction-bernese-method> (accessed 19 Feb 2019).
- Bell, J. R., Butler, B., Lawrance, A., Batey, R., & Salmelainen, P. (2009). Comparing overdose mortality associated with methadone and buprenorphine treatment. *Drug and Alcohol Dependence*, *104*, 73–77. <https://doi.org/10.1016/j.drugalcdep.2009.03.020>.
- Boivin, J. F., Roy, E., Haley, N., & Galbaud, F. G. (2005). The health of street youth: A Canadian perspective. *Canadian Journal of Public Health*, *96*, 432–437. <https://www.jstor.org.ezproxy.library.ubc.ca/stable/41996049>.
- Borodovsky, J. T., Levy, S., Fishman, M., & Marsch, L. A. (2018). Buprenorphine treatment for adolescents and young adults with opioid use disorders: A narrative review. *Journal of Addiction Medicine*, *12*, 170–183. <https://doi.org/10.1097/ADM.0000000000000388>.
- Boyd, J., Fast, D., Hobbins, M., McNeil, R., & Small, W. (2017). Social-structural factors influencing periods of injection cessation among marginalized youth who inject drugs in Vancouver, Canada: An ethno-epidemiological study. *Harm Reduction Journal*, *14*, 31. <https://doi.org/10.1186/s12954-017-0159-9>.
- Bukstein, O. G., & Horner, M. S. (2010). Management of the adolescent with substance use disorders and comorbid psychopathology. *Child and Adolescent Psychiatric Clinics of North America*, *19*, 609–623. <https://doi.org/10.1016/j.chc.2010.03.011>.
- Canadian Institute for Health Information and Canadian Centre on Substance Abuse. (2016). *Hospitalizations and emergency department visits due to opioid poisoning in Canada*. Ottawa, ON: CIHI. https://secure.cihi.ca/free_products/Opioid%20Poisoning%20Report%20%20EN.pdf (accessed 20 Nov 2018).
- Dole, V. P., & Nyswander, M. (1965). A medical treatment for diacetylmorphine (heroin) addiction: A clinical trial with methadone hydrochloride. *Journal of the American Medical Association*, *193*, 646–650. <https://doi.org/10.1001/jama.1965.03090080008002>.
- Fairbairn, N., Kerr, T., Buxton, J. A., Li, K., Montaner, J. S., et al. (2007). Increasing use and associated harms of crystal methamphetamine injection in a Canadian setting. *Drug and Alcohol Dependence*, *88*, 313–316. <https://doi.org/10.1016/j.drugalcdep.2006.10.019>.
- Fast, D., Kerr, T., Wood, E., & Small, W. (2014). The multiple truths about crystal meth among young people entrenched in an urban drug scene: A longitudinal ethnographic investigation. *Social Science & Medicine*, *110*, 41–48. <https://doi.org/10.1016/j.socscimed.2014.03.029>.
- Feder, K. A., Krawczyk, N., & Saloner, B. (2017). Medication-assisted treatment for adolescents in specialty treatment for opioid use disorder. *Journal of Adolescent Health*, *60*, 747–750. <https://doi.org/10.1016/j.jadohealth.2016.12.023>.
- Fischer, B., Murphy, Y., Rudzinski, K., & MacPherson, D. (2016). Illicit drug use and harms, and related interventions and policy in Canada: A narrative review of select key indicators and developments since 2000. *International Journal of Drug Policy*, *27*, 23–35. <https://doi.org/10.1016/j.drugpo.2015.08.007>.
- Fudala, P. J., Bridge, P., Herbert, S., Williford, W., Chiang, N., et al. (2003). Office-based treatment of opiate addiction with a sublingual-tablet formulation of buprenorphine and naloxone. *New England Journal of Medicine*, *349*, 949–958. <https://doi.org/10.1056/NEJMoa022164>.
- Garcia, A. (2010). *The pastoral clinic: Addiction and dispossession along the Rio Grande*. Berkeley: University of California Press.
- Gonzales, R., Anglin, M. D., Beattie, R., Ong, C. A., & Glik, D. C. (2012). Perceptions of chronicity and recovery among youth in treatment for substance use problems. *Journal of Adolescent Health*, *51*, 144–149. <https://doi.org/10.1016/j.jadohealth.2011.11.010>.
- Government of Canada. (2018). Action on opioids: 2016 and 2017. <https://www.canada.ca/en/health-canada/services/publications/healthy-living/actions-opioids-2016-2017.html> (accessed 12 Feb 2019).
- Greenfield, B. L., Owens, M. D., & Ley, D. (2014). Opioid use in Albuquerque, New Mexico: A needs assessment of recent changes and treatment availability. *Addiction Science & Clinical Practice*, *9*, 10. <https://doi.org/10.1186/1940-0640-9-10>.
- Guarino, H. M., Marsch, L. A., Campbell, W. S., Gargano, S. P., Haller, D. L., et al. (2009). Methadone maintenance treatment for youth: Experiences of clients, staff, and parents. *Substance Use & Misuse*, *44*, 1979–1989. <https://doi.org/10.3109/10826080802494800>.
- Hadland, S. E., DeBeck, K., Kerr, T., Feng, C., Montaner, J. S., et al. (2014). Prescription opioid injection and risk of hepatitis C in relation to traditional drugs of misuse in a prospective cohort of street youth. *BMJ Open*, *4*, Article e005419. <https://doi.org/10.1136/bmjopen-2014-005419>.
- Hadland, S. E., Park, T. W., & Bagley, S. M. (2018). Stigma associated with medication treatment for young adults with opioid use disorder: A case series. *Addiction Science & Clinical Practice*, *13*, 15. <https://doi.org/10.1186/s13722-018-0116-2>.
- Hadland, S. E., Wood, E., & Levy, S. (2016). How the paediatric workforce can address the opioid crisis. *Lancet*, *388*, 1260–1261. [https://doi.org/10.1016/S0140-6736\(16\)31573-2](https://doi.org/10.1016/S0140-6736(16)31573-2).
- Hammig, R., Kemter, A., Strasser, J., von Bardeleben, U., Gugger, E., et al. (2016). Use of microdoses for induction of buprenorphine treatment with overlapping full opioid agonist use: The Bernese method. *Substance Abuse and Rehabilitation*, *7*, 99–105. <https://doi.org/10.2147/SAR.S109919>.
- Johnson, R. E., Chutuave, M. A., Strain, E. C., Walsh, S. L., Stitzer, M. L., et al. (2000). A comparison of levomethadyl acetate, buprenorphine, and methadone for opioid dependence. *New England Journal of Medicine*, *343*, 1290–1297. <https://doi.org/10.1056/NEJM200011023431802>.
- Kakko, J., Svanborg, K. D., Kreek, M. J., & Hellig, M. (2003). 1-year retention and social function after buprenorphine-assisted relapse prevention treatment for heroin dependence in Sweden: A randomised, placebo-controlled trial. *Lancet*, *361*, 662–668. [https://doi.org/10.1016/S0140-6736\(03\)12600-1](https://doi.org/10.1016/S0140-6736(03)12600-1).
- Karp, J. F., Butters, M. A., Begley, A. E., Miller, M. D., Lenze, E. J., et al. (2014). Safety, tolerability, and clinical effect of low-dose buprenorphine for treatment-resistant depression in midlife and older adults. *Journal of Clinical Psychiatry*, *75*, 785–793. <https://doi.org/10.4088/JCP.13m08725>.
- Kerr, T., Marshall, B. D., Miller, C., Shannon, K., Zhang, R., Montaner, J. S., et al. (2009). Injection drug use among street-involved youth in a Canadian setting. *BMC Public Health*, *3*, 171. <https://doi.org/10.1186/1471-2458-9-171>.
- Litz, M., & Leslie, D. (2017). The impact of mental health comorbidities on adherence to buprenorphine: A claims based analysis. *American Journal on Addictions*, *26*, 859–863. <https://doi.org/10.1111/ajad.12644>.
- Lyons, R. M., Yule, A. M., Schiff, D., Bagley, S. M., & Wilens, T. E. (2019). Risk factors for drug overdose in young people: A systematic review of the literature. *Journal of Child and Adolescent Psychopharmacology*, *29*. <https://doi.org/10.1089/cap.2019.0013>. No. 7 Original Articles.
- Marsch, L. A., Bickel, W. K., Badger, G. J., Stothart, M. E., Quesnel, K. J., et al. (2005). Comparison of pharmacological treatments for opioid-dependent adolescents: A randomized controlled trial. *Archives of General Psychiatry*, *62*, 1157–1164. <https://doi.org/10.1001/archpsyc.62.10.1157>.
- Matson, S. C., Hobson, G., Abdel-Rasoul, M., & Bonny, A. E. (2014). A retrospective study of retention of opioid-dependent adolescents and young adults in an outpatient buprenorphine/naloxone clinic. *Journal of Addiction Medicine*, *8*, 176–182. <https://doi.org/10.1097/ADM.0000000000000035>.
- McCarthy, D. M., Tomlinson, K. L., Anderson, K. G., Marlatt, G. A., & Brown, S. A. (2005). Relapse in alcohol- and drug-disordered adolescents with comorbid psychopathology: Changes in psychiatric symptoms. *Psychology of Addictive Behaviors*, *19*, 28–34. <https://doi.org/10.1037/0893-164X.19.1.28>.
- Metzger, D. S., Woody, G. E., McLellan, A. T., O'Brien, C. P., Druley, P., et al. (1993). Human immunodeficiency virus seroconversion among intravenous drug users in and out-of-treatment: An 18-month prospective follow-up. *Journal of Acquired Immune Deficiency Syndromes*, *6*, 1049–1056.
- Meyers, T. (2013). *The clinic and elsewhere: Addiction, adolescents, and the afterlife of therapy*. Seattle: University of Washington Press.
- Minozzi, S., Amato, L., Bellisario, C., & Davoli, M. (2014). Maintenance treatments for opiate-dependent adolescents. *Cochrane Database of Systematic Reviews*, *6*, CD007210. <https://doi.org/10.1002/14651858.CD007210.pub3>.
- Mitra, G., Wood, E., Nguyen, P., Kerr, T., & DeBeck, K. (2015). Drug use patterns predict risk of non-fatal overdose among street-involved youth in a Canadian setting. *Drug and Alcohol Dependence*, *153*, 135–139. <https://doi.org/10.1016/j.drugalcdep.2015.05.035>.
- Myers, M. G., Brown, S. A., & Mott, M. A. (1995). Preadolescent conduct disorder behaviors predict relapse and progression of addiction for adolescent alcohol and drug abusers. *Alcoholism: Clinical and Experimental Research*, *19*, 1528–1536. <https://doi.org/10.1111/j.1530-0277.1995.tb01019.x>.
- National Institute on Drug Abuse. (2020). *Overdose death rates*. United States of America: National Institutes of Health. <https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates> (accessed 22 May 2020).

- Ochoa, K. C., Hahn, J. A., Seal, K. H., & Moss, A. R. (2001). Overdosing among young injection drug users in San Francisco. *Addictive Behaviors*, *26*, 453–460. [https://doi.org/10.1016/S0306-4603\(00\)00115-5](https://doi.org/10.1016/S0306-4603(00)00115-5).
- Oviedo-Joekes, E., Brissette, S., Marsh, D. C., Lauzon, P., Guh, D., et al. (2009). Diacetylmorphine versus methadone for the treatment of opioid addiction. *New England Journal of Medicine*, *361*, 777–786. <https://doi.org/10.1056/NEJMoa0810635>.
- Oviedo-Joekes, E., Guh, D., Brissette, S., Marchand, K., MacDonald, S., et al. (2016). Hydromorphone compared with diacetylmorphine for long-term opioid dependence: A randomized clinical trial. *JAMA Psychiatry*, *73*, 447–455. <https://doi.org/10.1001/jamapsychiatry.2016.0109>.
- Phillips, M., DeBeck, K., Desjarlais, T., Morrison, T., & Feng, C. (2014). Inability to access addiction treatment among street-involved youth in a Canadian setting. *Substance Use & Misuse*, *49*, 1233–1240. <https://doi.org/10.3109/10826084.2014.891618>.
- Providence Health Care. (2016a). Training the next generation of leaders in addiction medicine. <http://addictionmedicinefellowship.org/addiction-medicine-fellowship/the-program/> (accessed 21 Feb 2019).
- Providence Health Care. (2016b). St. Paul's addiction consult team. http://medstaff.providencehealthcare.org/news_and_events/latest-news/st-paul-s-addiction-consult-team (accessed 19 Feb 2019).
- Streck, J. M., Ochalek, T. A., Badger, G. J., & Sigmon, S. C. (2018). Interim buprenorphine treatment during delays to comprehensive treatment: Changes in psychiatric symptoms. *Experimental and Clinical Psychopharmacology*, *26*, 403–409. <https://doi.org/10.1037/pha0000199>.
- Tomlinson, K. L., Brown, S. A., & Abrantes, A. (2004). Psychiatric comorbidity and substance use treatment outcomes of adolescents. *Psychology of Addictive Behaviors*, *18*, 160–169. <https://doi.org/10.1037/0893-164X.18.2.160>.
- Uhlmann, S., DeBeck, K., Simon, A., Kerr, T., Montaner, J. S. G., et al. (2014). Health and social harms associated with crystal methamphetamine use among street-involved youth in a Canadian setting. *American Journal on Addictions*, *23*, 393–398. <https://doi.org/10.1111/j.1521-0391.2014.12123.x>.
- Vancouver Coastal Health. Vancouver community's child & youth mental health & substance use strategy. <http://www.vch.ca/your-care/mental-health-substance-use/children-youth-mental-health-services/vancouver-community-s-child-youth-mental-health-and-substance-use-strategy> (accessed 21 Feb 2019).
- Vancouver Courier. (2018). First in Canada drug program to launch in Vancouver's Downtown Eastside. <https://www.vancourier.com/news/first-in-canada-drug-program-to-launch-in-vancouver-s-downtown-eastside-1.23551868> (accessed 2 Dec 2019).
- Vancouver Sun. (2018). Fuelled by the fentanyl crisis, St. Paul's unique rapid-treatment centre sees a five-fold increase in visitors in first year. <https://vancouversun.com/health/local-health/fuelled-by-fentanyl-crisis-st-pauls-unique-rapid-treatment-centre-sees-a-five-fold-increase-in-visitors-in-first-year> (accessed 19 Feb 2019).
- Werb, D., Kerr, T., Li, K., Montaner, J., & Wood, E. (2008). Risks surrounding drug trade involvement among street-involved youth. *The American Journal of Drug and Alcohol Abuse*, *34*, 810–820. <https://doi.org/10.1080/00952990802491589>.
- Wood, E., Stoltz, J. A., Montaner, J. S., & Kerr, T. (2006). Evaluating methamphetamine use and risks of injection initiation among street youth: The ARYS study. *Harm Reduction Journal*, *3*, 18. <https://doi.org/10.1186/1477-7517-3-18>.
- Woody, G. E., Poole, S. A., Subramaniam, G., Dugosh, K., & Bogenschutz, M. (2008). Extended vs short-term buprenorphine-naloxone for treatment of opioid-addicted youth: A randomized trial. *Journal of the American Medical Association*, *300*, 2003–2011. <https://doi.org/10.1001/jama.2008.574>.
- Wu, L. T., Zhu, H., & Swartz, M. S. (2016). Treatment utilization among persons with opioid use disorder in the United States. *Drug and Alcohol Dependence*, *169*, 117–127. <https://doi.org/10.1016/j.drugalcdep.2016.10.015>.
- Yang, J., Oviedo-Joekes, E., Christian, K. W., Li, K., Louie, M., et al. (2011). The Cedar Project: Methadone maintenance treatment among young Aboriginal people who use opioids in two Canadian cities. *Drug and Alcohol Review*, *30*, 645–651. <https://doi.org/10.1111/j.1465-3362.2010.00258.x>.
- Zanis, D. A., & Woody, G. E. (1998). One-year mortality rates following methadone treatment discharge. *Drug and Alcohol Dependence*, *52*, 257–260. [https://doi.org/10.1016/S0376-8716\(98\)00097-0](https://doi.org/10.1016/S0376-8716(98)00097-0).