



Narcan and Narcan't: Implementation factors influencing police officer use of Narcan

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ABSTRACT

First responders—including police officers—play a prominent role in managing the risk of fentanyl overdoses. In many jurisdictions, they have Narcan (also commercially available as Narcan) at their disposal to counter the effects of an opioid overdose. Little empirical research exists on how effectively police are incorporating this emergency rescue medication into routine practice. Between 2018 and 2019, we conducted semi-structured interviews with police officers from two Western Canadian police organizations. We also administered organization-wide web surveys to determine what factors facilitate or inhibit the incorporation of Narcan into police practice by looking at two domains: 1) the inner setting of the police organization and 2) personal knowledge of, and attitudes toward, an intervention. Whether officers administered Narcan depended on several personal and organizational factors, including: 1) having sufficient knowledge and concern about the fentanyl situation, 2) being knowledgeable about Narcan and trained in its use, 3) the medication being readily available to officers, and 4) being willing to administer it to citizens.

1. Introduction

North America is experiencing an opioid-related public health crisis. The availability of fentanyl and its analogues such as carfentanyl and furanyl fentanyl (all referred to as fentanyl below) as recreational drugs have been key contributors to escalating levels of opioid addiction and fatalities (Ciccarone, 2017). These synthetic opioids are exceptionally potent, with fentanyl and carfentanyl being 100 and 10,000 times more potent than morphine, respectively (PubChem, n.d.).

Fentanyl is often mixed (buffered) with other substances (e.g., baby powder or powdered sugar) or combined with other street drugs as an inexpensive way to enhance a user's high (Almani et al., 2015). In Canada, fentanyl has exacerbated the opioid crisis, with twice as many Canadians dying from opioids than traffic fatalities in 2017 (Transport Canada, 2017). In 2018, 4588 Canadians died from opioid overdoses, an average of one life lost every 2 hours (Government of Canada, 2019).

First responders—including police, firefighters, and emergency medical technicians—play a prominent role in managing overdose risks (Wermeling, 2013; Davis et al., 2014). One of the most useful resources at their disposal in many jurisdictions is Naloxone. An antagonist, Naloxone quickly and safely blocks the effects of opioids, reversing

respiratory depression and restoring normal breathing. Although Naloxone can be administered intravenously, it is also commercially available as Narcan, an easy-to-administer nasal spray dispenser approximately half the size of a baseball. In the United States, professional and regulatory bodies have encouraged officers to carry and administer this medication. The Office of National Drug Control Policy (2013: 1), for example, advised that Naloxone belongs “in the patrol cars of every law enforcement professional across the nation.” The American College of Medical Toxicologists recommended that emergency responders who “... may encounter fentanyl or fentanyl analogues should be trained to recognize the signs and symptoms of opioid intoxication, have Naloxone readily available, and be trained to administer Naloxone and provide active medical assistance” (Moss et al., 2018: 1).

Unfortunately, published research on how Canadian police services are adopting Naloxone-related policies and practices is non-existent. American literature on the topic suggests that police services in most jurisdictions in the United States are heeding the call (Beletsky, 2014; Ballard and Vinson, 2018). As of March 2018, over 2300 law enforcement agencies across the majority of American states (88%) reported having some version of a Naloxone rescue/reversal program to help curb opioid-related deaths (Lurigio et al., 2018). Early research has found

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that officers equipped with Naloxone have been receptive to training to identify and intervene in opioid-related overdoses (Davis et al., 2015; Fisher et al., 2016). Research demonstrates that this training increases officer knowledge of, and confidence in, managing overdose episodes (Ray et al., 2015). It also allows for more accurate assessments of overdose symptoms and techniques for administering the medication without producing significant adverse effects on recipients (Fisher et al., 2016). Based on available evidence from the United States, when police officers carry Narcan, overdose fatalities appear to decrease (Rando et al., 2015; Fisher et al., 2016) while officer job satisfaction increases (Lurigio et al., 2018).

While these early findings are promising, it is still unclear how effective police officers and organizations have been in incorporating this medication into routine practice—be it in the United States or Canada. We address this gap in knowledge by adopting an “implementation science” research strategy designed to identify factors that might be facilitating or impeding officers’ use of Narcan. Attending to the organizational context in which Narcan is to be administered by police officers is vital, as “[w]ithout a thorough understanding of the context, an [evidence-based practice] may either not be adopted or may be taken up in an adapted form with compromised fidelity due to contextual pressures” (Bauer et al., 2015: 5).

We seek to identify key factors derived from different domains that appear to be limiting Narcan’s uptake in policing. The concluding discussion refers back to the Consolidated Framework for Implementation Research, described below, and points to several strategies that could help address some of the implementation difficulties that officers identify.

2. Theoretical framework

Implementation science emerged from a recognition that there is often a disjuncture between the clinical effectiveness of treatments or harm reduction measures and how such measures are applied in practice (Rubenstein and Pugh, 2006; Proctor et al., 2011). Implementation science aims to address this gap, and entails the “study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services” (Eccles and Mittman, 2006: 1). Research in this tradition employs a wide range of methodological approaches, with qualitative methods being identified as crucial—as they can pinpoint local nuances in the implementation context that can be overlooked when using more standardized research instruments (Campbell et al., 2007; Herald et al., 2008). No matter the approach, these studies strive to provide knowledge useful for maximizing positive outcomes by identifying implementation factors limiting the effectiveness of an intervention (and solutions) (Olswang and Prelock, 2015).

One challenge, however, is that implementation science researchers study dramatically different interventions and often use non-standard terminology, resulting in a research literature that has been characterized as a “Tower of Babel” (McKibbin et al., 2010). Consequently, several synthesizing models or frameworks have been introduced to develop a shared vocabulary and help identify commonalities across diverse implementation initiatives. All of these models focus on identifying contextual factors that limit or facilitate implementation. These models are helpful for our purposes, as they allow us to think of the implementation process as involving three main factors: 1) stages, 2) domains, and; 3) strategies. Being attentive to such aspects helps guide research and can point to ways to improve interventions.

Fixsen et al. (2009: 533) have identified six stages in any implementation process: 1) exploration, 2) installation, 3) initial implementation, 4) full implementation, 5) innovation, and 6) sustainability. Being conscious of these stages allows practitioners to identify where an initiative sits on the continuum, the types of implementation challenges characteristic of each stage, and how they might take the next steps

towards producing an effective and sustainable initiative.

In terms of the actual implementation process, the Consolidated Framework for Implementation Research (Damschroder and Hagedorn, 2011) identifies 39 different constructs that can serve as moderators or mediators of implementation outcomes. These constructs operate within five general domains: 1) intervention characteristics, which might include complexity and cost; 2) outer settings, which refers to features such as patient needs, incentives, and external policies; 3) inner settings, including things like organizational culture, the resources available, and readiness for implementation; 4) characteristics of individuals involved in the implementation process, including their knowledge and beliefs about the intervention, and more personal characteristics; and 5) implementation process strategies or tactics that might influence implementation, which can include planning and the role of change agents. In related work, Powell et al. (2012) conducted a narrative review of the implementation science literature. They identified a larger group of 68 implementation strategies, which they subsume under six headings: planning, educating, restructuring, financing, managing quality, and attending to the policy context. During the study period, the two police services we worked with were in the fourth stage of the implementation process (i.e., the “full implementation” stage). Two domains played prominent roles in determining the effectiveness of Narcan implementation—the inner setting of the police organization and the characteristics of individuals, particularly officers’ knowledge of and attitudes towards Narcan.

A recent issue of the journal *Substance Abuse* (2018, vol 39 (2)) focused on “Implementation and Quality Improvement” in relation to opioid use disorder and treatment, provides a sense of the range and variety of implementation science approaches in this field. Research by Jacobson et al. (2018), for example, studied different methods for delivering information relating to Naloxone treatment in a pharmacy training program. Similarly, Jakubowski et al. (2018) focused on education in their study of the 911 Good Samaritan Law, which is designed to encourage citizens to call 911 in the event of an overdose by protecting the caller and overdose victim from prosecution for drug possession. They found that repeated education increased participants’ understanding, suggesting that public information campaigns provide effective public education about this law. Finally, Englander and colleagues (Englander et al., 2018) studied a residential treatment program that incorporated antibiotics to treat patients who also had severe infections, focusing their analysis on a range of organizational challenges that limited the feasibility and acceptability of this program.

3. Context

We conducted our research in Alberta, the second most westerly province in Canada. Alberta has 4.3 million inhabitants spread over its 661,848 km² (255,541 sq. mi). The highest concentration of residents is in Calgary, with a population of 1.3 million in 2019. Approximately 300 km (185 miles) north of Calgary is the provincial capital of Edmonton, which is also the province’s second-largest city (972,000 residents in 2019). These cities are policed by the Calgary Police Service (CPS) and Edmonton Police Service (EPS).

Canada’s opioid crisis has been acute in Alberta, which saw 668 fentanyl-related fatalities in 2018, up from only 6 in 2011. Alberta’s overall fentanyl-related mortality rate for 2018 was 15.4 per 100,000 person-years (Alberta, 2020). Comparing the province’s two largest cities reveals that the overdose situation was more pronounced in Calgary in 2018, where 289 accidental fentanyl-related poisoning deaths were reported (rate of 21.7 per 100,000) while Edmonton experienced 179 such deaths (rate of 18.1). Fentanyl-related deaths declined in 2019, in Calgary (195 fatalities, 14.3 per 100,000), Edmonton (153 fatalities, 15.0 per 100,000), and the province as a whole (513 fatalities, 11.7 per 100,000) (Alberta, 2020), but it is too soon to conclude that the crisis is abating.

In 2015, provincial health officials formed a Fentanyl Action

Committee, which included efforts to make Naloxone widely available to the public (Freeman et al., 2017). The Alberta provincial government declared opioids a public health crisis in May 2017, and formed an Opioid Emergency Response Commission. To try and curb the escalating number of fatal overdoses, officials made Narcan available to peace officers in 2016. However, no measurement or assessment strategy was part of this initiative.

Approximately two years after Narcan was made available to officers, we undertook a multi-site research project to learn how police officers in Edmonton and Calgary were incorporating Narcan into their practice. Consequently, the study occurred during the “full implementation” stage (Fixsen et al., 2009: 533) of Narcan introduction—although, in the organizations we studied, the earlier stages were blurred and occurred almost simultaneously. Our study is an instance of what Damschroder and Hagedorn (2011: 195) have characterized as exploratory implementation science research, employing a grounded theory research strategy (Glaser and Strauss, 1967) to learn about factors that officers identified as possibly hindering the effectiveness of this initiative.

4. Research methods

We conducted semi-structured interviews with officers working in both police services and initiated organization-wide web surveys of all members. Research Ethics Boards at the authors’ universities approved our research design and research instruments. All study participants were informed about the study’s purpose, that they could choose not to answer questions, and that their responses would be anonymized. Interview participants signed consent forms, while those who completed the web survey clicked on a button indicating their informed consent.

While our study used quantitative and qualitative research methods, this paper relies primarily on the latter to demonstrate the factors shaping how Narcan is used by police officers. Studying how two different police organizations have implemented Narcan gave our findings a comparative dimension, allowing us to examine how local variations in police culture and organizational routines shape the ways officers conceive of and manage fentanyl-related risks.

For EPS, we presented our study plans and goals to senior management, who subsequently sent e-mails to their respective division commanders asking them to solicit volunteer interview participants. With CPS, we sent a recruitment e-mail through the internal web server. As an inclusion criterion, we looked for officers working in front-line, typically lower-ranked positions. Our EPS interview sample included a cross-section of officers from the six different police divisions in the city. Likewise, our CPS participants typically worked in front-line positions, and included officers from Calgary’s eight different police divisions.

Three of the four authors conducted the semi-structured interviews, which took place over approximately three weeks in each location. These interviews lasted between 38 min and 1 h and 54 min (with the majority lasting about 1 hour). We interviewed 54 EPS officers and 40 CPS officers using a “problem-centered interview” style, focusing on fentanyl and Narcan to ensure consistency between interviews (Witzel and Reiter, 2012). Our interview prompts asked: What sorts of drugs do you regularly deal with? What can your police organization do to increase police officers’ safety when it comes to fentanyl-related risks? Do you carry Narcan? Why or why not? What, if any, training have you received about handling opioids and dealing with overdoses?

We digitally recorded, transcribed verbatim, and analyzed the interviews thematically using a grounded theory approach (Glaser and Strauss, 1967). Four researchers developed a data coding scheme by engaging in “open” and “focused” coding (Emerson et al., 2011), ultimately resulting in 27 main codes. In order to identify emergent themes, two of the authors and three research assistants immediately coded the first six interviews using the two techniques identified above, placing conceptual labels (Strauss and Corbin, 1990, p. 61) on “discreet happenings, events, and other instances of phenomena” that emerged from

the data—comparing and contrasting these events with each other in order to identify more general, higher order, codes or categories (Emerson et al., 2011). After coding the first six interviews, we modified the interview protocols to explore emergent themes in greater detail. We co-coded an additional five interviews after completing all of the interviews, reaching inter-coder reliability of 90%, and then finalized the coding instrument and coded the entire data set. As is common in qualitative studies, we have selected interview quotes that best reflect our findings, with minority views indicated as such. All names are pseudonyms.

About one month after completing the semi-structured interviews we also conducted a web survey in each organization, addressing many of the same issues. The focus and wording of many of the web survey questions were shaped by what members of the research team learned in the qualitative interviews. Communications personnel at both EPS and CPS sent e-mail messages explaining the study to all service members (civilian and sworn). As the topic was not particularly relevant to civilian members, relatively few responded. Hence, in this paper, we analyze responses from sworn members only. EPS members received four e-mail reminders, while CPS members received only one. Consequently, the EPS response rate was higher (41%) than the CPS response rate (30%) (see Table 1).

4.1. Sample characteristics

Constables comprised about two-thirds of the survey sample in each police organization (EPS 67%; CPS 70%). Sergeants and detectives made up about one-quarter (EPS 27%; CPS 23%). The remaining survey participants (6–7%) were in higher ranks. While this respondent profile reflects the composition of both police services, it is also useful for our research since lower- and mid-level police officers have more direct work-related experiences with citizens who use opiates.

In both organizations, almost four out of five members who participated in the survey (78%) were male and 21% were female (1% self-identified as “other”). On average, EPS survey participants were 40 years old, compared to 41 years for CPS members. One-third (34%) of EPS members reported having a university degree, compared to 38% for CPS members. Survey participants had been members of their organizations for an average of thirteen years (EPS 13.1; CPS 12.8). In short, the survey samples for both organizations were quite similar.

For the qualitative component of our study, we interviewed 94 police officers, 54 from EPS and 40 from CPS. Almost all interviewees from both cities worked in front-line positions; only one senior officer working in an oversight position was interviewed in each city. Six of our interviewees in Edmonton were female officers, and in Calgary there were nine.

5. Findings

Our analysis suggests that implementation practices within two key domains identified in the Consolidated Framework for Implementation

Table 1
Survey sample size by organization and rank.

Rank	Edmonton Police Service (EPS)		Calgary Police Service (CPS)	
	Number of members	Final sample n (%)	Number of members	Final sample n (%)
Senior management	109	49 (6%)	122	44 (7%)
Sergeants/detectives	404	205 (27%)	467	144 (23%)
Constables	1390	525 (67%)	1524	439 (70%)
Total	1901	779 (100%)	2113	627 (100%)
Response rate		41%		30%

Research (Damschroder and Hagedorn, 2011) played a prominent role in determining how effectively Narcan was being implemented in policing. These domains consist of the inner setting of the police organization (particularly “work processes”) and the characteristics of individuals (particularly individual knowledge of, and attitudes toward, the intervention).

5.1. Police officers' perceptions of the seriousness of the opioid crisis

A key factor in the success of any public health or harm-reduction initiative is the support of line staff, and the degree to which they view the treatment as “appropriate, fair, and reasonable” (Kazdin, 1981). The study’s survey component was partially aimed at assessing officer support for using Narcan, with officers in both services being generally concerned—and often highly concerned—about opioid use in their jurisdiction. In response to a question asking “How serious a problem is opioid use in the area of the city where you usually work?” 20% of Calgary officers said it was “extremely serious,” 30% answered “serious,” and 35% felt it was “significant” (the other response options were “slight” and “no problem at all”). Edmonton officers were somewhat less concerned about the opioid problem (extremely serious 11%, serious 25%, and significant 44%). City differences were significantly different ($p < 0.05$).

Over half of the CPS officers (53%) reported that they had “personally dealt with an opioid overdose (fatal or not) while on duty in the preceding three months.” This rate is significantly higher than for EPS officers (33%), reflecting the much higher rate of opioid overdoses in Calgary noted earlier. A minority of officers in both police services (CPS 18%; EPS 11%) were “very concerned” about their own “health and safety when on the job, based on their knowledge of and experience with opioid drug use.” Almost two-thirds were “somewhat concerned” (CPS 64%; EPS 63%), with relatively few answering, “I am not concerned at all” (CPS 18%; 26%). Again, city differences were statistically significant.

5.2. Narcan availability and use

Officers generally recognized that opioids pose a health and safety risk in their community and viewed new synthetic opioids like fentanyl as presenting a danger to themselves and fellow officers. One factor contributing to these fears was the pervasive, although incorrect, belief among officers that individuals could overdose on fentanyl through inadvertent airborne or dermal exposure to miniscule amounts of the drug (Rinkunas, 2017).

To address these health-related concerns, each police organization makes Narcan available to officers as an optional piece of equipment. The extent to which officers actually carried Narcan, however, varied

widely (and statistically significantly) across cities (Fig. 1). In response to the question “Do you personally carry Narcan (it blocks effects of opioids) when you are on your regular shift?” almost half of CPS officers (47%) answered “always,” compared to only 8% of EPS officers. Most notably, three-quarters (76%) of EPS officers reported “never” carrying Narcan, compared to only 28% of CPS members.

Within both cities, officers working in higher-crime areas were significantly more likely to report “always” carrying Narcan. In both cities, older officers (and those who had been police officers for a longer time) were significantly less likely to “always” carry Narcan. In Edmonton, male officers were significantly more likely than female officers to “always” carry Narcan, but in Calgary the gender difference was not significant.

Despite between- and within-city differences, those CPS and EPS members who *did* carry Narcan (either “often” or “always”) shared generally similar reasons for doing so. Such commonality was apparent in their responses to the open-ended question, “Why do you often or always carry Narcan?” which we coded into 14 specific and five general categories. Table 2 highlights the general types of answers provided by officers who “always” or “often” carried Narcan. Most commonly, police officers saw Narcan as a *personal* safety product, something they could envision playing a role in protecting themselves or other officers (EPS 43%; CPS 55%).

In an interview, one EPS officer articulated a view shared by many of his colleagues:

Not taking a roadside screening device [breathalyser] out [on a shift ...] is not going to kill my co-worker on the spot. But not having Narcan on the spot? [...] So that's why I place a very high importance on it, because I believe, literally, it can save someone's life. And the majority of members I work with feel likewise as well. Most of them have Narcan on them pretty much all the time. (Floyd)

This theme was echoed by an officer in Calgary:

I can tell you that for the vast majority of our members, the two things [...] they'll sign out are things like a shotgun and Narcan. Those are the two things I sign out over anything else. So, I prioritize taking Narcan out over any other piece of optional equipment. That tells you where I place the value of it. That's more likely to save someone's life than a shotgun, right. (Lex)

Officers who opted to carry Narcan, therefore, did so for comparatively straightforward reasons, tending to see it as something that could benefit themselves, their colleagues, and, to a lesser extent, “high risk” individuals they encountered. The picture is more complicated when it comes to officers who chose *not* to carry Narcan or not administer it to citizens experiencing an overdose. Our interviews demonstrate how this

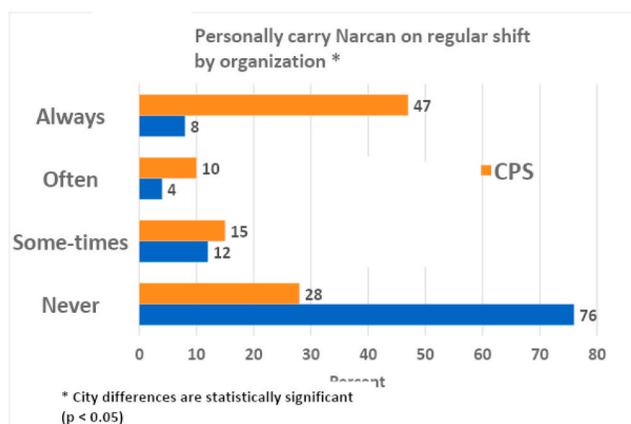


Fig. 1. Personally carry Narcan on regular shift by organization.

Table 2
Reasons for carrying (often or always) Narcan^a.

	% of answers provided ^a	
	EPS	CPS
Protect self and other EPS/CPS members	43	55
Work with high risk groups	29	18
Interact with public	0	11
It's my job	28	10
It saves lives	0	5
Other reasons	0	1
Total	100	100
N (respondents)	90	347
N (answers)	103	454

^a Up to two reasons for often or always carrying Narcan were coded. Ninety EPS members (out of 93 who often or always carried) provided 103 answers, while 347 CPS members (out of 357 who often or always carried) provided 454 answers. Since the number of answers is larger than the number of respondents, and these percentage calculations are based on answers, not respondents), significance tests are not appropriate.

reluctance touched upon implementation factors such as inconvenience, the division of professional responsibilities, confusion about organizational policies, and concerns about legal liability.

5.3. Reluctance to carrying Narcan

As observed in Fig. 1, it was the norm in the EPS to not carry Narcan; 76% of members never carried it, and 12% did so only “sometimes.” In sharp contrast, only 28% of Calgary officers said they “never” carried Narcan while 15% reported doing so “sometimes.” Officers who “never” or “sometimes” carried Narcan were asked, “Why do you never or only sometimes carry Narcan?” Verbatim responses to this open-ended question were coded into 27 specific and four general categories. Table 3 displays the pattern of responses (in general categories) provided by the large majority of EPS officers (76%) and the small minority of CPS officers (28%) who never carried Narcan.

The most common reason EPS and CPS officers provided was that Narcan was not needed to do their particular job. Never-carrying CPS officers (64%) were considerably more likely than never-carrying EPS officers (41%) to provide this explanation, as we would expect, since only a minority of CPS officers never carried, compared to a large majority of EPS officers. Roughly one in ten non-carrying officers (EPS 11%; CPS 6%) noted that someone else (e.g., their partner or supervisor) carried Narcan, so they did not have to.

Somewhat surprisingly, about one-quarter of the answers provided by non-carrying officers in both police services (EPS 28%; CPS 23%) noted that Narcan was not available to them or was difficult to access. Perhaps even more surprising were the “too much hassle” type answers provided by EPS non-carrying officers (18% of all reasons). None of the non-carrying CPS officers provided such responses. Our qualitative interviews offer much needed nuance to these patterns of responses.

5.3.1. Hassle, lack of space, and temperature sensitivity

Part of this “hassle” for EPS officers seemed to involve simply remembering to pick up a Narcan dispenser or having to sign one out at the beginning of their shift. Another prominent variant of this theme was the recurrent complaint that officers did not have space to carry Narcan. These officers believed they were already overburdened with equipment, to the point that adding Narcan was simply not feasible. As Roy, an EPS officer, explained: “We’re already carrying thirty pounds of gear so, you know. Yeah, [Narcan is] only a pound or two, but it adds up quick.” Paul, another EPS officer, articulated the same concerns, noting: “I don’t even carry a baton anymore. [...] There’s just a line where you can only carry so much stuff.”

Other EPS members claimed to not carry Narcan because they had been informed it was ineffective below a specific temperature. Working in Edmonton, where the average low January temperature is -16°C

(3.2°F), several participants suggested there was no sense in carrying Narcan because doing so would inevitably lead to a situation where, “... we’re standing outside in minus thirty [degrees Celsius] trying to administer an ice cube” (Harry, EPS officer). Similarly, another EPS officer, Maurice, stated: “I’ve heard that it’s temperature-sensitive, so I don’t know how effective it would be, regardless if we did carry it.”

Although CPS officers also had to sign out Narcan, carry it on overcrowded utility belts, and administer it in winter temperatures, they almost never identified these as reasons that would preclude them from carrying the medication.

5.3.2. Others carry Narcan

Our quantitative findings (Table 3) suggest that EPS officers (11%) were almost twice as likely as CPS officers (6%) to report “never” carrying Narcan because “someone else carried it”—be it a partner or supervisor. Participants reiterated this point during our qualitative interviews. As EPS officer George told us:

We do have [Naloxone], but it’s not for me to carry around. It’s either the Sergeant or the Staff Sergeant that carries it in their car, and they respond to the call with it—or we have the box in the division or the cells or the ... Wherever it’s needed. So, it’s a response kit [that’s] available, but not everyone has one.

Clearly, different implementation practices were occurring across police divisions within EPS—an issue compounded by considerable confusion among officers about the availability and logistics of accessing Narcan. In most divisions, there were, in fact, ample opportunities for officers to obtain Narcan, but a subset chose not to do so—or did not know it was available. The suggestion that officers could rely on their supervisor to provide Narcan was also intriguing, as all officers presumably know that supervisors do not attend every call. Indeed, in emergencies, supervisors may be working at far ends of the district, making it impossible for them to deliver Narcan in a timely fashion.

5.3.3. Professional division of emergency care responsibilities

Our qualitative interviews highlighted some of the same explanations that officers provided in our web survey for not carrying Narcan, and helped uncover several other themes. For example, police officers’ views on the professional division of labor with physicians or Emergency Medical Services (EMS) personnel also played a role in officers’ willingness to administer Narcan. Some officers distinguished themselves from medical professionals and felt uncomfortable with the prospect of administering Narcan to members of the public—sometimes (incorrectly) believing they were not permitted to do so. As Kevin from EPS told us: “Under our policy, we’re not to administer any drugs to a person.”

Several EPS members suggested that other first responders (i.e., EMS and fire department personnel) who arrive at the scene just as quickly as police were responsible for administering Narcan. Indeed, some EPS members, like David and Marcia, distinguished between administering Narcan and providing other, more traditional, types of “first aid” or emergency services:

Respondent (David): I, um, let them do all the medical stuff, cuz I’m not trained to administer Narcan or stuff like that. I know that if I did, I could get in trouble for it. So, that’s why you wait for EMS, and you just let them do their thing.

Interviewer: But if you ... I’m just thinking out loud here ... if you stumbled across someone who’s got a knife in their chest you can ...

Respondent (Marcia): Administer first aid? Absolutely.

These sentiments were not common among CPS officers, who tended to view the prospect of waiting at the scene of an overdose for other first-responders to arrive and administer Narcan to be at odds with their professional duties. Most acknowledged that, in light of the changing profile of drug use in their city, making assessments about overdoses and

Table 3
Reasons for (never) carrying Narcan^a.

	% of answers provided ^a	
	EPS	CPS
Not needed for my job	41	64
Not available or difficult to access	28	23
Too much hassle	18	0
Someone else carries it	11	6
Other reasons	2	7
Total	100	100
N (respondents)	526	169
N (answers)	612	185

^a Up to two reasons for never carrying Narcan were coded. Five hundred and twenty-six EPS members (out of 592 who never carried) provided 612 answers, while 169 CPS members (out of 176 who never carried) provided 185 answers. Since the number of answers is larger than the number of respondents, and these percentage calculations are based on answers, not respondents, significance tests are not appropriate.

administering Narcan were now part of their job. David's claim about not being trained to administer Narcan is also noteworthy, as both police services had, in fact, provided officers with in-person and online training; however, many officers admitted to ignoring video tutorials or only superficially attending to them.

5.3.4. Legal liability

One key aspect of the successful implementation of any medical initiative concerns "adoption," which refers to a practitioner's readiness to use the intervention (Olswang and Prelock, 2015). In our research, issues about legal liability shaped this adoption process. Officers from both organizations were uncertain about the legal implications of administering (or not administering) Narcan to a citizen experiencing an overdose. Incorrectly believing they were prohibited from providing Narcan to members of the public, these officers anticipated legal liability regardless of the action they chose—creating a faux "Catch-22." As Brandon from EPS explained:

The other thing I've heard lots of guys say, especially on my team, [is] that they don't want to be the person that gets sued. Because the service [EPS] has told us that [Narcan] is for police. So, we're not supposed to use it on people who are overdosing. So, let's say you're the first person at an overdose, it's just you and the person who's overdosing. You breach policy to give them [Narcan] and they die anyways, and it goes to coroner's inquest, and you're that person that gets roasted for breaching policy ... It's a Catch-22 in the sense that, if you use it and they die, well then, you know: "Why did you use it? You're not supposed to use it. Maybe you caused the person's death. You are not medically trained to use it." If you don't use it and they die: "Well, you had it. Why didn't you use it? You're a police officer. You're just watching a person die?" So, it's one of those things where ... what do you do?

Kirsty, an Occupational Health and Safety Consultant who worked with EPS, was one of many individuals who confirmed that fears of professional censure or legal liability were playing a role in officers' reluctance to carry or use Narcan on citizens:

[Officers are] always aware of what public perception is gonna be. So, it's like, "If I give someone this medication, and they die, what's the likelihood of me being liable and facing an investigation from the Alberta Serious Incident Response Team [ASIRT investigates cases involving Alberta police that result in serious injury or death, along with allegations of serious misconduct]" versus "If I don't even have this medication on me, and I do what I can with what I've got, then that's not a factor anymore." Basically, we're getting feedback from some [officers] that they aren't signing it out because they don't want that onus on them—that liability on them to use it. So, I think there's this concern on members' part, "If [...] I use it and the person dies, what's my liability there?" Um, because they know that if they have it, they have to use it, essentially.

Even EPS officers who carried Narcan and indicated they would administer it when needed were uncomfortable with what they perceived to be an ambiguous legal situation. As a result, several, like Brandon, stated they would do what they had to do in an emergency, and deal with any legal consequences down the road: "I am gonna do whatever I can. If it breaches policy to save this person's life, potentially, then great. If they come back and say, "You killed this guy," well, I guess I will deal with it at that time. But I'm gonna try to do what I can. I am not just gonna stand there." Ultimately, concerns about legal liability prompted a subset of (primarily EPS) officers to avoid the issue by simply not carrying Narcan—the upshot being that it might be unavailable in the event that either citizens or officers were exposed.

5.3.5. Limited supply of Narcan reserved for officers

Many officers conceived of Narcan as a "personal use"

product—something they would administer to themselves or a fellow officer experiencing an inadvertent overdose. Several incorrectly believed this was formal police policy. Others, however, were concerned that administering Narcan to citizens would quickly exhaust their supply, leaving them vulnerable should they or other officers need to be revived. The result, as clarified by CPS officer Todd, is that some officers were disinclined to use their Narcan supply on citizens: "... that's the opinion of most [officers]. They're not going to use it on someone other than themselves, or a partner, or a colleague. They're not gonna use it to save someone's [citizen] life. I find that really sad." A substantial minority of interviewees articulated a version of this position, including CPS officer Adrian, who suggested that if he encountered a citizen experiencing an overdose, he would not administer Narcan but instead wait for EMS to arrive:

But, if it's an officer or a security guy or somebody we do know, like we carry [Narcan] more for that than ... to protect ourselves than the bad guy that chooses to [use drugs], right. As bad as that sounds, right ... If you're only carrying a couple doses and you give the first one to the bad guy on the floor and then your partner goes down, and you're still waiting on EMS to get there ...

We can only speculate about what officers might actually do in such a scenario. Still, as CPS officer Cole suggests, we suspect most would likely deliver the medicine: "If we see someone overdosing, we can sit there and be like "He's still breathing, and he's totally out, but I'm saving this [Narcan] for me." We could do that. But a lot of us aren't going to do that." Nevertheless, it is notable that a group of officers weighed such consideration in contemplating if and when they would administer Narcan.

6. Discussion

Fentanyl is prominently contributing to the contemporary opioid crisis (Dasgupta et al., 2018). Research is beginning to demonstrate how the recreational use of fentanyl and its analogues is significantly altering the experiences of people who use drugs (Ciccarone et al., 2017), the operation of correctional institutions (Bucerius and Haggerty, 2019), and the jobs of first responders (Persaud and Jennings, 2019).

Officers from both services in our study tend to view fentanyl as a significant or serious problem and recognize that new synthetic opioids present overdose risks to citizens. They were also concerned about the possible health risks to themselves (and their partners) due to the prospect of inadvertent exposure, even though such risks appear to be extremely low. Officers were aware of Narcan's potential value as a response to overdoses, and most knew how it should be administered. As our interviews illustrate, however, there is an essential distinction between an officer knowing how to administer Narcan and understanding their organization's formal rules and protocols about who can carry and administer it, under what circumstances, and their actual willingness to do so.

Our study represents a classic example of implementation science, in that we sought to understand how a clinically effective treatment (Narcan) is actually applied in practice. Following insights from implementation science (Damschroder and Hagedorn, 2011; Proctor et al., 2011; Powell et al., 2012), our study focused on several administrative, organizational, and personal factors influencing the effectiveness of harm reduction initiatives. With references to the Consolidated Framework for Implementation Research (Damschroder and Hagedorn, 2011), the factors most notably inhibiting the use of Narcan operate in two main domains: the inner setting of the police organization and the characteristics of individuals—the latter encompassing individual knowledge of, and attitudes toward, the intervention.

More specifically, to effectively implement Narcan in a police organization: 1) officers must be sufficiently knowledgeable and concerned about the fentanyl situation to see it as a serious risk to be managed (this was particularly important in the organizations we studied, as carrying

Narcan was often optional); 2) officers must be knowledgeable about Narcan and trained in its use; 3) the medication must be readily available, meaning it must be both physically accessible to officers and that they choose to carry it; 4) officers must be willing to administer Narcan, and; 5) officers must be informed about any liability issues relating to administering the medication (see Davis et al., 2015).

Our most important findings arguably concern officers' access to Narcan and their willingness to administer it (points #3 and #4). Participants in both organizations described different protocols for obtaining Narcan while on duty, with CPS officers being significantly more likely to carry than their Edmonton counterparts. Indeed, there appeared to be a general antipathy toward carrying and using Narcan by EPS officers—evidenced by the much larger percentage of officers who said they did not carry it (76%) and the number and variety of reasons they presented to justify this decision. Some of this reluctance was related to practical concerns (e.g., too much of an inconvenience to sign it out, insufficient space to carry it on their utility belt, a concern that it would not work in cold temperatures). However, this reluctance was also related to being misinformed about several policy-related matters, particularly about Narcan's availability and if (and when) they were permitted to use it on citizens. It is also likely that EPS officers' reluctance to carry Narcan at the same rate as CPS officers is related to a lack of organizational clarity on legal ramifications and a lack of clear organizational directive to carry.

Two particularly concerning factors stand out as reasons officers provided for not administering Narcan. First, numerous officers (incorrectly) believed that they might be legally liable if a citizen died either from their decision to administer or not administer Narcan. Several officers indicated that they managed this "Catch-22" situation by simply not carrying the medication. Second, a sizeable number of officers said they would be disinclined to administer Narcan to a citizen in an emergency out of fear that doing so would consume their "personal supply" of the medication.

It is unclear to what extent the factors officers identified for not carrying and using Narcan should be understood as "reasons" as opposed to "rationalizations" for a decision made for other unarticulated reasons. Evidence that these might be rationalizations can be found in the fact that while officers in Calgary mentioned many of the same concerns about accessing and using Narcan as their Edmonton counterparts, the former did not typically see these as sufficiently burdensome to preclude them from carrying and using the medication. Indeed, for many CPS officers, Narcan was seen as *the* most critical piece of equipment for self-protection and for performing their duties safely and effectively. Any hassles, inconveniences, or regulatory ambiguities were typically not enough to stop them from carrying.

It is also possible that more unpalatable factors could inform an officer's decision not to carry or use Narcan. A growing body of literature from the United States, for example, suggests that police officers are generally opposed to harm reduction strategies and tend to stigmatize people who use drugs (Green et al., 2013; Saunders et al., 2019; Murphy and Russell, 2020; Selfridge et al., 2020). Interestingly, these did not emerge as themes in our research. Not a single EPS or CPS officer referred to these factors in the qualitative interviews, although we did obtain a glimpse of such attitudes in two officers' anonymous comments on our web survey. In clarifying why they did not administer Narcan to citizens, one officer noted, "I don't care if they die" while another wrote a detailed account of the horrific lives led by many of the drug users that officers were repeatedly resuscitating using Narcan. He or she concluded that it might be more humane to simply let them die. That these two comments were outliers in our relatively large dataset suggests that there are likely cross-national differences between American and Canadian police officers' attitudes on drug users and harm reduction strategies.

One methodological limitation of our study is that we have concentrated on officers' descriptions of how they behave, but there can be disconnects between what people say they do and what they do in

practice (Jerolmack and Khan, 2014). Consequently, further research is needed to examine officers' on-the-ground behaviors in relation to their use of Narcan. Future research should also investigate why officers in some police organizations might be more reluctant than those in other organizations to carry and administer Narcan. In our study, this difference might be due to higher levels of opioid overdoses in Calgary (although the number of overdoses in Edmonton was still substantial) or to differences in organizational policies and culture. Such cross-organizational differences should be examined more directly. Also, recall that one reason officers identified for carrying Narcan was to ensure it would be available to them or their partners in the event of an inadvertent exposure or overdose. This raises an additional question for future researchers: as officers come to recognize that it is highly improbable that they or their partner will inadvertently overdose, will they simply stop carrying Narcan?

7. Conclusion and policy recommendations

Our study of two large western Canadian cities provides insights into organizational and cultural influences that appear to limit the health benefits of providing police officers with Narcan. The following policy implications will be of interest to police and public health officials eager to implement effective harm reduction measures to confront the opioid crisis:

1. Police services should consider establishing policies making it mandatory for front-line officers to carry Narcan in jurisdictions where opioid-related overdoses are a concern. Having front-line officers carry and administer Narcan is not only associated with decreased fatalities in opioid overdose victims (Rando et al., 2015), but also greater job satisfaction—attributed to the empowerment and gratification officers obtain from reversing the course of a potentially fatal overdose (Lurigio et al., 2018). Having more officers carry Narcan might also increase the number of dispensers available at the scene of an overdose, thereby reducing officers' anxieties about consuming their "personal" supply on a citizen who is overdosing.
2. Police organizations should provide ongoing training on matters pertaining to opioids. In order of importance, such training should address: a) *administering* Narcan and dealing with opioid overdoses, b) *recognizing* opioid use and overdose symptoms, c) *protecting* citizens and police officers from accidental exposure, d) *related procedures* (e.g., working with EMS and other first responders on how to handle and dispose of fentanyl/carfentanyl appropriately), and e) *general training* (e.g., on drug use, addictions, and prevention strategies).
3. The legalities relating to officers administering Narcan need to be clarified in jurisdictions experiencing high rates of opioid-related overdoses. Several American states have passed legislation or standing orders authorizing the administration of Naloxone by police officers (Davis et al., 2015) while providing them with immunity from professional, civil, and criminal liability so long as it is administered in "good faith" (Wagner et al., 2016). Officials in any jurisdiction where officers are expected to administer Narcan need to ensure that they are free from liability when performing this aspect of their job.
4. Relatedly, a particularly vital part of any communication strategy relating to Narcan must include *unambiguous* information about any legal liability officers might (or might not) assume should they administer Narcan. Any potential health benefits that might stem from providing Narcan to police officers risks being undermined by confusion about authorization and liability issues.
5. A subset of officers were acutely fearful that exposure to even microscopic amounts of fentanyl or carfentanyl (be it airborne or dermal) could lead to an overdose and death. This view is out of step

with the scientific literature, and police organizations should take measures to correct these misperceptions.

- Officials need to clarify the impact of cold weather on Narcan's effectiveness.
- Police organizations should send regular (perhaps bi-annual) reminders to officers of the value of carrying Narcan and administering it as needed.

Finally, we need more embedded qualitative research on how police organizations and their officers incorporate Narcan into routine practices. There are growing bodies of literature on the effectiveness of opioid and Narcan training on police officer attitudes and practices (Ray et al., 2015; Wagner et al., 2016), and on the impact of officer-administered Naloxone in decreasing opioid overdose deaths (Rando et al., 2015). Still, we know little about the contextual factors that limit or facilitate the implementation of this medication. Early identification of these factors, along with their prompt resolve, will improve the effectiveness of police-based Naloxone programs and help save lives.

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