

# Integrated care for pregnant women on methadone maintenance treatment

## Canadian primary care cohort study

Alice Ordean MD CCFP MHSc Meldon Kahan MD CCFP FRCPC FCFP Lisa Graves MD FCFP  
Ronald Abrahams MD CCFP FCFP Talar Boyajian MSc

### Abstract

**Objective** To describe the characteristics of a national cohort of pregnant women on methadone maintenance treatment (MMT) and to provide treatment outcome data for integrated care programs.

**Design** Retrospective chart review.

**Setting** Three different integrated care programs in geographically distinct cities: the Toronto Centre for Substance Use in Pregnancy in Toronto, Ont; the Herzl Family Practice Centre in Montreal, Que; and the Sheway clinic in Vancouver, BC.

**Participants** Pregnant women meeting criteria for opioid dependence and attending an integrated care program between 1997 and 2009. Women were excluded if they were on MMT only for chronic pain.

**Main outcome measures** Patient demographic characteristics, concurrent medical and psychiatric disorders, and substance use outcome data.

**Results** A total of 102 opioid-dependent pregnancies were included. The mean age was 29.7 years and 64% of women were white. Women in Montreal were more likely to have partners and had fewer children. Differences in living and housing situations among the sites tended to resolve by the time of delivery. Almost half of this cohort tested positive for hepatitis C. Women had a high prevalence of depression and anxiety across all sites. Half of this cohort was on MMT before conception and for the other half, MMT was initiated at a mean gestational age of 20.7 weeks, resulting in a mean dose of 82.4 mg at delivery. At the first visit, polysubstance use was common. Prescription opioid use was more frequent in Toronto and heroin use was more prevalent in Vancouver and Montreal. For the entire population, significant reductions were found by the time of delivery for illicit ( $P < .001$ ) and prescription opioids ( $P = .001$ ), cocaine ( $P < .001$ ), marijuana ( $P = .009$ ), and alcohol use ( $P < .001$ ).

**Conclusion** Despite geographic differences, all 3 integrated care programs have been associated with significant decreases in substance use in pregnant opioid-dependent women.

#### EDITOR'S KEY POINTS

- This national cohort of opioid-dependent pregnant women was characterized by a mean age of 29.7 years, white or aboriginal ethnicity, and reliance on social assistance. A history of concurrent psychiatric disorders was also prevalent in this population.
- All 3 programs had excellent clinical outcomes, with marked reductions in heroin, prescription opioid, alcohol, cocaine, and cannabis use from the initial visit to the time of delivery. Despite the variability in services at the 3 sites, the programs were equally effective. This might be attributable to their common treatment philosophy—providing care in a safe environment where women are treated with respect and dignity.

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Exclusivement sur le web

# Soins intégrés pour les femmes enceintes suivant un traitement d'entretien à la méthadone

## Étude de cohorte sur les soins primaires au Canada

Alice Ordean MD CCFP MHSc Meldon Kahan MD CCFP FRCPC FCFP Lisa Graves MD FCFP  
Ronald Abrahams MD CCFP FCFP Talar Boyajian MSc

### Résumé

**Objectif** Décrire les caractéristiques d'une cohorte de femmes enceintes suivant un traitement d'entretien à la méthadone (TEM) et fournir des données sur les résultats des programmes de soins intégrés.

**Type d'étude** Revue rétrospective de dossiers.

**Contexte** Trois programmes de soins intégrés différents dans des villes situées dans des régions distinctes : à Toronto (Ont.) le Centre de Toronto pour l'utilisation de substances pendant la grossesse; à Montréal (Qc) le Centre de médecine familiale Herzi; et à Vancouver (C.-B.) la clinique Sheway.

**Participant** Femmes enceintes répondant aux critères en matière de dépendance aux opiacés et poursuivant un programme de soins intégrés entre 1997 et 2009. Étaient exclues les femmes qui étaient sous TEM uniquement pour des douleurs chroniques.

#### POINTS DE REPÈRE DU RÉDACTEUR

- Dans cette cohorte nationale, les femmes enceintes présentant une dépendance aux opiacés avaient 29,7 ans en moyenne, étaient de race blanche ou d'origine autochtone et dépendaient de l'assistance sociale. Elles avaient aussi une prévalence de maladies psychiatriques dans leur histoire.

- Les 3 programmes ont obtenu des résultats excellents avec, entre la visite initiale et le moment de l'accouchement, une réduction marquée de l'utilisation d'héroïne, d'opiacés sur ordonnance d'alcool, de cocaïne et de cannabis. Même si les services différaient selon les sites, les 3 programmes étaient également efficaces. Cela pourrait être dû au fait qu'ils avaient la même philosophie de traitement : fournir des soins dans un environnement sécuritaire dans lequel les femmes sont traitées avec respect et dignité.

**Principaux paramètres à l'étude** Caractéristiques démographiques des patientes, conditions médicales ou psychiatriques concomitantes et données sur les issues en termes d'abus de substances.

**Résultats** Un total de 102 grossesses avec abus d'opiacés ont été retenues. L'âge moyen des femmes était de 29,7 ans, et 64 % d'entre elles étaient de race blanche. Celles de Montréal étaient plus susceptibles d'avoir des partenaires et avaient moins d'enfants. Les différences entre sites pour ce qui est des conditions de vie et de logement avaient tendance à disparaître au moment de l'accouchement. Près de la moitié des femmes de cette cohorte avaient un test positif pour l'hépatite C. Les femmes présentaient une prévalence élevée de dépression et d'anxiété, et ce, dans les 3 sites. La moitié de la cohorte était déjà sous TEM lors de la conception, tandis que l'autre moitié avait commencé ce traitement durant la grossesse, en moyenne à 20,7 semaines, si bien qu'elles prenaient une dose moyenne de 82,4 mg au moment de l'accouchement. Lors de la première visite, il y avait souvent abus de plusieurs substances. À Toronto, on utilisait plus souvent des opiacés sur ordonnance, alors qu'à Vancouver et Montréal, on utilisait surtout l'héroïne. À l'accouchement, on observait chez toutes les participantes une diminution significative de la consommation d'opiacés illicites ( $P < ,001$ ) ou prescrits ( $P < ,001$ ), de cocaïne ( $P < ,001$ ), de marijuana ( $P = ,009$ ) et d'alcool ( $P < ,001$ ).

**Conclusion** Malgré leur situation géographique différente, les 3 programmes de soins intégrés ont observé des diminutions significatives de la consommation de substances chez des femmes enceintes avec dépendance aux opiacés.

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Opioid dependence during pregnancy is associated with adverse obstetric and neonatal outcomes including an increased risk of premature delivery, intrauterine growth restriction, and higher rates of infant mortality.<sup>1-4</sup> In Canada, more patients are addicted to prescription opioids, such as oxycodone or morphine, than to illicit opioids.<sup>5,6</sup> The actual prevalence of opioid dependence in pregnancy is unknown but it represents a serious public health concern, especially in certain populations such as First Nations communities in northern Ontario, where 17% of newborns are exposed to nonprescribed opioids in utero.<sup>7</sup>

Methadone maintenance treatment (MMT) is the standard of care for treatment of opioid dependence.<sup>8,9</sup> Methadone maintenance treatment has been associated with decreased opioid and other drug use, as well as improved socioeconomic integration.<sup>10,11</sup> In pregnancy, MMT leads to reduced obstetric complications and improved maternal and newborn outcomes.<sup>12</sup>

Owing to the growing prevalence of opioid dependence and the limited Canadian data on MMT during pregnancy, this study aims to provide information on MMT in perinatal populations. The objectives of this study are to describe the characteristics of a national cohort of pregnant women on MMT, to review the prevalence of concurrent medical and psychiatric disorders, and to provide substance use and methadone treatment outcome data. This cohort study represents the first collection of national data related to the use of MMT during pregnancy.

## METHODS

This is a retrospective chart review of pregnant women attending clinics for MMT from 1997 to 2009 in 3 integrated care programs in geographically distinct cities: Vancouver, BC; Toronto, Ont; and Montreal, Que. Inclusion criteria consisted of pregnant women who were opioid dependent and who were already on MMT or eligible for MMT. Women were excluded if they were only on MMT for chronic pain and had no history of opioid dependence.

Ethics approval was received at each site before data collection. A tool was developed and used to collect data on the following parameters: demographic characteristics (age, marital status, gravidity, parity, ethnicity, financial status, housing status, and living situation), substance use history, and methadone outcome data. Data entry was performed by one person (T.B.) under the supervision of 2 authors (A.O. and R.A.) in Toronto and Vancouver. In Montreal, data entry was performed by a different person under supervision of L.G. Five charts from this site were independently reviewed by T.B. and interrater reliability was established. Basic descriptive statistics were used to summarize maternal characteristics and substance use outcomes. Differences in proportions and means were analyzed using  $\chi^2$  tests and *t* tests in SPSS, version 18.

## Program descriptions

Pregnant women attended primary care programs based on integrated care models. These programs incorporated comprehensive addiction and obstetric care at a single-access site. The Toronto Centre for Substance Use in Pregnancy and the Herzl Family Practice Centre in Montreal are based within hospitals, whereas Sheway in Vancouver is community based. Women with problematic substance use prefer integrated care programs owing to reduced stigma and fewer barriers to care.<sup>13</sup>

**Toronto Centre for Substance Use in Pregnancy.** The Toronto Centre for Substance Use in Pregnancy is located in the Family Medicine Centre at St Joseph's Health Centre, which is a community teaching hospital affiliated with the University of Toronto. Team members include a primary care physician, a nurse, and a social worker. The Toronto Centre for Substance Use in Pregnancy sees 40 to 60 pregnant women per year, most of whom are opioid dependent.<sup>14</sup>

**Herzl Family Practice Centre.** The Herzl Family Practice Centre in Montreal is located within the Jewish General Hospital. Similar to the Toronto Centre for Substance Use in Pregnancy, the team physician and nurse dyad manage these patients with the help of a hospital social worker and psychologist. This program sees 3 to 4 pregnant women per year, mainly those who are opioid dependent and who are socially stable.

**Sheway.** The Sheway clinic is located in the Downtown Eastside of Vancouver, one of the poorest neighbourhoods in Canada.<sup>15</sup> This program has an expanded team including social workers, an addiction counselor, community health nurses, and physicians. Services such as a hot lunch program, food vouchers, and infant clothing are also provided. Sheway has an average yearly case load of 60 pregnant women and their families.<sup>16</sup>

All 3 programs use a harm-reduction, woman-centred approach to care in order to increase treatment retention. Harm reduction focuses on reducing drug-related harm without requiring cessation of drug use.<sup>17,18</sup> Woman-centred care encourages the woman to be an equal partner with health care providers and allows them autonomous decision making.<sup>19</sup> A central element of this approach is that women have control over the services they receive.

## RESULTS

### Maternal characteristics

A total of 102 opioid-dependent pregnancies were included in the final analysis. Demographic variables for this patient population are presented in **Tables 1 to 3**. The mean age at delivery was 29.7 years, with a range of 18

to 41 years. Sixty-five (64%) of these women were white and 21 (20%) were of aboriginal descent. Almost two-thirds of these women were receiving social assistance. Significant differences were noted for marital status and parity between the different sites: women in Montreal had fewer children ( $P=.017$ ) and were more likely to have partners ( $P=.001$ ) than women in Toronto or Vancouver.

Living and housing situations also varied significantly by geographic site. Women in Montreal were significantly more likely to be living with partners ( $P=.005$ ) and less likely to be living with relatives or friends at the first visit ( $P=.463$ ). Women in Vancouver were more likely to be

in unstable housing situations such as living in a shelter ( $P=.006$ ) or being homeless ( $P=.007$ ) than those in Toronto were. These geographic differences in living and housing characteristics disappeared by the time of delivery.

For the cohort as a whole, there were no significant changes in living situation or housing status from the first visit to discharge. However, there was a trend toward more stable housing by discharge, with fewer women reporting homelessness ( $P=.121$ ) and more in shelters ( $P=.142$ ). The movement to shelters is consistent with more women living alone by the end of their pregnancies ( $P=.146$ ).

**Table 1. Maternal demographic characteristics**

CHARACTERISTIC	SITE			TOTAL COHORT (N = 102)	P VALUE
	TORONTO (N = 44)	VANCOUVER (N = 36)	MONTREAL (N = 22)		
Mean (SD) age at delivery, y	30.2 (5.2)	29.2 (5.4)	29.8 (6.0)	29.7 (5.4)	.718
Marital status, n (%)					
• Single	24 (55)	23 (64)	3 (14)	50 (49)	.001*
• Married or partnered	20 (45)	13 (36)	19 (86)	52 (51)	.001*
Mean (SD) gravidity	3.6 (2.0)	3.7 (2.0)	3.7 (1.8)	3.6 (2.0)	.989
Mean (SD) parity	2.1 (1.1)	2.6 (1.4)	1.7 (0.8)	2.2 (1.2)	.017*
Ethnicity, n (%)					
• White	29 (66)	14 (39)	22 (100)	65 (64)	<.001*
• Aboriginal	2 (4)	19 (53)	0 (0)	21 (20)	<.001*
• Asian	6 (14)	1 (3)	0 (0)	7 (7)	.104
• Other	7 (16)	2 (5)	0 (0)	9 (9)	.077
Financial status, n (%)					
• Employed	10 (23)	0 (0)	7 (32)	17 (16)	<.001*
• Dependent on social assistance	25 (57)	26 (72)	11 (50)	62 (61)	.188
• Dependent on family or friends	6 (13)	1 (3)	2 (9)	9 (9)	.237
• No income or income from prostitution	3 (7)	9 (25)	2 (9)	14 (14)	.065
Living with children, n (%)	15 (34)	3 (8)	0 (0)	18 (18)	<.001*

\*Indicates significant difference at  $P < .05$ .

**Table 2. Living situation**

LIVING SITUATION	SITE, N (%)			TOTAL COHORT (N = 102), N (%)	P VALUE
	TORONTO (N = 44)	VANCOUVER (N = 36)	MONTREAL (N = 22)		
At first visit					
• With partner	23 (52)	16 (44)	19 (86)	58 (57)	.005*
• With parents, relatives, or friends	10 (23)	10 (28)	3 (14)	23 (22)	.463
• Alone	11 (25)	10 (28)	0 (0)	21 (21)	.012*
At discharge					
• With partner	25 (57)	9 (25)	19 (86)	53 (52)	<.001*
• With parents, relatives, or friends	7 (16)	9 (25)	3 (14)	19 (19)	.517
• Alone	12 (27)	18 (50)	0 (0)	30 (29)	<.001*

\*Indicates significant difference at  $P < .05$ .

**Table 3. Housing status**

HOUSING STATUS	SITE, N (%)			TOTAL COHORT (N = 102), N (%)	P VALUE
	TORONTO (N = 44)	VANCOUVER (N = 36)	MONTREAL (N = 22)		
At first visit					
• House or apartment	39 (89)	19 (53)	22 (100)	80 (78)	<.001*
• Shelter	4 (9)	10 (28)	0 (0)	14 (14)	.006*
• Homeless	1 (2)	7 (19)	0 (0)	8 (8)	.007*
At discharge					
• House or apartment	39 (89)	16 (44)	22 (100)	77 (75)	<.001*
• Shelter	3 (7)	19 (53)	0 (0)	22 (22)	<.001*
• Homeless	2 (4)	1 (3)	0 (0)	3 (3)	.797

\*Indicates significant difference at  $P < .05$ .

### Medical and mental health status

Maternal health conditions are described in **Table 4**. Almost half of this cohort tested positive for hepatitis C but only 4% tested positive for hepatitis B. There was a significant difference in rates of hepatitis C, with just over 60% of pregnant women infected in Vancouver and Montreal compared with only 27% in Toronto ( $P = .002$ ). Vancouver is the only city that reported 2 cases each of HIV and syphilis.

With respect to psychiatric comorbidities, there was no significant difference among the 3 sites. Approximately 45% of the women had a diagnosis of depression and approximately 20% had a diagnosis of anxiety (**Table 5**). Women were receiving pharmacotherapy, with equal numbers treated with benzodiazepines or antidepressants such as selective serotonin reuptake inhibitors, selective noradrenergic reuptake inhibitors, or bupropion. A history of abuse was also common among these women, with 35% reporting physical or sexual abuse. Fifteen percent admitted to suicidal thoughts or attempts. More pregnant women in Toronto (48%) and Vancouver (33%) reported a history of abuse than women in Montreal (14%). True prevalence rates might be higher as women are less likely to disclose abuse owing to fear that their children will be taken by child services.

### Drug use history

Concomitant abuse of prescription and illicit drugs occurred frequently in this patient population (**Table 6**). At the first visit, nicotine was the most commonly used legal drug (87%). With respect to illicit drug use, heroin or cocaine were used by almost 50% of the population. Approximately 25% of the study population reported use of alcohol, marijuana, benzodiazepines, or prescription opioids. Cocaine ( $P < .001$ ), heroin ( $P < .001$ ), prescription opioids ( $P < .001$ ), and marijuana use ( $P = .034$ ) varied significantly among the 3 sites. The Vancouver cohort was more likely to be using heroin (81%) and cocaine (75%), whereas the Toronto cohort was more likely to be using prescription opioids (48%). A greater proportion of pregnant women in Toronto also reported marijuana use. By the time of delivery, significant differences remained for heroin ( $P = .010$ ) and benzodiazepine use ( $P = .005$ ) among the sites (**Table 6**). Pregnant women in Vancouver were more likely to use both heroin and benzodiazepines. The Montreal cohort also reported higher rates of heroin use.

For the entire population, there were significant reductions in use of all substances by the time of delivery except for nicotine and benzodiazepines (**Table 7**). Illicit and prescription opioid use dropped

**Table 4. Maternal health status**

MEDICAL CONDITION	SITE, N (%)			TOTAL COHORT (N = 102), N (%)	P VALUE
	TORONTO (N = 44)	VANCOUVER (N = 36)	MONTREAL (N = 22)		
Hepatitis B	0 (0)	2 (6)	2 (9)	4 (4)	.111
Hepatitis C	12 (27)	22 (61)	14 (64)	48 (47)	.002*
Syphilis	0 (0)	2 (6)	0 (0)	2 (2)	NA
HIV	0 (0)	2 (6)	0 (0)	2 (2)	NA
Zidovudine use during labour	0 (0)	8 (22)	0 (0)	8 (8)	NA

NA—not applicable.

\*Indicates significant difference at  $P < .05$ .

at all 3 sites, from 46% to 16% for heroin ( $P < .001$ ) and from 27% to 10% for prescription opioids ( $P = .001$ ). Cocaine use dropped from 44% to 19% ( $P < .001$ ), marijuana use from 21% to 7% ( $P = .009$ ), and alcohol use from 25% to 5% ( $P < .001$ ).

### Methadone maintenance treatment

For this cohort, half the patients presented while already taking methadone before conception, with an average methadone dose of 67.6 mg (Table 8). Significantly more women were already on MMT before pregnancy

**Table 5. Psychiatric conditions and treatment**

PSYCHIATRIC CONDITION OR TREATMENT	SITE, N (%)			TOTAL COHORT (N = 102), N (%)	P VALUE
	TORONTO (N = 44)	VANCOUVER (N = 36)	MONTREAL (N = 22)		
Psychiatric condition					
• Major depression	16 (36)	21 (58)	9 (41)	46 (45)	.131
• Anxiety disorder	14 (32)	5 (14)	2 (9)	21 (21)	.058
• Other*	5 (11)	8 (22)	4 (18)	17 (17)	.429
• Abuse (physical or sexual)	21 (48)	12 (33)	3 (14)	36 (35)	.023 <sup>†</sup>
• Suicidal thoughts or attempts	9 (20)	5 (14)	1 (5)	15 (15)	.224
Current pharmacotherapy					
• Benzodiazepines	6 (14)	24 (67)	5 (23)	35 (34)	< .001 <sup>†</sup>
• Antipsychotics	0 (0)	4 (11)	0 (0)	4 (4)	NA
• Other <sup>‡</sup>	16 (36)	10 (28)	9 (41)	35 (34)	.552

NA—not applicable.

\*Includes schizophrenia, bipolar disorder, and eating disorders.

<sup>†</sup>Indicates significant difference at  $P < .05$ .

<sup>‡</sup>Consists of selective serotonin reuptake inhibitors, selective noradrenergic reuptake inhibitors, trazodone, and bupropion.

**Table 6. Substance use in pregnancy**

SUBSTANCE	SITE, N (%)			TOTAL COHORT, N (%)	P VALUE FOR DIFFERENCE BETWEEN SITES
	TORONTO	VANCOUVER (N = 36)	MONTREAL (N = 22)		
At first visit*					
• Alcohol	15 (34)	7 (19)	4 (18)	26 (25)	.220
• Nicotine	35 (80)	34 (94)	20 (91)	89 (87)	.142
• Cocaine or crack	14 (32)	27 (75)	4 (18)	45 (44)	< .001 <sup>†</sup>
• Heroin	7 (16)	29 (81)	11 (50)	47 (46)	< .001 <sup>†</sup>
• Marijuana	14 (32)	3 (8)	4 (18)	21 (21)	.034 <sup>†</sup>
• Benzodiazepines	15 (34)	6 (17)	4 (18)	25 (25)	.145
• Prescription opioids	21 (48)	4 (11)	3 (14)	28 (27)	< .001 <sup>†</sup>
At delivery <sup>†</sup>					
• Alcohol	1 (3)	2 (6)	2 (9)	5 (5)	.635
• Nicotine	23 (64)	30 (83)	19 (86)	72 (77)	.070
• Cocaine or crack	4 (11)	10 (28)	4 (18)	18 (19)	.184
• Heroin	1 (3)	8 (22)	6 (27)	15 (16)	.010 <sup>†</sup>
• Marijuana	4 (11)	2 (6)	1 (4)	7 (7)	.687
• Benzodiazepines	4 (11)	16 (44)	5 (23)	25 (27)	.005 <sup>†</sup>
• Prescription opioids	4 (11)	2 (6)	3 (14)	9 (10)	.560

\*N = 44 for the Toronto cohort and N = 102 for the total cohort.

<sup>†</sup>Indicates significant difference at  $P < .05$ .

<sup>‡</sup>N = 36 for the Toronto cohort and N = 94 for the total cohort.

**Table 7. Total cohort substance use at first visit compared with at delivery**

SUBSTANCE	TOTAL COHORT (TORONTO, VANCOUVER, MONTREAL), N (%)		P VALUE
	AT FIRST VISIT (N = 102)	AT DELIVERY (N = 94)	
Alcohol	26 (25)	5 (5)	<.001*
Nicotine	89 (87)	72 (77)	.052
Cocaine or crack	45 (44)	18 (19)	<.001*
Heroin	47 (46)	15 (16)	<.001*
Marijuana	21 (21)	7 (7)	.009*
Benzodiazepines	25 (25)	25 (27)	.738
Prescription opioids	28 (27)	9 (10)	.001*

\*Indicates significant difference at P < .05.

in Montreal and Toronto than in Vancouver ( $P = .010$ ). The other half were initiated on methadone at an average gestational age of 20.7 weeks. There were no significant differences in mean methadone dose at the first visit or at the time of delivery among the 3 sites. The mean methadone dose for women increased from the first to the third trimester, with a mean methadone dose of 82.4 mg at delivery. This is in keeping with previous literature, which demonstrated greater methadone clearance as the pregnancy progressed, leading to lower plasma methadone concentrations.<sup>20,21</sup> Split dosing of methadone occurred in 34% of cases, with more women in Vancouver (50%) taking split doses than those in Toronto (23%) or Montreal (32%) ( $P = .027$ ).

## DISCUSSION

This national cohort of opioid-dependent women was characterized by a mean age of 29.7 years, white or aboriginal ethnicity, and reliance on social assistance. In

comparison with other studies, our patient population shares some similar demographic characteristics with other pregnant women in MMT with respect to age, ethnic background ( $\geq 50\%$  white), and socioeconomic status (higher rates of unemployment).<sup>22-24</sup>

However, there were significant differences among our 3 site cohorts in living and housing situations. As previously documented in an outcome study of Sheway services,<sup>15</sup> a higher proportion of the Vancouver cohort was homeless, possibly because heroin and cocaine users tend to be less socially stable than noninjecting prescription opioid users, and Vancouver has inadequate housing resources. This also explains the higher percentage of women living independently, without their children or partners.

In addition, as reported in the literature, a history of concurrent psychiatric disorders is also prevalent in this population.<sup>23,25</sup> Depression and anxiety were commonly self-reported, with most receiving pharmacotherapy for these disorders. Benzodiazepine prescribing was much more common in Vancouver, which reflects differences in practice patterns. This increase is associated with benzodiazepine use for cocaine withdrawal management and for treatment of anxiety.

Substance use patterns were also reflective of previously documented geographic differences in substance use.<sup>5</sup> Heroin use tended to be more common in Vancouver whereas prescription opioid use was more commonly reported in Toronto. These trends in substance use also paralleled significantly higher prevalence rates of hepatitis C and HIV among pregnant women in Vancouver.

All 3 programs had excellent clinical outcomes, with marked reductions in heroin, prescription opioid, alcohol, cocaine, and cannabis use from initial visit to the time of delivery. These data confirm the effectiveness of integrated treatment programs, where obstetric and addiction care is provided by interprofessional teams

**Table 8. Methadone dosing**

METHADONE DOSING	SITE			TOTAL COHORT (N = 102)	P VALUE
	TORONTO (N = 44)	VANCOUVER (N = 36)	MONTREAL (N = 22)		
Taking methadone at conception, n (%)	25 (57)	12 (33)	16 (73)	53 (52)	.010*
Mean (SD) gestational age at methadone initiation, wk	2.4 (8.9)	19.9 (7.9)	18.3 (9.6)	20.7 (8.4)	.506
Mean (SD) methadone dose, mg					
• Before pregnancy	60.3 (51.4)	62.6 (34.3)	84.8 (26.9)	67.6 (42.8)	.208
• End of first trimester	59.2 (45.3)	64.3 (30.8)	74.1 (35.1)	64.6 (39.0)	.448
• End of second trimester	66.9 (47.0)	73.2 (38.3)	87.9 (36.0)	74.0 (42.0)	.202
• At delivery	73.5 (49.6)	85.7 (41.2)	93.9 (41.8)	82.4 (45.3)	.202
• Postpartum (up to 6 wk)	74.6 (49.1)	79.0 (41.0)	93.3 (41.2)	80.6 (44.5)	.288
Split dose, n (%)	10 (23)	18 (50)	7 (32)	35 (34)	.027*

\*Indicates significant difference at P < .05.

of family physicians, nurses, and counselors. Numerous studies have documented the benefits of this model of care for pregnant women, including enhanced prenatal and addiction care, as well as reduced drug and alcohol use.<sup>25-28</sup> Despite the variability in services at the 3 sites, the programs were equally effective. This might be attributable to their common treatment philosophy—providing care in a safe environment where women are treated with respect and dignity.

## Limitations

There were several limitations associated with data collection from charts at different sites. There was inconsistent documentation in charts leading to omissions in data. Women with incomplete data sets were excluded from this analysis. Under-reporting of substance use might be owing to pregnant women failing to report drug use and health care providers omitting information in patient charts.

## Conclusion

This study represents the first national cohort of pregnant women in MMT. The availability of methadone within a primary care-based, integrated program has been associated with substantial decreases in substance use in this patient population. 🌿

**Dr Ordean** is Medical Director of the Toronto Centre for Substance Use in Pregnancy at St Joseph's Health Centre in Toronto, Ont, and Assistant Professor in the Department of Family and Community Medicine at the University of Toronto. **Dr Kahan** is Medical Director of the Addiction Medicine Service at St Joseph's Health Centre in Toronto and Associate Professor in the Department of Family and Community Medicine at the University of Toronto. **Dr Graves** is Associate Dean of the Undergraduate Medical Education Program at the Northern Ontario School of Medicine in Sudbury. **Dr Abrahams** is Clinical Professor in the Department of Family Practice at the University of British Columbia in Vancouver and Medical Director of the Perinatal Addictions Team at the BC Women's Hospital and Health Centre in Vancouver. **Ms Boyajian** is a medical student at the University of Toronto.

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### Contributors

All authors contributed to the development of the project, data analysis, and preparation of the manuscript.

### Competing interests

None declared

### Correspondence

**Dr Alice Ordean**, Department of Family Medicine, St Joseph's Health Centre, 30 The Queensway, Toronto, ON M6R 1B5; telephone 416 530-6860; fax 416 530-6160; e-mail [ordeaa@stjoe.on.ca](mailto:ordeaa@stjoe.on.ca)

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