Editor's key points

- This survey of Canadian facilities offering first-trimester surgical abortions and physicians providing this service in 2012 is the most comprehensive account to date of the 2012 work force and their clinical practice in Canada.
- Family physicians represented more than half of survey respondents, and more than 70% of first-trimester surgical abortions were provided in community-based clinics.
- These data indicate first-trimester abortion services across Canada were performed in alignment with practice guidelines in important aspects such as ultrasound use, cervical preparation, use of anesthesia, and postoperative care.
- These data will be helpful in interpreting abortion practice techniques and work force changes that might have occurred since mifepristone became available in Canada.

First-trimester surgical abortion practice in Canada in 2012

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Abstract

Objective To evaluate practices among first-trimester surgical abortion facilities and providers in Canada in 2012 and examine the characteristics of the surgical abortion work force.

Design Self-administered paper or electronic survey adapted from a survey previously fielded in the United States.

Setting Canada.

Participants Facility administrators and physicians.

Main outcomes measures Descriptive statistics on reported first-trimester surgical abortion practice and provider demographic characteristics.

Results Eighty-three percent of identified facilities (78 of 94) and 178 physicians responded. Of the respondents, 99% of facilities and 96% of physicians provided first-trimester surgical abortions. Responding facilities provided 68,154 first-trimester surgical abortions in 2012. This represented 96% of their reported total (combined medical and surgical) first-trimester abortions. More than half (55%) of responding facilities were community based, while 45% were hospital affiliated. Most physician providers were female (68%) and were family doctors (59%). Preoperatively, 96% of physicians routinely used ultrasound and 89% gave perioperative antibiotics. Almost half (48%) used manual vacuum aspiration, but less than 35% did so beyond 9 weeks after the last menstrual period. At most facilities, most procedures were performed under combined local anesthesia and intravenous sedation (73%); only 7% indicated deep sedation or general anesthesia were used exclusively. Postoperatively, 81% of physicians performed immediate tissue examination and 96% offered postabortion contraception on the same day as the abortion. Other assessed outcomes included medication regimens and cervical preparation, with a high degree of consistency among facilities and physicians.

Conclusion First-trimester surgical abortion providers are mostly family physicians and most are female. Practices across Canada were mostly uniform and followed evidence-based guidelines. Uptake of the most recent Canadian practice guidelines may help further standardize patient care and improve routine perioperative antibiotic use and immediate tissue examination.

La pratique des avortements chirurgicaux au premier trimestre au Canada en 2012

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Résumé

Objectif Évaluer les pratiques exercées par les établissements et les prestataires offrant des avortements chirurgicaux au premier trimestre au Canada en 2012 et examiner les caractéristiques des effectifs pratiquant des avortements chirurgicaux.

Type d'étude Un sondage autoadministré sur papier ou électronique, adapté d'un sondage effectué antérieurement aux États-Unis.

Contexte Le Canada.

Participants Des administrateurs d'établissements et des médecins.

Principaux paramètres à l'étude Les statistiques descriptives sur la pratique des avortements chirurgicaux au premier trimestre et les caractéristiques démographiques des prestataires.

Résultats Quelque 83 % des établissements identifiés (78 sur 94) et 178 médecins ont répondu au sondage. Parmi les répondants, 99 % des établissements et 96 % des médecins effectuaient des avortements chirurgicaux au premier trimestre. Les établissements ayant répondu au sondage ont effectué 68,154 avortements chirurgicaux au premier trimestre en 2012. Ce nombre représentait 96 % du total des avortements au premier trimestre qu'ils ont signalés (médicaux et chirurgicaux combinés). Plus de la moitié (55 %) des établissements participants étaient basés dans la communauté, tandis que 45 % étaient affiliés à un hôpital. La plupart des prestataires étaient des femmes (68 %) et des médecins de famille (59 %). Avant l'intervention, 96 % des médecins utilisaient systématiquement l'échographie et 89 % prescrivaient des antibiotiques périopératoires. Près de la moitié d'entre eux (48 %) utilisaient l'aspiration manuelle intra-utérine, mais moins de 35 % s'en servaient au-delà de 9 semaines après le dernier cycle menstruel. Dans la plupart des établissements, la majorité des interventions étaient effectuées sous anesthésie locale combinée à une sédation par voie intraveineuse (73 %); seulement 7 % ont indiqué avoir utilisé exclusivement une sédation profonde ou l'anesthésie générale. Après l'intervention, 81 % des médecins procédaient à un examen immédiat des tissus et 96 % offraient le même jour que l'avortement un moyen de contraception. Au nombre des autres éléments évalués figuraient les régimes pharmacologiques et la préparation du col, et les résultats étaient très uniformes d'un établissement ou d'un médecin à l'autre.

Conclusion Les prestataires d'avortements chirurgicaux au premier trimestre sont majoritairement des médecins de famille, et la plupart sont des femmes. Les pratiques suivies au Canada étaient majoritairement uniformes et conformes aux lignes directrices fondées sur des données probantes. L'adoption des lignes directrices de pratique clinique canadiennes les plus récentes pourrait contribuer à uniformiser davantage les soins aux patientes, et à améliorer le recours systématique à des antibiotiques périopératoires et à l'examen immédiat des tissus.

Points de repère du rédacteur

- Ce sondage effectué auprès des établissements canadiens qui offraient des avortements chirurgicaux au premier trimestre et des médecins qui dispensaient de tels services en 2012 est la compilation la plus complète jusqu'à présent des effectifs et de leur pratique clinique en 2012.
- Les médecins de famille comptaient pour plus de la moitié des répondants au sondage, et plus de 70 % des avortements chirurgicaux au premier trimestre avaient été effectués dans des cliniques communautaires.
- Ces données indiquent que les services d'avortement au premier trimestre dans toutes les régions du Canada ont été fournis conformément aux lignes directrices de pratique clinique en ce qui a trait à des aspects importants comme le recours à l'échographie, la préparation du col, l'utilisation de l'anesthésie et les soins postopératoires.
- Ces données seront utiles pour interpréter les techniques de la pratique des avortements, de même que les changements dans les effectifs qui pourraient s'être produits depuis la disponibilité de la mifépristone au Canada.

Induced abortion is common in Canada, with 97,764 abortions reported to the Canadian Institute for Health Information (CIHI) for 2016.[1] The Canadian Institute for Health Information reports on numbers of abortions in Canada but not on the work force or their clinical practices.[2] Based on provincial health regulations, until 2017 only physicians could provide abortion services. National and international guidelines on evidence-based abortion care have been available since 2006.[3-8] While prior studies have examined clinical practices among providers based in the United States (US) in 1997, 2002, and 2012,[9-11] and among those in British Columbia (BC) in 2011,[12] there are no data on the extent to which these guidelines are followed across Canada or on the demographic characteristics of these physicians.

We aimed to survey all surgical abortion facilities and their providers in Canada to document their work force and abortion practices. We report here on first-trimester surgical abortion practices; findings on abortion health services distribution, first-trimester medication abortion (MA) practices in Canada, and MA and surgical abortion practices in the US have been reported previously.[11,13-16]

Methods

We conducted a cross-sectional survey among abortion providers in Canada from July through November 2013. We identified abortion service provider facilities through online and telephone directories and through professional networks. We distributed a self-administered questionnaire on abortion services provided in 2012 in every Canadian region. Detailed methods have been described previously.[14] We based the survey on an existing instrument used in the US, which we adapted for use in Canada.[9,10,12] English and French survey versions were piloted by practising Anglophone and Francophone abortion providers to ensure accuracy and relevance. Three types of survey booklets were distributed to each facility: 1 for administrators (questions on overall facility services and experiences) and 1 each for surgical abortion providers and MA providers (each had questions on provider demographic characteristics, their practices, and experiences with stigma).

This analysis will focus on the reported practices and provider characteristics for first-trimester surgical abortion (before 14 weeks' gestation).

Survey distribution and collection

We distributed the surveys via mail and e-mail in language-appropriate print and Internet-based formats. At weeks 1, 2, 4, and 6 we employed Dillman techniques (call, fax, and e-mail) for reminders.[17] We invited responses from an administrator as well as up to 5 surgical abortion and 5 MA providers at each facility.

Data entry and analysis

We employed verified double entry for all data from written survey booklets. In addition to descriptive statistics, we compared practices by facility and physician characteristics using Fisher exact tests for categorical variables and *t* tests, ANOVA, Wilcoxon rank sum tests, or Spearman rank correlation for continuous variables. For facility characteristics, we examined regional differences, facility type, and size (categorized by the total number of first- and second-trimester surgical abortions and MAs provided annually, defined as small [<500 cases], medium [500 to 1000 cases], or large [>1000 cases]). For clinician differences, we examined age, sex, years of experience, and specialty. We used R software for data analysis.[18]

The University of British Columbia Children's and Women's Health Centre of British Columbia Research Ethics Board approved the study, as did the Human Research Protection Program Integrated Institutional Review Board of the City University of New York related to the overall conduct of the project, which included data collection in the US.

Results

We identified 94 facilities across Canada, of which 78 (83%) responded; 74 facilities (79%) returned administrator surveys and 171 first-trimester surgical abortion providers returned surgical abortion provider surveys (**Figure 1**). Almost all facilities (n=73) offered first-trimester surgical abortions. Moreover, 167 physicians answered the remaining questions regarding surgical abortion.

Facility characteristics

Facilities reported 68,154 first-trimester surgical abortions in 2012. This represented 90% of the combined total number of first- and second-trimester abortions reported in our previously published survey results,[13,14] and 96% of the combined medical and surgical first-trimester procedures reported in our survey. One-third of the facilities were large and provided 78% of reported first-trimester surgical abortions (**Table 1**).

More than half of identified first-trimester surgical abortion facilities were in Québec (55%), and they provided one-third of the first-trimester surgical abortions reported (**Table 1**). Facility size varied significantly between regions; two-thirds of 40 responding clinics from Québec were small, while most of the 7 clinics from Ontario (86%) and all 5 clinics from the Prairies were large ($P<.01$).

Consistently across Canada, more than 70% of first-trimester surgical abortions were provided in community-based clinics rather than in hospitals. Procedure volume per individual provider was higher in community clinics than in hospital settings, with a median of

Figure 1. Distribution and responses received by type of survey

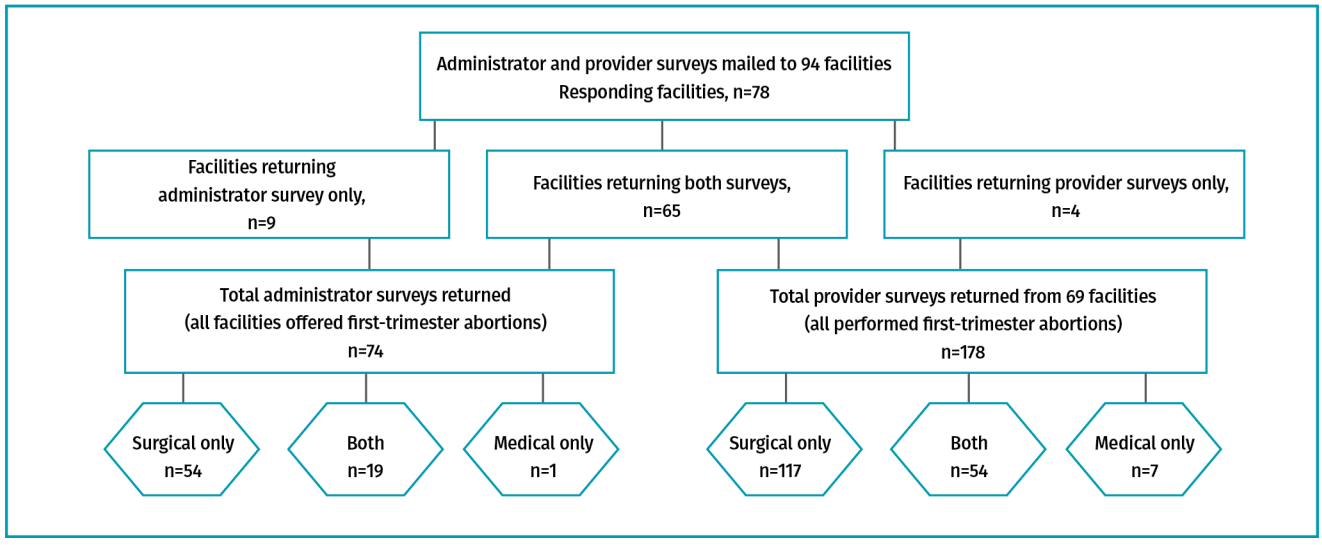


Table 1. Characteristics of Canadian facilities offering first-trimester abortion in 2012 (administrator survey): *N=73.*

CHARACTERISTICS	FACILITIES, n (%)	FIRST-TRIMESTER SURGICAL ABORTIONS, n (%)	ALL FIRST-TRIMESTER ABORTIONS, n (%)	PROPORTION OF FIRST-TRIMESTER ABORTIONS THAT WERE SURGICAL, %
Facility size, by number of abortions per year				
• Small (<500)	37 (51)	6088 (9)	6806* (10)	90*
• Medium (500-1000)	12 (16)	8814 (13)	8814 (12)	100
• Large (>1000)	24 (33)	53,252 (78)	55,225 (78)	96
Region				
• Atlantic	4 (5)	3318 (5)	3318 (5)	100
• BC	14 (19)	11,608 (17)	13,850 (20)	84
• Ontario	7 (10)	14,994 (22)	15,095 (21)	99
• Québec	40 (55)	22,319 (33)	22,381 (32)	100†
• Prairies	5 (7)	15,389 (23)	15,648* (22)	98
• Territories	3 (4)	526 (1)	553 (1)	95
Facility type				
• Community-based	40 (55)	48,404 (71)	50,869* (72)	95
• Hospital-affiliated	33 (45)	19,750 (29)	19,976 (28)	99
Total	73 (100)	68,154 (100)	70,845* (100)	96

BC—British Columbia.
*This table does not include 15 medical abortions reported from 1 facility that performed medical abortion only.
†Less than 0.5% were medical abortions.

300 procedures (interquartile range [IQR]=100 to 700) versus 150 (IQR=39 to 250; *P*<.01).

One-third of facilities provided surgical abortion beginning at 5 weeks' gestation and 95% of community-based clinics and 71% of hospital-affiliated facilities offered surgical abortion services (*P*=.06) by 7 weeks' gestation. Nearly half (44%) of the facilities provided surgical abortion up to or beyond 14 weeks' gestation.

Physician characteristics

Participating physicians reported 52,028 first-trimester surgical abortions in 2012, which represented 76% of all abortion procedures reported by the facilities. A limit of 5 physicians per facility were permitted to respond to the surgical abortion provider survey; therefore, the total number of procedures in larger facilities was under-reported. Contraception and abortion care were

reported to be on average (SD) 40% (34%) of physicians' overall clinical practices.

Table 2 details characteristics of first-trimester surgical abortion providers. Female physicians were more likely to be FPs than male physicians were (65% vs 44%, *P*=.03).

Table 2. Distribution of physicians performing first-trimester surgical abortions in Canada in 2012 by age, sex, region, specialty, and experience: *N=167 providers. Percentages may add to more than 100% due to rounding.*

CATEGORY	PROVIDERS, n (%)	PROCEDURES (N=52,028),* n (%)
Age, y		
• <30	5 (3)	130 (<1)
• 30-39	40 (24)	6492 (12)
• 40-49	41 (25)	12,539 (24)
• 50-59	41 (25)	15,001 (29)
• ≥60	37 (22)	17,836 (34)
• Unknown	3 (2)	30 (<1)
Sex		
• Male	54 (32)	20,132 (39)
• Female	113 (68)	31,896 (61)
Region		
• Atlantic	9 (5)	2658 (5)
• BC	26 (16)	7971 (15)
• Ontario	21 (13)	8233 (16)
• Québec	86 (51)	21,468 (41)
• Prairies	18 (11)	11,177 (21)
• Territories	7 (4)	521 (1)
Specialty		
• Family medicine	98 (59)	38,785 (75)
• Obstetrics and gynecology	60 (36)	12,249 (24)
• Other†	7 (4)	994 (2)
• Unknown	2 (1)	NR
Experience, y		
• ≤5	34 (20)	6420 (12)
• >5-10	24 (14)	3291 (6)
• >10-15	21 (13)	6744 (13)
• >15-20	25 (15)	8464 (16)
• >20-25	19 (11)	7653 (15)
• >25	41 (25)	19,096 (37)
• Unknown	3 (2)	360 (1)

BC—British Columbia, NR—not reported.
*Some providers did not answer the questions about the volume of procedures they perform annually—the estimated volume does not account for those providers.
†*Other* includes emergency medicine, surgery, and general surgery specialties.

Family physicians performed more procedures per physician (median 250, IQR=120 to 600) compared with other specialists (median 96, IQR=24 to 250, *P*<.0001). Male providers were on average 12.5 years older than female providers (mean [SD] 57.5 [12.1] years vs 45.1 [10.3] years, *P*<.0001). There was a significant positive correlation between older age and higher annual procedure volume (Spearman ρ=0.37, 95% CI 0.23 to 0.50).

Preoperative procedures and techniques

Ultrasound was the most commonly used method to confirm gestational age (GA) (96% of participants). Multiple answers for dating criteria were allowed and participants reported also using last menstrual period (LMP) (60%) or bimanual examination (51%). If LMP and ultrasound findings were discrepant, 75% of providers used ultrasound as their preferred measure.

Cervical preparation increased with GA, with misoprostol being the most frequently used method (**Figure 2**). At 12 weeks' gestation, more physicians used cervical preparation in nulliparous women compared with multiparous women (77% vs 59%, *P*≤.01). Community-based clinics used significantly less cervical preparation compared with hospital-affiliated facilities (*P*<.01, **Table 3**). Only 10% of facilities offered surgical abortions at 4 weeks' gestation or less.

Surgical techniques

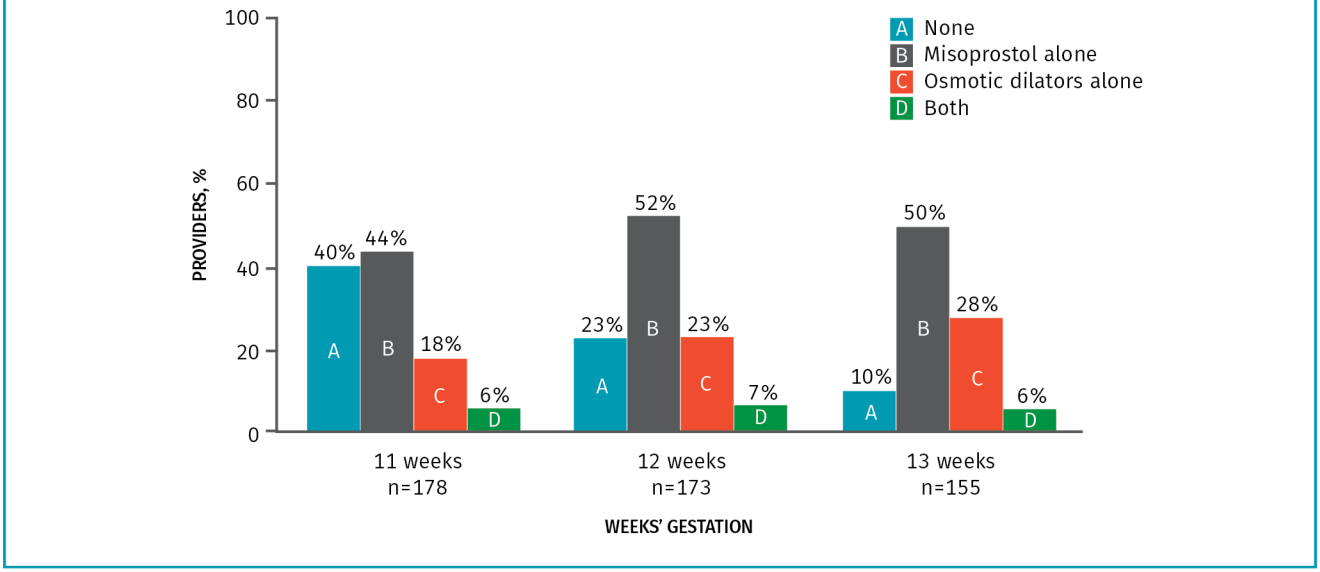
Almost half the physicians (48%) reported using manual vacuum aspiration (MVA), with more FPs than obstetrician-gynecologists using the technique (<6 weeks' gestation, 37% vs 17%, *P*=.008; 6 to 7 weeks' gestation, 44% vs 22%, *P*=.004). The use of MVA decreased as GA increased; less than 35% of physicians used MVA beyond 9 weeks after the LMP.

Medications and anesthesia

The most frequently used perioperative analgesic was nonsteroidal anti-inflammatory drugs (NSAIDs; **Table 4**). Perioperative antibiotics were routinely used by 89% of physicians. In the Atlantic provinces, Ontario, and Québec, doxycycline was the most commonly used antibiotic (≥89%) while in BC and the territories it was metronidazole (87% and 57%, respectively; *P*<.01).

The primary choice of anesthesia reported by facilities was local anesthesia combined with intravenous moderate sedation; nearly half of facilities (46%) used this combination exclusively, and another quarter (27%) used it most of the time. Five facilities (7%) used deep sedation or general anesthesia exclusively. Twenty-nine percent of hospital-affiliated facilities reported using deep sedation or general anesthesia for more than 50% of their procedures, as opposed to only 3% of community-based facilities (*P*=.004). Most oral analgesics used were NSAIDs (64%), while oral opioids were rarely used (5%).

Figure 2. Method of cervical preparation by gestational age in nulliparous patients: *Multiple responses were allowed.*



Nonpharmacologic comfort measures

Physicians reported using a variety of nonpharmacologic techniques to relieve pain (74%), such as focused breathing (63%) or music (55%).

Intra- and postoperative ultrasound use

Most physicians used intraoperative (60%) and postoperative (70%) ultrasound only as clinically indicated. Routine postoperative use was more common in BC and in the territories (38% and 57%, respectively) in contrast with other regions ($P<.0001$) (**Figure 3**).

Postoperative care

Most clinicians routinely performed an immediate postoperative tissue examination on site (81%). A postabortion visit was routinely required by 51% of providers for early surgical abortions of 6 to 7 weeks' gestation or less, and by 42% regardless of GA.

Discussion

We present the first national report on physician demographic characteristics and clinical practices for first-trimester surgical abortion care in Canada. In 2012 first-trimester abortion services across Canada were performed following best evidence and practice guidelines in most important aspects such as ultrasound use, cervical preparation, use of anesthesia, and postoperative care. Consistent with US data,[19] we found 90% of abortions reported were first-trimester surgical abortions, with the remaining 10% being first-trimester MAs or second-trimester MAs or surgical abortions.[14]

More than half of survey respondents were FPs (59%), consistent with FPs being the primary providers for other reproductive health care in Canada such as contraception and cervical cancer screening. Of interest, similar to the US data that had been collected at the same time by another study team,[20] most respondents were female, while a 2006 review of Ontario billing codes showed that male FPs and general practitioners had a higher number of office-based surgical procedures.[21] Female abortion providers tended to be younger than male abortion providers and to be lower-volume providers compared with their older male counterparts. This finding indicates that the makeup of the population of abortion care providers is shifting from older men who have high-volume practices to younger women who have lower-volume practices. This mirrors changes in medicine in general, with more female than male medical school and family medicine residency graduates now compared with decades ago.[22] Our findings have implications for work force planning, including residency and postresidency training, as either the number of providers or the number of procedures per younger provider will need to increase to pick up the work when older high-volume providers eventually retire.

More than 70% of first-trimester surgical abortions were provided in community-based clinics. Extensive evidence supports similar clinical and safety outcomes in both hospital and outpatient settings.[4,8,23] Nonetheless, the province of New Brunswick continues to limit government provision of abortions exclusively to hospitals, a non–evidence-based policy with the potential to limit access to services for women.[24,25]

Only 10% of facilities offered surgical abortions at 4 weeks' gestation or less, despite the absence of a guideline to delay abortion until a certain GA.[5] Based on new data, the latest guidelines specifically recommend performing surgical abortion as early as possible provided that tissue aspirate is examined and ectopic pregnancy is ruled out.[6,26,27]

Table 3. Cervical preparation practices of first-trimester surgical abortion in 2012 by gestation and parity, by facility type: *N=73 facilities. Percentages may add to more than 100% as multiple answers were allowed.*

CERVICAL PREPARATION PRACTICE	HOSPITAL-AFFILIATED, n (%)	COMMUNITY-BASED, n (%)	*P* VALUE
In nulliparous patients			
11 weeks' gestation			
• No cervical preparation	16 (20)	47 (60)	<.01
• Use misoprostol	46 (56)	24 (31)	<.01
• Use osmotic dilators	24 (29)	6 (8)	<.01
• Use both	6 (7)	4 (5)	.75
12 weeks' gestation			
• No cervical preparation	7 (9)	29 (38)	<.01
• Use misoprostol	48 (59)	36 (47)	.20
• Use osmotic dilators	29 (35)	9 (12)	<.01
• Use both	7 (9)	4 (5)	.54
13 weeks' gestation			
• No cervical preparation	1 (1)	14 (20)	<.01
• Use misoprostol	39 (53)	40 (58)	.62
• Use osmotic dilators	30 (41)	16 (23)	.03
• Use both	6 (8)	4 (6)	.75
In multiparous patients			
11 weeks' gestation			
• No cervical preparation	25 (31)	54 (69)	<.01
• Use misoprostol	40 (49)	17 (22)	<.01
• Use osmotic dilators	22 (27)	6 (8)	<.01
• Use both	5 (6)	3 (4)	.72
12 weeks' gestation			
• No cervical preparation	12 (15)	35 (46)	<.01
• Use misoprostol	45 (55)	34 (45)	.27
• Use osmotic dilators	27 (33)	9 (12)	<.01
• Use both	7 (9)	3 (4)	.33
13 weeks' gestation			
• No cervical preparation	4 (6)	19 (28)	<.01
• Use misoprostol	38 (52)	38 (55)	.74
• Use osmotic dilators	29 (40)	14 (20)	.02
• Use both	6 (8)	4 (6)	.75

Table 4. Perioperative routine medication and contraception practices of responding providers of first-trimester surgical abortion in 2012: *N=167 providers. Percentages do not add to 100% as multiple responses were allowed and answers might be missing.*

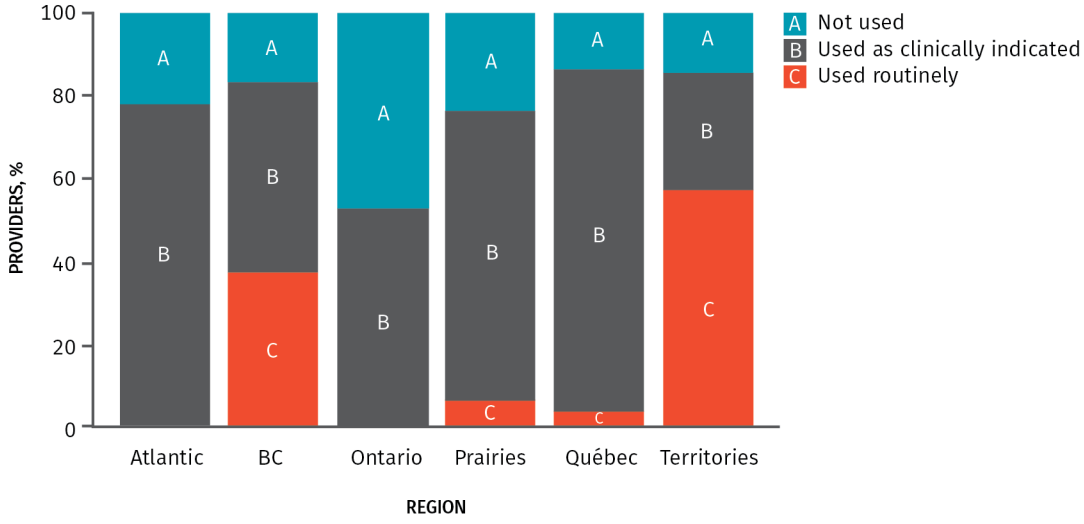
ROUTINE PERIOPERATIVE MEDICATION OFFERED	FREQUENCY, n (%)
Analgesics	
• NSAIDs	106 (67)
• Acetaminophen	12 (8)
• Opioids (eg, hydromorphone, morphine)	8 (5)
• Acetaminophen and codeine or equivalent	3 (2)
Antiemetics	18 (11)
Anxiolytics	
• Lorazepam	59 (37)
• Diazepam	2 (1)
Contraception	
• Levonorgestrel-releasing IUD	158 (96)
• Medroxyprogesterone acetate injection	157 (96)
• Oral contraceptive	149 (90)
• Copper IUD	148 (90)
• Contraceptive patch	141 (86)
• Vaginal ring	134 (82)
Antibiotics (medication)	
• Doxycycline	102 (66)
• Metronidazole	23 (15)
• Azithromycin	11 (7)
• Ciprofloxacin	1 (1)
Antibiotics (duration)	
• Single dose	93 (56)
• 1 preoperative dose and 1 postoperative dose	42 (27)
• 2 or 3 days	1 (1)
• 7 days	4 (3)
• Other	9 (5)

IUD—intrauterine device, NSAID—nonsteroidal anti-inflammatory drug.

While 96% of providers used ultrasound as their primary method to establish GA in the first trimester, guidelines state that ultrasound is not required for dating and should not limit abortion service provision. Clinical history and bimanual pelvic examination are often sufficient to date a first-trimester pregnancy.[4,8,23,26-28] It is important that abortion providers are aware of this dating recommendation as it supports access to abortion care, especially in areas where ultrasound is not readily available. This is particularly important as prior research has demonstrated disparities in abortion access in Canada, with access in most provinces being centred in large urban areas rather than being equally present in rural locations.[14]

Providers reported significant variability in cervical preparation between 11 and 13 weeks' gestation. This reflects the lack of evidence available on when to initiate cervical preparation. Multiple international guidelines that were in place at the time of the survey

Figure 3. Postoperative ultrasound use in first-trimester surgical abortion, by region in 2012: *BC and the territories used postoperative ultrasound significantly more than other regions (Fisher exact test,* P*<.0001).*



BC—British Columbia.

recommended against routine cervical preparation but to consider its use in women at risk of cervical or uterine injury, such as in all adolescents (<17 years), women between 12 and 14 weeks' gestation, and women with cervical anomalies or previous surgery, or for a less experienced surgeon.[4,8,23,29,30] While Canadian providers were more likely to report cervical preparation for nulliparous women than multiparous women, this practice is not supported by evidence.[4,26] Misoprostol was used almost twice as frequently as osmotic dilators. Misoprostol is often preferred due to its ease of administration, shorter time interval to maximum effectiveness, patient preference, and less discomfort.[11,30] The combination of misoprostol and osmotic dilators was rarely used and has shown no benefit for cervical dilation in pregnancies of less than 19 weeks' gestation.[4,26,31]

Only 50% of Canadian abortion providers selectively used MVA as opposed to electric vacuum aspiration. Manual vacuum aspiration has shown equivalent efficacy and safety as electric vacuum aspiration and is less costly.[4,8-10]

Surprisingly and similarly to the US survey results,[11] one-tenth of physicians in Canada did not routinely provide antibiotics, despite strong and consistent guideline recommendations to use them preoperatively.[4,8,32,33]

The majority of procedures were undertaken with intravenous sedation and local anesthesia, which have been found to be effective and safe.[27,34,35] However, 7% of clinics used deep sedation or general anesthesia as the sole method of analgesia, despite guidelines advising against its routine use for these procedures.[4,8] Disadvantages of general anesthesia include increased costs, longer recovery time, and anesthesia-related complications.[4] Consistent with evidence, the mainstay of oral analgesia was NSAIDs; oral opioids have not been shown to decrease abortion-related perioperative pain.[34,36] This is reassuring in the context of the opioid crisis.

Consistent with recommendations, less than half the physicians recommended routine follow-up after the procedure. However, appropriate postprocedure follow-up should be accessible.[4,8,26,27]

Strengths and limitations

The important strength of this survey was our 83% response rate with data from every Canadian region—capturing facilities reporting provision of 81% of all abortions reported by CIHI for 2012.[2] Additionally, techniques were reported by individual physicians who provided more than three-quarters of abortions at these facilities. Our preliminary data informed the recently published updated Canadian surgical abortion guidelines.[26]

Focusing recruitment on known abortion facilities, rather than all abortion providers or facilities, may have led to undersampling of the true population and limited generalizability of our data. This is particularly true for Ontario, where providers reported only 8233 of the 25,400 procedures reported to CIHI.[2]

Our data were collected in 2012, before the mifepristone-misoprostol regimen became available in Canada in 2017.[37] While mifepristone MA has likely changed the work force and practice for first-trimester MA, as well as the proportion of MAs versus surgical abortions, it has had little if any impact on how first-trimester surgical abortion procedures are performed. The updated guidelines for first-trimester surgical abortion did not include substantial changes[26] other than emphasizing the evidence on care aspects we identified

in our study as not being well adhered to, such as antibiotic use. We therefore consider our data still relevant for current practice. These data will be helpful in interpreting work force changes that might have occurred since the mifepristone-misoprostol regimen became available in Canada or with the retirement of older work force participants in our survey, and they are useful for work force planning including policies and programs related to residency training and continuing professional development.

Conclusion

Our survey data provide the first national documentation of first-trimester surgical abortion practices in Canada, demonstrating a high degree of evidence-based practice. Recently updated Canadian guidelines may help standardize first-trimester cervical preparation and increase universal preoperative antibiotic prophylaxis. Improvements could be made with regard to decreasing routine use of general anesthesia and authorizing community-based services in all jurisdictions.

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Contributors

The survey was developed by **Dr Heidi E. Jones** and **Dr Katharine O'Connell White** and was revised for Canadian relevance by **Dr Wendy V. Norman** and **Dr Édith R. Guilbert**. Canadian data were collected by **Drs Norman** and **Guilbert**. Analyses were conducted by **Dr Arianne Y.K. Albert**, **Dr Vivien Hu**, **Dr Xiaoning Guan**, **Dr Regina-Maria Renner**, and **Dr Norman**. The first draft was prepared by **Drs Hu, Renner,** and **Guan**, and all authors contributed to revisions and accepted the final version of the manuscript.

Competing interests

None declared

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