

Surgical Education

Pregnancy among residents enrolled in general surgery: a nationwide survey of attitudes and experiences

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Abstract

BACKGROUND: Medical student interest in general surgery has declined, and the lack of adequate accommodation for pregnancy and parenting during residency training may be a deterrent. We explored resident and program director experiences with these issues in general surgery programs across Canada.

METHODS: Using a web-based tool, residents and program directors from 16 Canadian general surgery programs were surveyed regarding their attitudes toward and experiences with pregnancy during residency.

RESULTS: One hundred seventy-six of 600 residents and 8 of 16 program directors completed the survey (30% and 50% response rate, respectively). Multiple issues pertaining to pregnancy during surgical residency were reported including the lack of adequate policies for maternity/parenting, the major obstacles to breast-feeding, and the increased workload for fellow resident colleagues. All program directors reported the lack of a program-specific maternity/parenting policy.

CONCLUSIONS: General surgery programs lack program-specific maternity/parenting policies. Several issues have been highlighted in this study emphasizing the importance of creating and implementing such a policy.

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“Modern” medical students are giving a greater priority to raising a family during residency,¹ and, as such, program directors are increasingly faced with issues surrounding maternity and parenting. In addition, overall interest in general surgery among medical students has declined recently in both Canada² and the United States,³ and general surgery training programs must strive to address issues that may potentially be acting as deterrents including the lack of adequate policies and accommodations for pregnancy and parenting during training. The lack of maternity policies in surgical programs has been shown to deter female medical students from applying to general surgery.⁴

To date, literature exploring these issues, particularly within a general surgery cohort, has been sparse. A recent literature review evaluating pregnancy in residency showed an increased risk of peripartum adverse events, stress related to the lack of support from fellow trainees and departments, resentment toward pregnant residents because of an increased workload, and inconsistent policies regarding maternity and parenting;⁵ however, only 2 of 27 studies examined a purely surgical cohort. It is unknown how many general surgery programs currently have an explicit maternity/parenting policy. In a nationwide survey of practicing female surgeons in Canada, almost two thirds reported the lack of such a policy during residency or practice.⁶ Even when maternity policies do exist, they are often unclear, confusing, poorly defined, and variable among programs even at the same hospital.⁷

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In Canada, professional residents' associations^{8–12} establish an agreement on behalf of all residents specifying their rights in various matters including maternity and parental leave; however, the uniqueness of a surgical residency demands maternity/parenting policies specific to surgical specialties. Given the overall decline in applicants to general surgery and the increased proportion of female applicants to surgical specialties,¹³ a pilot study was conducted to evaluate the modern attitudes and experiences of general surgery residents in a single Canadian training program.¹⁴ That study identified several issues of interest and areas that required further investigation. It was believed that a nationwide survey would provide a more complete understanding of the attitudes and experiences of modern Canadian surgical residents and that an additional survey of program directors would provide more complete and accurate information on the existence of maternity/parenting policies. We hypothesized that Canadian general surgery programs lack program-specific maternity/parenting policies and that residents are dissatisfied with the situation.

Methods

Study approval was obtained from the University of British Columbia Behavioral Research Ethics Board. We distributed the survey, which was piloted in our previous study,¹⁴ to all residents currently enrolled in the 16 general surgery training programs across Canada. The online tool used to construct and distribute the survey was SurveyMonkey (Seattle, WA), and the survey was completed anonymously. Information pertaining to demographics, experiences, and adverse events during pregnancy and the postpartum period and issues pertaining to maternity/parenting policies were solicited. The questions were constructed so that respondents could select 1 specific answer unless more than 1 response was requested. Some questions used a 5-point Likert scale. There were also some open-ended questions that required the writing of text. An invitation to participate in the study containing a link to the online survey was e-mailed by each of the program assistants to the potential participants followed by a total of 3 reminders. An incentive (iPad 2; Apple, Cupertino, CA) was offered to enhance participation rates. A separate survey was sent to the program directors of each Canadian general surgery training program followed by a total of 3 reminders. This short survey was not piloted in our previous study. It included only 4 questions that asked specifically about the existence of pregnant residents in the program, the existence of program-specific maternity/parenting policies, and whether or not they should be implemented. No incentive was offered to the program directors. The resident and program director surveys were distributed simultaneously.

SPLUS 8.0 for Windows (Insightful Corp, Seattle, WA) was used for descriptive statistical analysis. Continuous variables were expressed as the mean \pm standard deviation

and compared using the Student *t* test. The chi-square or the Fisher exact test was used for the comparison of discrete variables. For all comparisons, a $P < .05$ was considered statistically significant.

Results

The total number of survey respondents from 16 general surgery programs was 176. At the time of survey distribution, the number of residents enrolled in general surgery programs across Canada was 600, leading to a survey response rate of 30%. A small number of incomplete responses were received. Given the anonymous nature of the survey, information on nonrespondents was not available. We received no responses from any residents in 1 program (Table 1). The characteristics of resident respondents are summarized in Table 2.

Experiences of female and male surgical residents

Twenty-three of 103 (22%) female residents had 30 pregnancies during residency; 17 of 30 (57%) of these were successfully carried to term, whereas the rest were voluntarily terminated or resulted in miscarriage. There was a trend toward a higher incidence of peripartum complications among female residents (35%) compared with partners of male residents (19%), but this did not reach statistical significance ($P = .31$). Complications included preterm labor, preeclampsia, placental abruption, babies small for their gestational age, and hypertension (Table 3).

Table 1 Number of resident respondents from each program compared with the number of enrolled residents

Program name	Number of enrolled residents	Number of respondents (%)
University of British Columbia	46	16 (34.7)
University of Alberta	52	14 (26.9)
University of Calgary	31	8 (25.8)
University of Saskatchewan	29	9 (31.0)
University of Manitoba	24	5 (20.8)
McMaster University	40	17 (42.5)
University of Toronto	86	24 (27.9)
University of Western, Ontario	33	16 (48.5)
Queen's University	19	7 (36.8)
University of Ottawa	33	11 (33.3)
McGill University	53	11 (20.7)
Universite Laval	32	9 (28.1)
Universite de Sherbrooke	29	7 (24.1)
Universite de Montreal	42	0 (0)
Memorial University of Newfoundland	20	8 (40.0)
Dalhousie University	31	14 (45.1)
Total	600	176

Table 2 Characteristics of resident respondents

Characteristic	Respondents (n = 176)
Mean age (y)	29.7 ± 3.6
Sex (%)	M = 73 (41.5) F = 103 (58.5)
Current level of training (%)	PGY1 = 48 (27.3) PGY2 = 30 (17.0) PGY3 = 50 (28.4) PGY4 = 29 (16.5) PGY5 = 13 (7.4) PGY6 = 6 (3.4)
Marital status (%)	Single = 67 (38.1) Married = 83 (47.2) Common law = 24 (13.6) Divorced/separated = 2 (1.1)
Number of children (%)	0 = 136 (77.3) 1 = 27 (15.3) 2 = 11 (6.3) 3 = 1 (0.6) ≥4 = 1 (0.6)

M = male; F = female; PGY = postgraduate year.

More than half of the female residents (16/23, 70%) stopped overnight call duties by 35 weeks, and 15 of 23 (65%) stopped daytime clinical duties by 36 weeks to 40 weeks. Based on a 5-point Likert scale, most (15/23, 65%) of these residents reported feeling well supported or supported by attending surgeons during their pregnancy. Only 3 of 23 (13%) reported feeling somewhat not supported. These numbers mirror the level of support received from resident colleagues. Although most of the women (16/23, 70%) reported working as much as when they were not pregnant, 6 of 23 (26%) felt that their pregnancy increased their resident colleagues' workloads. Most (17/23, 74%) of the women believed that their pregnancies did not result in less operative experience than their resident colleagues.

Thirteen (57%) women took at least 6 months to 12 months off after giving birth, but 9 of 23 (39%) were doing either full-time research or graduate studies during that time. Reasons provided for pursuing these activities during maternity leave included not losing time from training, continuing to receive pay, having a more flexible schedule than when on clinical duties, feeling pressure to keep up with colleagues, and remaining intellectually challenged.

All 23 (100%) women breast-fed or were planning to breast-feed their babies, and most felt that their role as a surgical resident did not prevent them from breast-feeding for as long as they would like. However, many felt that there were definite barriers to breast-feeding while at work. These included being too busy, not having a place to pump milk, and feeling unsupported by attending surgeons and resident colleagues. All stated that there was no area in the hospital dedicated to breast-feeding mothers and that having such an area close to the operating rooms would be very helpful. Most also suggested that having another resident temporarily relieve the breast-feeding resident during a long case to go and pump would be a reasonable solution.

Similar to the female residents, male residents generally felt supported by attending surgeons and resident colleagues. Ten male residents took between 1 week and 1 month off after the birth. One male resident took 6 months to 12 months off. Interestingly, 6 of 21 (29%) male residents also pursued research or a graduate degree during their time off after the birth, but the reasons for this are not known.

Table 3 Characteristics of female residents and partners of male residents who became pregnant during residency

Characteristic	Female residents (n = 23)	Male residents (n = 21)	P value
Mean age at own or partner's first pregnancy (y)	30.6 ± 1.8	30.2 ± 3.1	NS
Number of pregnancies			NS
1	17	18	
2	5	4	
3	1	0	
≥4	0	0	
Number of miscarriages			NS
1	3	3	
2	1	0	
3	0	0	
Number of pregnancies carried to term			NS
0	7	5	
1	15	15	
2	1	1	
3	0	0	
Complications			NS
Hypertension	1	0	
Preeclampsia	1	0	
Preterm labor	2	1	
Placental abruption	1	1	
Placenta previa	0	1	
Small for gestational age	3	1	
Gestational diabetes	0	0	
Time when program director informed (wk)			NA
<12	8	1	
12-20	13	15	
>20	0	3	
Unknown	2	2	
Stopping overnight call duties (wks)		NA	NA
<20	0		
20-30	6		
31-35	10		
36-40	3		
Initiation of labor	2		
Unknown	2		
Stopping daytime clinical (wks) duties		NA	NA
<20	1		
20-30	1		
31-35	1		
36-40	12		
Initiation of labor	5		
Unknown	3		

NS = not significant; NA = not applicable.

Attitudes toward pregnant colleagues

Interestingly, 19% of survey respondents who had experienced working with a pregnant colleague felt that it substantially increased their own workload, usually in the form of increased number of on-call shifts. Respondents felt that increased resident workload could be reasonably addressed with paid clinical associates, clinical fellows, and research residents to cover call, ensuring an adequate number of residents on each team, making the pregnant resident an extra resident instead of the primary one, having attending surgeons pitch in, getting paid operating room assistants, advanced planning from the program level, flexible rotation scheduling so that residents later in their pregnancy are not on heavy clinical rotations, having additional off-service residents on the service, and having the attending surgeon taking call directly with a junior or off-service resident.

Maternity/parenting policy

Most (147/176, 84%) of the survey respondents felt that it would be important to have a maternity/parenting policy specific to surgical programs. Twenty-five of 176 (14%) were not in favor of this. A majority of the respondents (99/175, 57%) were not aware of whether their program had a specific maternity/parenting policy in place. Some of the issues that residents felt should be included in such a policy were those pertaining to overnight on-call expectations, clinical expectations, amount of maternity leave time, breast-feeding while at work, residents with pregnant partners (ie, no away rotations when partner is pregnant), flexible rotation schedules, remuneration while on maternity/parenting leave, protocols for when peripartum complications necessitated longer time off, clear identification of the amount of time required to fulfill program requirements if maternity/parenting leave is taken, and the role of resident colleagues in covering for pregnant peers.

We received responses from 8 of 16 program directors (a 50% response rate). None of these programs had a formal, written maternity/parenting policy specific to their surgical program. All program directors were aware of female residents who were currently or previously pregnant. All program directors agreed that a specific policy would be helpful to both pregnant residents and their nonpregnant colleagues; however, there were some concerns with respect to implementing and enforcing a program-specific policy if one was already in place through the provincial resident's association.

Comments

This is the first nationwide survey of surgical residents' attitudes toward and experiences with issues related to pregnancy. As more students enter residency during child-bearing years and more women enter surgical specialties,¹³ it is

inevitable that program directors will increasingly be faced with issues pertaining to pregnancy and parenting, and having a policy specific to surgical residency may help to alleviate confusion and allay problems.

Our data directly support our hypothesis that program-specific maternity/parenting policies do not exist and that general surgery residents are dissatisfied with this, highlighting the need for changes at the residency program level. Surgical residency is unique in that it may be more physically demanding, may require longer hours, may have specific occupational hazards (ie, needlestick injury and exposure to anesthetic vapors), and may not have the same flexibility in scheduling that other residency programs enjoy. A maternity/parenting policy for surgical residents must account for these unique concerns of surgical training and should address the following issues deemed important by resident responders: clinical expectations in the third trimester including on-call duties, flexible rotation scheduling, use of vacation time toward maternity/parenting, and clear delineation of how time off for maternity/parental leave may impact length of training. To the best of our knowledge, there are only 2 studies that reported program-specific maternity/parenting policies in surgical specialties.^{15,16} Davis et al¹⁵ surveyed obstetrics and gynecology program directors in Canada, the United States, and Puerto Rico and found that 80% of these programs had a formal program-specific maternity leave policy in place. Most of these policies clearly outlined the number of weeks that could be taken without affecting the duration of training. Carty et al¹⁶ also reported having a formal written maternity policy that clearly outlined the clinical and call expectations as well as the allowance for time off after birth. In that report, all resident mothers felt they had been treated very fairly, and colleagues of these residents felt that the pregnancies did not negatively affect their workload. Cole et al¹⁷ also reported the beginnings of a policy in an otolaryngology residency that incorporated flexible research "blocks" into the curriculum. This allowed a unique program of study to be designed for each resident while still maintaining the required number of days and months for clinical and research training. These reports suggest that when clear policies and contingency plans are in place, pregnant residents are more satisfied, program requirements are still fulfilled, and resident colleagues are not overburdened should unexpected illness or complications occur. The establishment of a definitive policy may be even more important in Canada because there are no residency work hour restrictions, and residents may need such policies to protect their health as well as the health of their babies.

Although our cohort of female respondents reporting pregnancy during residency was relatively small, it represents 22% of female respondents. This likely underestimates the incidence of pregnancy among female surgery residents given our survey response rate of only 30%. It has been well documented in the literature that female residents have increased rates of complications during pregnancy as

compared with the general population and the wives of male residents,^{18,19} which we also showed in our pilot study.¹⁴ The current study shows the same trend although statistical significance was not reached. In this study, we explored motivations behind the trend reported in our pilot study of female residents pursuing graduate studies and/or research during their maternity leave. Respondents reported not losing time from their training, continuing to receive pay, having a more flexible schedule than when on clinical duties, feeling pressure to keep on par with their colleagues, and remaining intellectually challenged as reasons for pursuing these outside activities during maternity leave. The amount of time one can take without adding to the overall duration of training seemed to be the major concern among these women. A policy precisely addressing this issue may alleviate residents' drive to work in the postpartum period when these new mothers are adjusting to parenthood. Studies have shown that the amount of time taken by female and male residents after the birth of children is variable, ranging from 0 weeks to 52 weeks;^{7,20–22} however, many women reported that they would take more time after the birth if they had the choice,⁷ and women with ≥ 9 weeks' maternity leave were more likely to report satisfaction with their postpartum experiences such as breast-feeding.²³ Fortunately, in our study, most of the female surgical residents were able to breast-feed for at least 6 months, and the majority felt that their role as a surgical resident did not prevent them from breast-feeding as long as they had wanted. However, a key issue was that of having a designated area in the hospital close to the operating rooms that breast-feeding mothers could use. This would be a practical solution for the problem and may motivate these women to continue breast-feeding their infants.

One final point highlighted by our study is that of increased workload for colleagues of pregnant residents. Unfortunately, residency scheduling does not take into account the possibility of pregnancy, let alone unforeseen complications. Because there is no formal mechanism that deals with these occurrences, they are experienced as disruptions that create considerable stress on an already high-pressure system. Certainly, residents who are pregnant hold some responsibility to inform those making the schedule to prevent last-minute scheduling changes. Our study shows that almost 20% of residents felt that having a pregnant colleague increased their own workload. This has been previously reported in the literature,^{5,7,21} and opinions regarding the increased workload of fellow residents are varied. For example, although Sayres et al²¹ found that over 40% of pregnant residents felt hostility from their fellow colleagues, Carty et al¹⁶ reported that residents perceived no negative impact on their own workload during a colleague's pregnancy. It is imperative that contingency plans be present in advance so that they can be put into place quickly if needed. For example, allowing more flexible scheduling of rotations may enable pregnant residents to have lighter rotations toward the end of their pregnancy. Instead of

having other residents cover the call for pregnant colleagues, a hired paid associate could provide necessary coverage; unfortunately, the reality is that very few programs actually hire paid staff to cover call.¹⁵

Our study does have several limitations. First of all, despite our offer of an incentive and several reminders, our resident response rate was only 30%. This may be caused in part by the fact that 3 of the schools surveyed are French speaking, and our survey was administered only in English. Although the national language of Canada is English, one may consider having the option of completing the survey in French. If language is truly a limitation, then our results can only be generalized to English-speaking general surgery residents and not necessarily to the wider cohort of residents. An alternate but unlikely reason for the low response rate could also be the fact that the survey took approximately 10 minutes to 15 minutes to complete, and the time involved may have been too much for some of the residents. This being said, the suboptimal response rate is consistent with the lower response rates observed in Internet-based surveys. This has been postulated to be caused in large part by the lack of face-to-face contact with an interviewer and the impersonal nature of Internet surveys.²⁴ In addition, this may also reflect the busy schedules of these residents and perhaps a lack of interest in the issue. Related to this, it is also possible that those who did respond to the survey were more likely to be interested in the topic, leading to a form of selection bias. We also likely did not capture all episodes of pregnancy and childbirth, and, as such, our numbers are only a crude estimate. Finally, the retrospective nature of our study allows for potential recall bias because these events may have happened several years ago.

In conclusion, our survey of general surgery residents and program directors of Canadian training programs has highlighted several important issues pertaining to pregnancy during residency, particularly regarding the importance of having a maternity/parenting policy in place. Because most Canadian general surgery programs do not have a specific maternity/parenting policy, our next step is to present this information to these programs and make recommendations regarding the essential elements of such a policy. By anticipating that pregnancies will occur and preemptively having policies and contingency plans in place, much confusion and resentment may be avoided, leading to greater satisfaction among pregnant residents, their colleagues, and the program itself. Furthermore, more medical students may be inclined to choose general surgery as a career if appropriate accommodations are made for pregnancy and parenting.

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Supplementary Data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.amjsurg.2012.04.005>.