



A cross-sectional survey study of United States residency program directors' perceptions of parental leave and pregnancy among anesthesiology trainees

Une étude transversale sur les perceptions des directeurs de programmes de résidence aux États-Unis concernant le congé parental et la grossesse chez les résidents en anesthésiologie

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Abstract

Purpose Little is known about program directors' knowledge, attitudes, and beliefs regarding parental leave policies in anesthesiology training. This study sought to understand program director perceptions about the effects of pregnancy and parental leave on resident training, skills, and productivity.

Methods An online 43-question survey was developed to evaluate United States anesthesiology program directors' perceptions of parental leave policies. The survey included questions regarding demographics, anesthesiology program characteristics, parental leave policies, call coverage, and the perceived effects of parental leave on

resident performance. Data were collected by Qualtrics (Qualtrics, Provo, UT, USA).

Results Fifty-six of 145 (39%) anesthesiology program directors completed the survey. Forty-eight of 54 (89%) program directors had a female resident take maternity leave in the past three years. When asked how parental leave affects residents' futures, 24/50 (48%) program directors felt it delayed board certification and 28/50 (56%) thought it affected fellowship opportunities. Program directors were split on their perceived impact of becoming a parent on a trainee's work. Yet, when compared with male trainees, program directors perceived that becoming a parent negatively affected female trainees' timeliness, technical skills, scholarly activities, procedural volume, and standardized test scores and affected training experience of co-residents. Program directors perceived no

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difference in impact on female trainees' dedication to patients and clinical performance.

Conclusions *Program directors perceived that becoming a parent negatively affects the work performance of female but not male trainees. These negative perceptions could impact evaluations and future plans of female residents.*

Résumé

Objectif *On ne sait que peu de choses concernant les connaissances, les attitudes et les croyances des directeurs de programme au sujet des politiques relatives aux congés parentaux dans le cadre de la formation en anesthésiologie. Cette étude visait à comprendre les perceptions des directeurs de programme au sujet des effets de la grossesse et du congé parental sur la formation, les compétences et la productivité des résidents.*

Méthode *Un sondage en ligne comportant 43 questions a été élaboré afin d'évaluer les perceptions des directeurs de programme d'anesthésiologie aux États-Unis à l'égard des politiques en matière de congé parental. Le sondage comprenait des questions sur les données démographiques, les caractéristiques du programme d'anesthésiologie, les politiques relatives au congé parental, la couverture des gardes et les effets perçus du congé parental sur la performance des résidents. Les données ont été recueillies par Qualtrics (Qualtrics, Provo, UT, USA).*

Résultats *Cinquante-six (39 %) des 145 directeurs de programme d'anesthésiologie ont répondu au sondage. Quarante-huit des 54 (89 %) directeurs de programme ont eu une résidente ayant pris un congé maternité au cours des trois dernières années. Lorsqu'on leur a demandé comment le congé parental affectait l'avenir des résidents, 24/50 (48 %) des directeurs de programme estimaient que cela retardait la certification médicale et 28/50 (56 %) pensaient que cela affectait les possibilités de fellowship. Les directeurs de programme étaient divisés quant à la question de l'impact perçu de devenir parent sur le travail d'un résident. Pourtant, par rapport aux résidents de sexe masculin, les directeurs de programme étaient d'avis que le fait de devenir parent affectait négativement les résidentes en matière de ponctualité, de compétences techniques, d'activités académiques, de volume procédural, de résultats aux tests standardisés et de l'expérience de formation de leurs co-résidents. Les directeurs de programme n'ont perçu aucune différence d'impact sur le dévouement des résidentes à l'égard de leurs patients ou sur leur performance clinique.*

Conclusion *Selon les directeurs de programme, le fait de devenir parent a une incidence négative sur la performance professionnelle des résidentes, mais non des résidents. Ces perceptions négatives pourraient avoir une incidence sur les évaluations et les plans futurs des résidentes*

Keywords *residency leadership · parental leave · program director · maternity leave · gender · disparities*

Lengthy medical and residency training during childbearing years provide challenges for female physicians including delays in training completion or board certification.¹ Women comprise half of medical school graduates and almost 34% of anesthesiology residents in the United States (US)²; in Canada, women comprise 55% of medical school graduates³ and 41% of anesthesiology residents.⁴ Medical societies and the American Board of Medical Specialties have recognized that adequate maternity leave is important for women in medicine, including trainees.^{5,6} The health and economic benefits of parental leave include decreased infant mortality, improved maternal and infant health, enhanced parent morale and income, and increased employee productivity and retention.^{7,8}

Parental leave policies vary across specialties and institutions, and trainees in graduate medical education programs may be particularly influenced by specialty boards and by program-specific interpretation of these policies.⁹ Prior studies have surveyed program directors and residents in surgical subspecialties to determine perceptions of leave policies and practicality of policy implementation.^{10–12} Only two studies have surveyed female anesthesiologists on experiences related to childbearing and parental leave.^{1,13}

In the US, the American Board of Anesthesiology (ABA) requires diplomats to complete 36 months of clinical anesthesiology training after a 12-month internship in any specialty that provides specific fundamental clinical medicine experiences as dictated by the ABA, along with successful completion of two written board certification examinations—the BASIC examination, to be taken after 18 months of clinical training that includes the internship year, and the ADVANCED examination, to be taken after a minimum of 30 months of clinical training—and subsequently an oral examination and an Objective Structured Clinical Examination. Prior to 2019, trainees were allowed 60 days of absence from the 36-month-long clinical training period without jeopardizing their qualification to sit for the aforementioned examinations in the specific time frame. A parental leave or a leave due to illness that extends the total absence period beyond 60 days will automatically require the trainee to extend their training period upon return to work, and may disqualify a trainee from completing the examination timeline as prescribed by the ABA.

In 2018, the American Society of Anesthesiologists (ASA) approved a Statement on Personal Leave, which

supported leave for anesthesiologists and trainees in the event of personal or familial illness, birth or adoption of a child, and/or safety or cohesion of the family.¹⁴ Consistent with statements from many other American specialty medical societies, the statement specified that at least six weeks of paid parental leave, separate from vacation or sick time, is recommended and trainees should return to their program without loss of training status. Soon thereafter, the ABA revised its Absence from Training policy in 2019 to allow for trainees to seek board approval for extended absence beyond the historical total 60 working days allowed over three years of training.¹⁵ The new policy allows the ABA to consider requests by the trainee, program director, and chair of the department, for absences of up to 40 additional days away from training for conditions covered by the Family and Medical Leave Act. To our knowledge, anesthesiology program directors' perceptions regarding resident parental leave policies have not been previously studied. Our study sought to survey anesthesiology program directors' perceptions on the effects of parental leave on male and female residents' training, skills, productivity, and well-being, prior to formal revision of this ABA policy.

Methods

This study was reviewed and deemed exempt by the Mayo Clinic Institutional Review Board in Rochester, MN. An online 43-question survey was developed based on a survey used in general surgery and obstetrics and gynecology to evaluate program directors' perceptions of parental leave policies.^{10,12} By author consensus, the original survey was adapted to include questions relevant to anesthesiology residency program directors including ASA policy, ABA policy, and coverage of clinical duties. Further, some questions were rewritten to avoid leading questions that could introduce bias. The survey included questions regarding demographics, program characteristics, program policy about parental leave, coverage of call, and the effects of parental leave on resident performance (for male and female residents). Many answers were formatted as a seven-choice Likert-type scale. The responses "somewhat agree, agree, or strongly agree" were combined together to signify agree and the responses "somewhat disagree, disagree, or strongly disagree" were combined for disagree. Additional free-text responses were also solicited. The term "maternity leave" was defined as childbearing parental leave. The term "paternity or partner leave" was defined as non-childbearing or adoptive parental leave. The adapted study survey (Electronic Supplementary Material (ESM), eFig. 1) was piloted with five academic faculties, one non-faculty, and two non-

medical survey specialists at the authors' institutions. The survey was distributed to 145 program directors of accredited anesthesiology residencies by the Society of Academic Associations of Anesthesiology and Perioperative Medicine via email (14 November 2018) and in newsletter announcements in November and December 2018. Survey recipients were told the purpose of the survey, the length of time to complete the survey, and who the investigators were. There was no payment for participation. Data were collected by Qualtrics (Qualtrics, Provo, UT, USA) between 16 November 2018 and 3 February 2019.

Statistical analysis

We described program information including location, demographics, and policy information overall as number and percentage. Program director demographics and opinions were summarized according to both sex and agreement with the proposed ABA policy statement on parental leave as numbers and percentages. Binary categorical data were analyzed with the Chi square test or, if any expected cell count was less than 5, with Fisher's exact test. Ordinal categorical data were analyzed with the Wilcoxon rank-sum test. Numerical values such as age were collected as ordinal categorical responses and analyzed as ordinal variables. Responses are described using the three-point collapsed scale described previously while statistical tests (*P* values) use the original seven-point scale.

The primary analysis compared perceived parenthood impact on male trainees versus female trainees for each aspect of trainee's work. Paired responses (each director provided a response for both male and female trainees) were compared using Wilcoxon signed-rank tests. As a secondary analysis, we explored whether differences in perceived impact on male *vs* female trainees differed based on the sex of the program director, using a Wilcoxon rank-sum test.

We applied finite population correction to all analyses except Fisher's exact tests to reflect sampling from a maximum population of 145 programs. A *P* value < 0.05 was considered statistically significant. Parenthood impact on trainees covered eight different aspects, analyzed without adjustment for multiple comparisons since a post-hoc adjustment would be very conservative in the presence of expected correlated responses across those aspects of work. All analyses were performed using R version 3.6.2 (R Foundation for Statistical Computing, Vienna, Austria).

Results

Fifty-six out of 145 US program directors (39%) completed the survey. Partially completed surveys were included and the number of respondents for the questions can be found in the tables. Residency program characteristics can be found in Table 1. Demographics of the responding program directors can be found in Table 2. Half (24/48) of the respondents had been in residency leadership for ten years or longer. Most program directors had children and 19/49 (39%) had a child during their residency training. Male program directors were more likely to have become a parent during residency training than female program directors were (14/28 [50%] vs 4/20 [20%]; $P = 0.015$).

Of the responding programs, 48/54 (89%) had a resident take maternity leave in the past three years. The median [interquartile range (IQR)] number of residents who took maternity leave in the last three years was 4 [2–6]. Seventy-one percent of the responding programs reported residents taking maternity leave for five weeks or longer. Thirty-three of 53 programs (62%) had a resident take paternity leave in the past three years. The median [IQR] number of residents who took paternity leave in the last three years was 4 [2–5.5]. Over 90% of programs had an average length of two weeks or less for paternity leave, with 13/52 (25%) programs reporting no paternity leave taken.

Program parental leave policies are described in Table 1. Programs approached the use of the ABA 60 working days away from residency differently. Twenty-five of 55 (45%) allowed residents to borrow days from other years; 19/55 programs (35%) divided the 60 days for each year (i.e., 20 days per year) and residents were not able to borrow from other years. Thirty-one (55%) and 35 (62%) of 56 programs did not have a formal written leave policy separate from the ABA for maternity and paternity leave, respectively.

Twenty-four of 50 (48%) program directors perceived that parental leave had delayed board certification for residents. Furthermore, 28/50 (56%) program directors believed parental leave affected fellowship opportunities. Many program directors (26/49 [53%]) were not aware of the ASA statement on parental leave (Table 2). Of those familiar with the position, only 4/23 (17%) program directors selected “somewhat disagree” and none selected “disagree” or “strongly disagree” in response. Conversely, all but one respondent was aware of the ABA policy that, at the time of the survey, was open for comment (Table 2). Of those who disagree with the proposed ABA policy, 16/32 (50%) selected “strongly disagree”, 7/32 (22%) selected “disagree”, and 9/32 (28%) selected “somewhat disagree” with the proposed ABA changes. Of those who agreed with the ABA policy, 2/14 (14%) selected “strongly agree”, 5/14 (36%) selected

“agree”, and 7/14 (50%) selected “somewhat agree”. The level of agreement of the ABA policy between male and female program directors was similar. Program directors who agreed with the ABA policy were younger, had less time in leadership, and had reported negative impact of parental leave on well-being, fellowship opportunities, and board certification (Table 3).

When asked about the perceived impact of parenthood on aspects of the trainee’s work, directors perceived more negative than positive impacts for both male and female trainees. Nevertheless, program directors reported that they perceived a greater negative impact on timeliness, technical skills, scholarly activities, procedural volume, standardized test scores, and affected training experience of other residents for female trainees than for male trainees (Table 4). Nevertheless, directors perceived a similar impact of parenthood on dedication to patient care and clinical performance for female and male residents. eTable 1 (ESM) provides the results of a post-hoc analysis that evaluated how the sex of program directors was associated with disparate perceived impacts of parenthood on female and male trainees. With respect to perceived impact on scholarly activities, female directors more often suggested greater negative impact on female trainees compared with male trainees than male directors did ($P = 0.02$). eTable 2 (ESM) summarizes level of agreement with proposed changes to the ABA policy according to the sex of the program director and whether or not the program director had had children during residency. eTable 3 (ESM) provides the results of program directors’ perception of becoming a parent on resident well-being by sex and agreement with proposed ABA policy change.

In the free-response section of the survey, directors discussed the impact of parenthood on work performance of residents and leave policies using free-text responses. The responses can be found as eFig. 2 (ESM).

Discussion

We examined anesthesiology residency program directors’ beliefs about the effects of parental leave on resident training, skills, productivity, and well-being. Most respondents reported having residents utilize parental leave; however, less than half of programs reported a formal program leave policy. Respondents were split on whether parental leave led to extensions in training and delayed board certification. At the time of the survey, the 2019 ABA Absence on Training policy was open for comment; less than one-third of respondents agreed with the proposed changes. Directors who agreed were more likely to report that parental leave had a negative impact on

Table 1 Anesthesiology residency program general information*

Question	Overall (<i>N</i> = 56)
What type of facility is your residency program a part of? (<i>n</i> = 55)	
Academic	50 (91%)
Community	5 (9%)
US region (<i>n</i> = 55)	
East	18 (33%)
Midwest	16 (29%)
West	10 (18%)
Southeast	8 (15%)
South	3 (5%)
Percentage of female residents (as a percentage of total residents; <i>n</i> = 55)	
0–20%	8 (15%)
21–40%	28 (51%)
41–60%	19 (35%)
Percentage of residents (male and female) with children (<i>n</i> = 54)	
0–20%	22 (41%)
21–40%	19 (35%)
41–60%	9 (17%)
61–80%	3 (6%)
81–100%	1 (2%)
How does your program approach the use of the current ABA-approved 12 weeks (60 working days) of total time away from residency? (<i>n</i> = 55)	
Other system of absence allocation:	11 (20%)
Residents may use the 60 days without restriction during CA 1–3 years [†]	25 (45%)
The 60 days are divided by year of training and residents may not borrow from other years [‡]	19 (35%)
Who covers clinical duties for residents in your program who take parental leave? (<i>n</i> = 52)	
Residents alone	15 (29%)
Residents along with others [§]	32 (62%)
Persons other than residents	5 (10%)
Does your program have a formal support program in place for residents who have recently become parents? (<i>n</i> = 55)	
No	46 (84%)
Yes	9 (16%)
To your knowledge, does your department have a written policy (separate from the ABA's or federal/state law) regarding childbearing parental leave, commonly referred to as "maternity leave"?	
No	31 (55%)
Yes	25 (45%)
To your knowledge, does your department have a written policy (separate from the ABA's or federal/state law) regarding non-childbearing or adoptive parental leave, commonly referred to as "paternity leave" or "partner" leave?	
No	35 (62%)
Yes	21 (38%)
Have you had a resident take maternity leave in the last 3 years? (<i>n</i> = 54)	
No	6 (11%)
Yes	48 (89%)
Have you had a resident take paternity leave in the last 3 years? (<i>n</i> = 53)	
No	20 (38%)
Yes	33 (62%)
Based on your observations, what is the average length of maternity leave taken by residents in your program? (<i>n</i> = 52)	
≤ 2 weeks	4 (8%)
3–4 weeks	11 (21%)

Table 1 continued

Question	Overall (<i>N</i> = 56)
5–6 weeks	15 (29%)
7–8 weeks	9 (17%)
9–12 weeks	13 (25%)
Based on your observations, what is the average length of paternity or partner leave taken by residents in your program? (<i>n</i> = 52)	
No paternity leave taken	13 (25%)
≤ 1 week	19 (37%)
2 weeks	16 (31%)
3–5 weeks	3 (6%)
6–9 weeks	1 (2%)

*Responses to questions about general program information are summarized as number (percentage). When less than the total number of respondents provided an answer to a given question, the number responding is presented.

† Residents can borrow days from other years

‡ 20 days/year

§ Others include fellows, attendings, certified registered nurse anesthetists, anesthesiologist assistants, or moonlighters

|| When available, all respondents indicated these services were available for both men and women.

ABA = American Board of Anesthesiology.

well-being, fellowship opportunities, and board certification.

Evidence shows that paid parental leave is associated with improvements in postpartum maternal health.⁷ Paid leave decreases postpartum depression and intimate partner violence.⁸ Infants born to mothers with paid leave are more likely to be vaccinated and be breastfed for at least six months and are less likely to be hospitalized for serious illness.¹⁶ In low- to middle-income countries, significant reductions in perinatal, neonatal, infant, and even child mortality have been observed.¹⁷

As a result of these benefits, the American Academy of Pediatrics issued a policy statement advocating for twelve weeks of paid leave for all American workers.¹⁸ A survey of 844 practicing physician mothers across 19 specialties found the mean length of maternity leave was eight weeks and only half had paid maternity leave offered by their employer.¹⁹ Policies for parental leave during residency are inconsistent and often nonexistent. Of the 24 members of the American Board of Medical Specialties, 22 have a policy regarding trainee leave, but only 11 are specific to parental leave with significant institutional variation.²⁰ The lack of a standard parental leave policy results in wide variation in leave practice between programs and specialties leaving many residents to combine various forms of leave including vacation, sick, and elective time.²¹

Recently, there has been interest in residency program directors' knowledge and application of parental leave policies. A survey of 163 obstetrics and gynecology

program directors found most residency programs were not aligned with recommendations for paid parental leave, and directors believed becoming a parent negatively affected resident performance and well-being.¹² A survey of 66 general surgery residency program directors found a lack of uniformity in parental leave policies, and directors believed parenthood affected training and well-being of women more than men.¹⁰ A similar study of 45 orthopedic surgery residency programs found that most programs reported having a maternity leave policy, but that it was often unwritten; an average of four weeks maternity leave was available, but most programs (61%) reported it had never been utilized.¹¹

In a survey of 5,782 women physicians of all major specialties, anesthesiology (*n* = 187 [3%]) had the highest odds of experiencing maternal discrimination (88/187 [47%]), defined as self-reported discrimination based on pregnancy, maternity leave, or breastfeeding, and maternal discrimination was associated with a higher odds of self-reported burnout.²² In a recent study, women anesthesiologists who altered the desired timing or number of children were more likely to counsel against a career in anesthesiology because of obstacles related to motherhood.¹³ A perception of autonomy in family planning decisions, regardless of career phase, may be associated with satisfaction with a woman's career in anesthesiology. Significant support and adequate parental leave during training may encourage women to make family planning decisions based on their personal goals.

Table 2 Demographics, parental leave policy agreement, and awareness according to gender sex of program director*

Question	Sex		Total (n= 56)	P value
	Female (n = 20)	Male (n = 28)		
What is your age (in years); n = 48				0.047
30–39	1 (5%)	3 (11%)	4 (8%)	
40–49	7 (35%)	12 (43%)	19 (40%)	
50–59	4 (20%)	10 (36%)	14 (29%)	
60–69	8 (40%)	3 (11%)	11 (23%)	
How many years have you been in residency leadership? (n = 48)				0.36
< 3 years	1 (5%)	2 (7%)	3 (6%)	
3–5 years	5 (25%)	6 (21%)	11 (23%)	
6–9 years	2 (10%)	8 (29%)	10 (21%)	
10 or more years	12 (60%)	12 (43%)	24 (50%)	
Do you have children? (n = 49)				0.22 [†]
No	4 (20%)	2 (7%)	6 (12%)	
Yes	16 (80%)	26 (93%)	43 (88%)	
Did you have or adopt a child during your residency training? (n = 49)				0.02
No	16 (80%)	14 (50%)	30 (61%)	
Yes	4 (20%)	14 (50%)	19 (39%)	
How do you perceive becoming a parent impacts most anesthesiology residents' well-being during training? (n = 50)				0.25
Strong negative impact	2 (10%)	0 (0%)	2 (4%)	
Some negative impact	6 (30%)	9 (32%)	15 (30%)	
Slight negative impact	4 (20%)	5 (18%)	10 (20%)	
No impact	2 (10%)	4 (14%)	6 (12%)	
Slight positive impact	2 (10%)	2 (7%)	4 (8%)	
Some positive impact	4 (20%)	6 (21%)	11 (22%)	
Strong positive impact	0 (0%)	2 (7%)	2 (4%)	
Do you agree or disagree with the following—Parental leave delays board certification for residents (n = 50)				0.90
Strongly disagree	4 (20%)	2 (7%)	6 (12%)	
Disagree	3 (15%)	4 (14%)	7 (14%)	
Somewhat disagree	0 (0%)	5 (18%)	5 (10%)	
Neither agree nor disagree	3 (15%)	5 (18%)	8 (16%)	
Somewhat agree	8 (40%)	9 (32%)	18 (36%)	
Agree	1 (5%)	3 (11%)	5 (10%)	
Strongly agree	1 (5%)	0 (0%)	1 (2%)	
Do you agree or disagree with the following—Parental leave affects fellowship opportunities for residents (n = 50)				0.91
Strongly disagree	3 (15%)	0 (0%)	3 (6%)	
Disagree	3 (15%)	5 (18%)	9 (18%)	
Somewhat disagree	0 (0%)	2 (7%)	2 (4%)	
Neither agree nor disagree	2 (10%)	6 (21%)	8 (16%)	
Somewhat agree	7 (35%)	8 (29%)	16 (32%)	
Agree	1 (5%)	4 (14%)	5 (10%)	
Strongly agree	4 (20%)	3 (11%)	7 (14%)	
Are you aware of the ASA policy statement on parental leave? (n = 49)				0.42
No	12 (60%)	14 (50%)	26 (53%)	
Yes	8 (40%)	14 (50%)	23 (47%)	
Please select the statement that most closely matches your opinion of the ASA statement on parental leave (n = 23)				0.05
Strongly disagree	0 (0%)	0 (0%)	0 (0%)	
Disagree	0 (0%)	0 (0%)	0 (0%)	
Somewhat disagree	3 (38%)	1 (7%)	4 (17%)	

Table 2 continued

Question	Sex		Total (<i>n</i> = 56)	<i>P</i> value
	Female (<i>n</i> = 20)	Male (<i>n</i> = 28)		
Neither agree nor disagree	2 (25%)	4 (29%)	7 (30%)	
Somewhat agree	2 (25%)	4 (29%)	6 (26%)	
Agree	1 (12%)	5 (36%)	6 (26%)	
Strongly agree	0 (0%)	0 (0%)	0 (0%)	
Are you aware of the ABA policy and proposed changes as recently circulated by ABA and currently open for comment? (<i>n</i> = 50)				0.42 [†]
No	1 (5%)	0 (0%)	1 (2%)	
Yes	19 (95%)	28 (100%)	49 (98%)	
Please select the statement that most closely matches your opinion of the proposed changes to the ABA Policy on Absence from Training (<i>n</i> = 48)				0.09
Strongly disagree	9 (47%)	7 (25%)	16 (33%)	
Disagree	3 (16%)	4 (14%)	7 (15%)	
Somewhat disagree	1 (5%)	7 (25%)	9 (19%)	
Neither agree nor disagree	2 (11%)	0 (0%)	2 (4%)	
Somewhat agree	2 (11%)	5 (18%)	7 (15%)	
Agree	1 (5%)	4 (14%)	5 (10%)	
Strongly agree	1 (5%)	1 (4%)	2 (4%)	

*Responses are presented as number (percentage) both according to sex of program director and overall. Eight respondents did not provide sex information and their responses are included for completeness. When less than the total number of respondents provided an answer to a given question, the number responding is presented. *P* values are from comparison of the given question across sex (excluding those who did not report their sex). Unless specified otherwise, yes-no questions are compared using Chi square tests and other questions are compared using rank tests. *P* values were adjusted using a finite population correction to account for the large proportion of the overall population observed.

[†] Fisher's exact test

ABA = American Board of Anesthesiology; ASA = American Society of Anesthesiology.

Since patient care demands continuous presence in the operating room,²³ anesthesiology trainees are especially dependent on their superiors to grant breaks from patient care. It is possible trainees may alter their family plans if they perceive a lack of control over their work environment.²⁴ In a study of women anesthesiologists, one-third altered their desired age of childbearing or number of children because of work demands, and approximately one fifth of them would counsel against a career in anesthesiology because of obstacles pertaining to motherhood.¹³ In a pilot survey of women anesthesiologists who gave birth during training (*n* = 37), the median length of parental leave in training was six weeks and only less than half of respondents felt the length of parental leave was adequate. Furthermore, a majority of respondents extended their training, one-tenth delayed board certification, and less than half felt this put them at a disadvantage when applying for a job, fellowship, or residency.¹ Based on the current study, it appears some program directors share these concerns.

Physician well-being and the ability to respond to familial or personal needs are vital to the health of the

trainee and to the specialty. Some program directors perceived negative impacts on many aspects of trainee work, with negative perceptions more frequently reported for female trainees except for clinical performance and dedication to patient care. Interestingly, the perception of greater impact of parenthood on female resident's work compared with male resident's work was reported by both male and female program directors. Moreover, female program directors were more likely than male program directors to suggest a negative perceived impact on scholarly activities for female residents compared with male residents. This negative perception of female residents taking leave has been found in studies of other specialties. A study of internal medicine residents found that women residents received lower peer evaluation scores following pregnancy than men did.²⁵ Additionally, a study of surgical residents found that they perceived that faculty performed fewer operations with women having been pregnant during residency.²⁶

It is not possible to clarify from our results whether the perception of program directors reflects 1) implicit bias in the perception of the impact of childbearing on female

Table 3 Demographics, policy agreement, and awareness according to agreement with proposed American Board of Anesthesiology absence from training policy change*

Question	Agreement with proposed changes		Total (<i>n</i> = 56)	<i>P</i> value
	No (<i>n</i> = 34)	Yes (<i>n</i> = 14)		
What is your age (in years; <i>n</i> = 48)				0.04
30–39	1 (3%)	3 (21%)	4 (8%)	
40–49	12 (36%)	7 (50%)	19 (40%)	
50–59	13 (39%)	1 (7%)	14 (29%)	
60–69	7 (21%)	3 (21%)	11 (23%)	
How many years have you been in residency leadership? (<i>n</i> = 48)				0.04
< 3 years	2 (6%)	1 (7%)	3 (6%)	
3–5 years	6 (18%)	5 (36%)	11 (23%)	
6–9 years	6 (18%)	4 (29%)	10 (21%)	
10 or more years	19 (58%)	4 (29%)	24 (50%)	
Do you have children? (<i>n</i> = 49)				1.00 [†]
No	4 (12%)	2 (14%)	6 (12%)	
Yes	30 (88%)	12 (86%)	43 (88%)	
Did you have or adopt a child during your residency training? (<i>n</i> = 49)				0.32
No	20 (59%)	10 (71%)	30 (61%)	
Yes	14 (41%)	4 (29%)	19 (39%)	
How do you perceive becoming a parent impacts most anesthesiology residents' well-being during training? (<i>n</i> = 50)				0.04
Strong negative impact	1 (3%)	1 (7%)	2 (4%)	
Some negative impact	8 (24%)	6 (43%)	15 (30%)	
Slight negative impact	7 (21%)	2 (14%)	10 (20%)	
No impact	4 (12%)	2 (14%)	6 (12%)	
Slight positive impact	3 (9%)	1 (7%)	4 (8%)	
Some positive impact	9 (26%)	2 (14%)	11 (22%)	
Strong positive impact	2 (6%)	0 (0%)	2 (4%)	
Do you agree or disagree with the following—Parental leave delays board certification for residents (<i>n</i> = 50)				0.02
Strongly disagree	6 (18%)	0 (0%)	6 (12%)	
Disagree	5 (15%)	2 (14%)	7 (14%)	
Somewhat disagree	4 (12%)	1 (7%)	5 (10%)	
Neither agree nor disagree	5 (15%)	3 (21%)	8 (16%)	
Somewhat agree	13 (38%)	5 (36%)	18 (36%)	
Agree	1 (3%)	2 (14%)	5 (10%)	
Strongly agree	0 (0%)	1 (7%)	1 (2%)	
Do you agree or disagree with the following—Parental leave affects fellowship opportunities for residents (<i>n</i> = 50)				0.02
Strongly disagree	3 (9%)	0 (0%)	3 (6%)	
Disagree	7 (21%)	2 (14%)	9 (18%)	
Somewhat disagree	1 (3%)	1 (7%)	2 (4%)	
Neither agree nor disagree	6 (18%)	1 (7%)	8 (16%)	
Somewhat agree	11 (32%)	4 (29%)	16 (32%)	
Agree	3 (9%)	2 (14%)	5 (10%)	
Strongly agree	3 (9%)	4 (29%)	7 (14%)	
Are you aware of the ASA policy statement on parental leave? (<i>n</i> = 49)				0.23
No	16 (48%)	9 (64%)	26 (53%)	
Yes	17 (52%)	5 (36%)	23 (47%)	
Please select the statement that most closely matches your opinion of the ASA statement on parental leave (<i>n</i> = 23)				0.29
Strongly disagree	0 (0%)	0 (0%)	0 (0%)	
Disagree	0 (0%)	0 (0%)	0 (0%)	

Table 3 continued

Question	Agreement with proposed changes		Total (<i>n</i> = 56)	<i>P</i> value
	No (<i>n</i> = 34)	Yes (<i>n</i> = 14)		
Somewhat disagree	4 (24%)	0 (0%)	4 (17%)	
Neither agree nor disagree	4 (24%)	2 (40%)	7 (30%)	
Somewhat agree	5 (29%)	1 (20%)	6 (26%)	
Agree	4 (24%)	2 (40%)	6 (26%)	
Strongly agree	0 (0%)	0 (0%)	0 (0%)	

*Responses are presented as number (percentage) both according to agreement with proposed changes to ABA leave policy and overall. Agreement was categorized as yes/no where the levels “somewhat agree”, “agree”, and “strongly agree” were classified as yes and other non-missing levels were classified as no. Eight respondents did not provide an answer to the question about proposed changes and their responses are included for completeness. When less than the total number of respondents provided an answer to a given question, the number responding is presented. *P*-values are from comparison of the given question across agreement status. Unless specified otherwise, yes-no questions are compared using Chi square tests and other questions are compared using rank tests. *P*-values were adjusted using a finite population correction to account for the large proportion of the overall population observed.

† Fisher’s exact test

ABA = American Board of Anesthesiology; ASA = American Society of Anesthesiology.

trainees, 2) actual worsened performance of female trainees after childbearing, or 3) whether worsened performance is a result of inadequate and inconsistently applied parental leave and lactation policies. To date, there are no studies of whether longer leaves without extension of training improve or detract from resident performance. Presumably, avoiding extension of training would avoid delays in graduation and commencement of fellowship training. There is some recent evidence that longer leaves are associated with better rates of postpartum depression, burnout, and breastfeeding duration.²⁷ Lack of a formal maternity leave policy was associated with surgical residents considering leaving their residency program.²⁸ It is possible that a standardized parental leave policy, consistently applied, may mitigate this phenomenon.

The current study has other limitations. We surveyed anesthesiology program directors in the US and our results may not be applicable in Canada and other countries with different parental leave policies. We selected a survey instrument that had been previously used in studies in general surgery and obstetrics and gynecology residency programs, with the hypothesis that anesthesiology trainees face similar challenges in family and work life. Nevertheless, questions regarding trainees’ surgical volumes and cases per day are dependent on the operating room schedule and not a reflection on the anesthesiology trainee. A low survey response rate of 38% may reflect nonresponse bias. Additionally, our survey was based upon published surveys and articles in general surgery and obstetrics and gynecology literature which required self-identification by program directors as “male” or “female” (biological terminology), but also included the choice of “another gender identity” (gender-based

terminology). The authors recognize that gender-based terminology would have been preferred. Nevertheless, for consistency and accurate reflection of the questions and elicited answers, we use self-identified biologic sex designations (male/female). Future surveys and, ideally professional guidelines, would limit the conflation of sex and gender language.

Future studies will evaluate the effect of the updated ABA Absence from Training policy, which allows the ABA to consider requests of up to 40 additional days away from training by the trainee, program director, and department chair on individual programs. Residency and fellowship program directors’ opinions about the effects of pregnancy and parental leave on resident skills should also be re-evaluated after policy implementation.

In conclusion, the perceptions of anesthesiology residency program directors were mixed with approximately half perceiving that parental leave delayed board certification and impacted fellowship opportunities for residents. Moreover, the majority of program directors disagreed with the changes made in the 2019 ABA Absence from Training policy, although most had a resident take maternity leave in the last three years. In addition, when compared with male trainees, program directors perceived that parenthood negatively affected many aspects of female trainees’ work. These perceptions could impact evaluations, recommendations, and future plans of female residents taking parental leave during training. It is important to consider how current culture and policies in medicine influence how men and women may experience parenthood.

Table 4 Perceived impact of becoming a parent on a trainee's work by gender*

	Female trainees (n = 48)	Male trainees (n = 48)	P value
Timeliness			0.03
Negative	19 (40%)	13 (27%)	
No impact	26 (54%)	33 (69%)	
Positive	3 (6%)	2 (4%)	
Dedication to patient care			0.35
Negative	7 (15%)	4 (8%)	
No impact	33 (69%)	39 (81%)	
Positive	8 (17%)	5 (10%)	
Clinical performance			0.62
Negative	14 (29%)	8 (17%)	
No impact	31 (65%)	39 (81%)	
Positive	3 (6%)	1 (2%)	
Technical skills			0.02
Negative	6 (12%)	3 (6%)	
No impact	41 (85%)	43 (90%)	
Positive	1 (2%)	2 (4%)	
Scholarly activities (n = 47)			< 0.001
Negative	32 (68%)	19 (40%)	
No impact	14 (30%)	28 (60%)	
Positive	1 (2%)	0 (0%)	
Procedural volume			0.01
Negative	12 (25%)	7 (15%)	
No impact	36 (75%)	41 (85%)	
Positive	0 (0%)	0 (0%)	
Standardized test scores			0.004
Negative	23 (48%)	15 (31%)	
No impact	22 (46%)	31 (65%)	
Positive	3 (6%)	2 (4%)	
Affects training experience of other residents			< 0.001
Negative	25 (52%)	13 (27%)	
No impact	21 (44%)	34 (71%)	
Positive	2 (4%)	1 (2%)	

*For directors who provided sex information, responses assessing impact of becoming a parent are summarized according sex of trainees being considered. Responses of "strong", "some", and "slight" negative impact are classified as "negative", and responses of "strong", "some", and "slight" positive impact are classified as positive. P-values are from paired Wilcoxon signed rank tests and were adjusted using a finite population correction to account for the large proportion of the overall population observed.

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