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REPORTS OF ORIGINAL INVESTIGATIONS

Canadian public perception of anesthesiologists: results from a national survey

Perception des anesthésiologistes par le public canadien : résultats d'un sondage national

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Abstract

Purpose *As Canadian health systems experience greater pressure to deliver timely perioperative care, public opinion is likely to influence health care policy decisions. Since Canadian public perception of anesthesiologists is unknown, the goal of this Canadian-wide survey was to begin to quantify public opinion regarding anesthesiologists in Canada.*

Methods *The Maru/Blue international market research group was contracted to survey the Canadian public on their perceptions of anesthesiologists. The anonymous bilingual polling surveys were presented to consenting Canadians, who earn credits from Maru/Blue that provide financial reward for participation, by means of an online survey tool. Results were weighted by education, age, sex, region, and language to match census data with an estimated margin of error of ± 3.0%, 19 times out of 20.*

Results *In August 2020, 1,511 randomly selected consenting Canadian adults recruited by the Maru/Blue research group in all ten provinces answered five sequential questions with variably presented answers. A total of 812 (54%) respondents identified as female. Most participants were from Ontario (38%) and Quebec (24%). The majority of participants, 778 (52%), were over 55 yr of age, with 496 (33%) having an annual income of between CAD 50,000 and 100,000. Only 41% (624/1,511) of respondents identified the most responsible anesthesia provider as a physician, with the next most frequent response being that the anesthesia provider was unknown (350/1,511; 23%). The median [interquartile range] impression of anesthesiologists was favourable [favourable–somewhat favourable], with 310/1,511 (21%) expressing an unknown impression.*

Conclusions *Over half of surveyed Canadians did not identify the most responsible anesthesia provider as a physician.*

Résumé

Objectif *Alors que les systèmes de santé canadiens subissent une pression accrue pour fournir des soins périopératoires en temps opportun, l'opinion publique est susceptible d'influencer les décisions stratégiques en matière de soins de santé. Comme la perception du public canadien à l'égard des anesthésiologistes est inconnue, l'objectif de cette enquête pancanadienne était de commencer à quantifier l'opinion publique à l'égard des anesthésiologistes au Canada.*

Méthode *Le groupe d'études de marché international Maru/Blue a été mandaté pour sonder le public canadien sur ses perceptions des anesthésiologistes. Les sondages bilingues*

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anonymes ont été présentés à des personnes canadiennes consentantes, qui obtiennent des crédits de Maru/Blue qui offrent une récompense financière pour leur participation, au moyen d'un outil de sondage en ligne. Les résultats ont été pondérés en fonction de l'éducation, l'âge, le sexe, la région et la langue pour apparier les données du recensement avec une marge d'erreur estimative de ± 3,0 %, 19 fois sur 20.

Résultats *En août 2020, 1511 personnes adultes canadiennes consentantes sélectionnées au hasard et recrutées par le groupe de recherche Maru/Blue dans les dix provinces ont répondu à cinq questions séquentielles avec des réponses présentées de façon variable. Au total, 812 des personnes ayant répondu (54 %) se sont identifiées comme des femmes. La plupart des participant·es venaient de l'Ontario (38 %) et du Québec (24 %). La majorité des participant·es, 778 (52 %), avaient plus de 55 ans, et 496 (33 %) avaient un revenu annuel compris entre 50 000 et 100 000 CAD. Seulement 41 % (624/1511) des personnes ayant répondu ont indiqué que le/la prestataire d'anesthésie le/la plus responsable était un·e médecin, la réponse la plus fréquente étant que le/la prestataire d'anesthésie était inconnu·e (350/1511; 23 %). L'impression médiane [écart interquartile] des anesthésiologistes était favorable [favorable - plutôt favorable], 310/1511 (21 %) exprimant une impression inconnue.*

Conclusion *Plus de la moitié des Canadiennes et Canadiens interrogé·es n'ont pas identifié le/la prestataire d'anesthésie le/la plus responsable comme étant un·e médecin.*

Keywords anesthesia providers · anesthesiology · health services research · public opinion · survey research

The COVID-19 pandemic placed unprecedented demands on the health care system.[1] As the system attempts to recover, addressing the surgical backlog is a top priority. Provider shortages are forcing a reassessment of how care is delivered, including the delivery of perioperative care. Multiple impediments to ramping up perioperative services exist, including the ongoing shortage of anesthesiologists. Anesthesia groups will be under pressure to provide intraoperative care regardless of how it impacts their ability to provide services outside of the operating room. The pressure to address the surgical backlog quickly could compel governments and hospital administrators to reimagine how anesthesia care is provided to surgical patients. This reimagining may include use of alternative anesthesia provider models, including anesthesia care teams and/or nurse anesthetists.[2,3]

We believe changes to current care models ideally should be influenced by patient outcomes. Nevertheless, affordability, available staff, and ability to control provider activity have the potential to intrude when nonanesthesiologists undertake changes to care models. Health care experts will certainly provide input but ultimately the decisions will be made by politicians who are influenced by public opinion. In general, Canadian physicians are held in high esteem and are a highly trusted profession.[4] Nonetheless, the public opinion of physicians can change when physician billing practices or obstruction to care are profiled by the media.[5] In the past, these swings have often coincided with contract negotiations when governments have sought to mobilize the court of public opinion to strengthen their bargaining position. Given the significance and likelihood of this practice, we thought it important to understand how anesthesiologists are regarded by the Canadian public.

Methods

The Ottawa Health Sciences Network Research Ethics Board (Ottawa, ON, Canada) determined that research ethics board review was not required per the Tri-Council Policy for this public opinion survey.[6] All participants provided consent to participate in the survey and could discontinue the survey at any time without consequence or penalty. We contracted Maru/Blue (www.marugroup.net/maru-blue; Toronto, ON, Canada), an international market research group, to survey the Canadian population on their perceptions of anesthesiologists. Maru/Blue followed standard processes to ensure the ethical conduct of online surveys that are consistent with privacy policy. Specifically, Maru/Blue was fully compliant with the conduct, transparency, and accountability requirements of the Canadian Research Insights Council, and rigorously abides by the standards of the American Association for Public Opinion Research and the European Society for Opinion and Marketing Research.

Maru/Blue's national omni bilingual polling service surveyed consenting Canadians by means of an anonymous online survey tool. The Maru/Blue distribution list enabled them to generate representative samples of the Canadian population. Maru/Blue was formerly part of the Angus Reid Forum and is a recognized online survey company in Canada.[7] Survey development followed guidelines for survey generation[8] with previous studies of perceptions of anesthesiologists guiding question generation.[9–14] Cost constraints limited the number of questions asked in the survey to five (see specific questions and available responses in Table 1). The survey questions were internally piloted by the authors and their teams with the process being overseen by Maru/Blue data collection experts. Participants earn credits that provide financial reward for completing the surveys. Participants were unaware of who sponsored the

Table 1 Survey questions and responses

1. How recently have you or someone in your immediate family undergone a procedure in the hospital that required being put to sleep (i.e., receiving an anesthetic)?
In the last month
In the last year
In the last 5 years
Longer than 5 years
Never
2. When you are undergoing surgery under general anesthesia ("asleep"), typically the most responsible person who is caring for you is a/an?
Anesthesia technician/therapist
Anesthetic nurse
Surgeon or surgical assistant
Doctor who specializes in anesthesia
I don't know
3. When you undergo surgery under general anesthesia ("asleep"), what training has the individual who is caring for you most received?
As a respiratory therapist with additional training to get a diploma in anesthesia
As a registered nurse who has additional training to be credentialed in anesthesia
As a technician employed by surgeons and directed by the surgeon to give anesthesia for the surgeon's patients
As physicians (doctors) who typically have received over 4 years of training to provide anesthetic care to patients
I don't know
4. Please indicate what type of impression you have of anesthesiologists, the specialist physicians who put you to sleep and wake you up after an operation?
Favourable impression
Somewhat favourable impression
Somewhat unfavourable impression
Unfavourable impression
Don't know enough about them to have a firm impression
5. Have you or any member of your immediate family used the services of a pain management physician, for example, for chronic back pain or following surgery when the pain did not go away? If YES, please indicate what type of impression you had of your pain management physician:
Favourable impression
Somewhat favourable impression
Somewhat unfavourable impression
Unfavourable impression
Don't know enough about them to have a firm impression

survey. Once the target number of responses was received, access was closed. Questions were asked in the same sequence, but the possible answers were presented randomly. Importantly, the fourth question that specifically identified anesthesiologists as specialty physicians who provide general anesthesia for surgery was asked after all questions about identification of anesthesia provider types had been posed. Analysis focused on the perception of, and experience with, anesthesia providers. The perception and experience of patients with pain physicians was reported descriptively only.

Results were weighted by education, age, sex, and region (and in Quebec, language) to match the population, according to census data, to ensure the sample was reflective of the entire adult population of Canada. For comparison purposes, a probability sample of this size that was comprised of full-time employed respondents has an estimated margin of error (which measures sampling variability) of $\pm$ 3.0%, 19 times out of 20. All analyses were conducted using SAS version 9.4 for Windows (SAS Institute Inc., Cary, NC, USA).

Analyses were primarily descriptive across the full sample. Counts and proportions were calculated for each response to each question accounting for survey weights. We also conducted subgroup analyses based on preplanned respondent characteristics, including by self-reported age group, highest level of education, and recency of receipt of anesthesia services by the individual or a family member. These subgroups were chosen as we expected that these factors might be associated with knowledge and perceptions of anesthesia providers, as: 1) surgery is more common in older people; 2) knowledge of professional practice may be greater among those with higher educational attainment; and 3) personal or family receipt of anesthesia services could directly inform knowledge and perception of anesthesia providers. To explore whether substantial differences may have existed between respondent strata and their probability of identifying their anesthesia provider as a physician or having a positive impression, we created a binary variable identifying those who did or did not select a physician as the primary anesthesia provider, and another identifying those who viewed specialist physician providers somewhat favourably or favourably. We then used logistic regression to estimate the odds that different strata (as categorical variables) were significantly more likely to identify a physician provider, or significantly more likely to view specialist physician providers, somewhat favourably or favourably. A nonmultiplicity adjusted significance level of 5% was used as this was an exploratory analysis.[15] PROC SURVEYLOGISTIC (SAS Institute Inc., Cary, NC, USA) was used to account for survey weights when estimating confidence intervals and stratified analyses, based on time since last general anesthetic, were limited to the 1,308 weighted respondents who had previously had a personal or family experience with anesthesia.

Table 2 Respondent characteristics

		Weighted respondents N = 1,511 (n/total N)	%
Sex	Male	739/1,511	49%
	Female	772/1,511	51%
Age (yr)	18–34	423/1,511	28%
	35–54	524/1,511	25%
	≥ 55	564/1,511	37%
Annual income (CAD)	< 50 K	485/1,511	32%
	50–99 K	502/1,511	33%
	≥ 100 K	296/1,511	20%
	No response	228/1,511	15%
Education	High school	625/1,511	41%
	College	477/1,511	32%
	University	409/1,511	27%
Language	English	1,205/1,511	80%
	French	306/1,511	20%
Personal experience with general anesthesia	Last month	91/1,511	6%
	Last year	195/1,511	13%
	Last 5 years	449/1,511	30%
	Over 5 years	573/1,511	38%
	Never	203/1,511	13%
Region	NS & NL	69/1,511	5%
	PE & NB	42/1,511	3%
	QC	362/1,511	24%
	ON	569/1,511	38%
	MB	53/1,511	4%
	SK	47/1,511	3%
	AB	169/1,511	11%
	BC	197/1,511	13%
	Territories	2/1,511	< 1%

Respondent numbers (n/total N [%]) reflect weighted data

Canada's territories are the Northwest Territories, Nunavut, and the Yukon

AB = Alberta; BC = British Columbia; MB = Manitoba; NB = New Brunswick; NL = Newfoundland and Labrador; NS = Nova Scotia; ON = Ontario; PE = Prince Edward Island; QC = Quebec; SK = Saskatchewan

Results

From 7 to 9 August 2020, Maru/Blue presented five questions (Table 1) to 1,511 randomly selected Canadian adult online panellists in all ten provinces in English and French. Of the 1,511 respondents, 54% (812) identified as female, with the highest percentage of participants being from Ontario (558, 38%) and Quebec (309, 24%). The majority of participants were over 55 yr of age (778, 52%), with 33% (496) having an annual income of between CAD 50,000 and CAD 99,000 (Table 2).

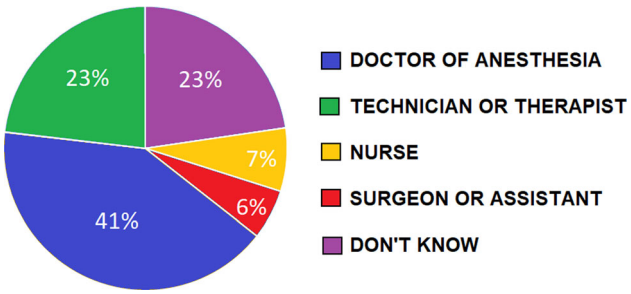

Fig. 1 Graphical representation of how surveyed Canadians identified their anesthesia provider. Shown is the breakdown of how Canadians identified the most responsible anesthesia provider (MRAP)

Anesthesia provider questions

Figure 1 provides representation of the proportion of respondents who identified each of the possible most responsible anesthesia provider (MRAP) categories. Only 41% (624) of all respondents identified the MRAP as a physician. The next most frequent response was that the anesthesia provider was unknown (350, 23%). Figures 2a–c provide responses stratified by respondent characteristics. Only among individuals over age 55 did most respondents identify a physician as the MRAP (51%). Table 3 provides the results of exploratory analyses of associations between respondent characteristics. Only an age of 55 or older was associated with identifying the MRAP as an MD at the 5% level of significance; recent personal experience with general anesthesia was not associated with identification of the MRAP as a physician.

Impression of anesthesia providers

Most (77%; 1,168) individuals reported an impression of the specialist physicians who were responsible for general anesthesia as either "favourable" (53%) or "somewhat favourable" (24%). The median [interquartile range (IQR)] impression of anesthesiologists was favourable [favourable–somewhat favourable], with 310 (21%) expressing an unknown impression.

The impression of specialist anesthesiology physicians did not vary significantly by respondents' education or their recency of experience with general anesthesia (Table 4). Nevertheless, older individuals were more likely to have a somewhat favourable or favourable impression of specialist physicians providing general anesthesia than younger respondents were. Among individuals who had surgery within the last month, 90% (82) reported favourable or somewhat favourable impressions.

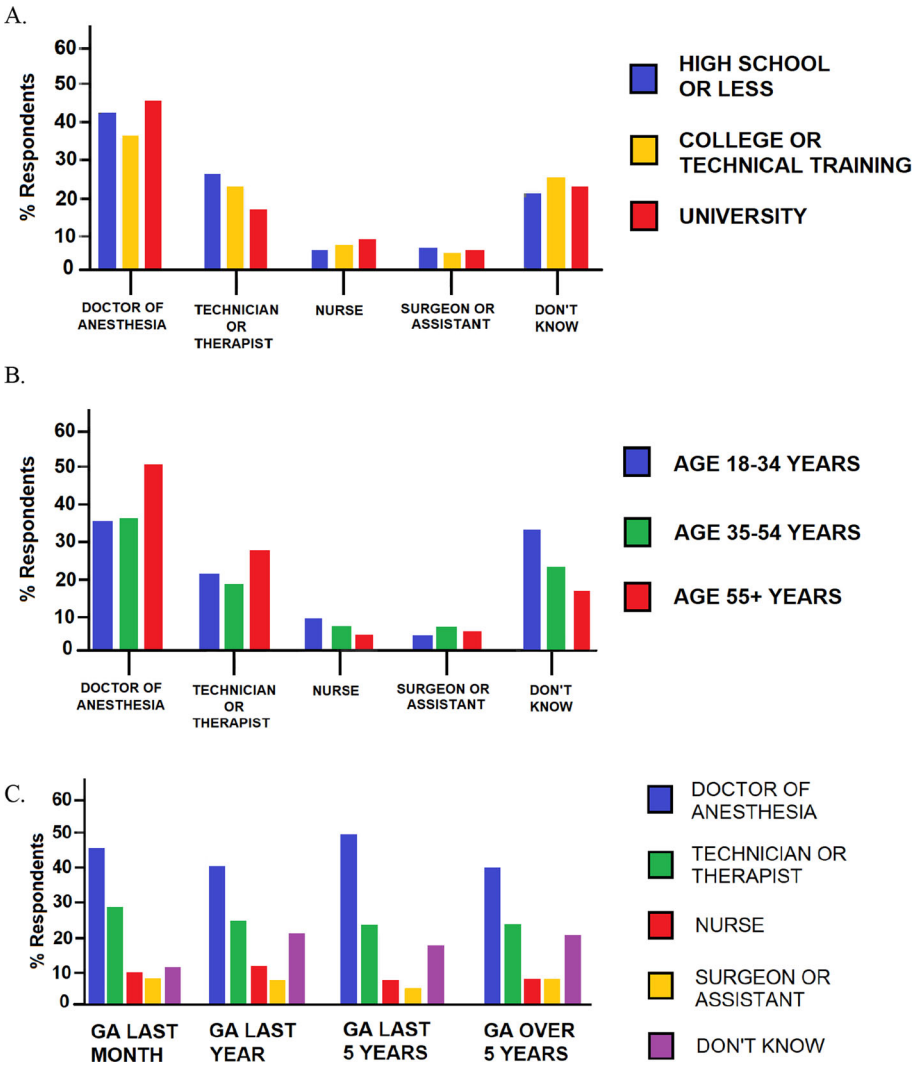

Fig. 2 Identification of anesthesia provider by education, age, and proximity to surgery. Shown is the breakdown of how Canadians identified the most responsible anesthesia provider (MRAP) based on education, age, and time of last surgery, respectively

Impressions of pain physicians

One hundred and ninety-three (13%) respondents reported personal or family experience with a pain physician. Among these 193 respondents, the median [IQR] response was a somewhat favourable [favourable–somewhat unfavourable] impression of pain physicians. Overall, 132 (69%) provided a somewhat favourable or favourable rating of pain physicians.

Discussion

The findings of this cross-Canada survey are concerning on a number of fronts. The fact that more than 50% of respondents did not identify the individual providing a general anesthetic for a surgical procedure as a physician requires urgent and immediate consideration by the Canadian anesthesiology community. The fact that the subgroup of individuals who had previously undergone anesthesia (regardless of when) were no more likely to identify anesthesia providers as physicians suggests that our findings are not due to a lack of contact with anesthesia care. In fact, across Canada almost a quarter of respondents believed the person providing their anesthetic was a technician. The fact that all regions have similar results suggest the perception of anesthesiologists is a systemic, as opposed to a local or regional, issue.

While individuals over age 55 were slightly more likely to identify anesthesia providers as physicians, the proportion of correct respondents in this older age bracket was only 51%. Perhaps the most surprising and concerning finding is that the education level of participants did not impact their knowledge of the training of the person providing them a general anesthetic. Together, these findings suggest a broad-based lack of knowledge about the specialty of anesthesiology

Table 3 Exploratory associations between respondent characteristics and identifying the most responsible anesthesia provider as a physician

Is your anesthesia provider a physician?				
	Yes	No	Odds ratio	95% CI
Age (yr)				
18–34	150/423 (35%)	274/423 (65%)	Reference	-
35–54	188/524 (36%)	336/524 (64%)	1.03	0.70 to 1.51
≥ 55	286/564 (51%)	278/564 (49%)	1.88	1.31 to 2.70
Education				
High school	266/625 (43%)	359/625 (57%)	Reference	-
College	171/477 (36%)	306/477 (64%)	0.75	0.56 to 1.01
University	187/409 (46%)	222/409 (54%)	1.13	0.83 to 1.54
Time since last general anesthesia*				
1 month	42/91 (46%)	49/91 (54%)	Reference	-
1 year	78/195 (40%)	117/195 (60%)	0.78	0.42 to 1.46
5 years	223/449 (50%)	226/449 (50%)	1.15	0.64 to 2.04
> 5 years	228/573 (40%)	345/573 (60%)	0.77	0.43 to 1.36

Respondent numbers (*n*/total *N* [%]) reflect weighted data

*Includes only the 1,308 respondents who had experience with general anesthesia

CI = confidence interval

Table 4 Exploratory associations between respondent characteristics and having a somewhat favourable or favourable impression of specialist physicians who put people to sleep for surgery

Is your impression of specialist physicians who put people to sleep for surgery somewhat favourable or favourable?				
	Yes	No	Odds ratio	95% CI
Age (yr)				
18–34	284/423 (67%)	140/423 (33%)	Reference	-
35–54	393/524 (75%)	131/524 (25%)	1.48	0.99 to 2.23
> 55	489/564 (87%)	75/564 (13%)	3.2	2.13 to 4.82
Education				
High school	478/625 (77%)	147/625 (23%)	Reference	-
College	374/477 (78%)	103/477 (22%)	1.11	0.75 to 1.64
University	314/409 (77%)	95/409 (23%)	1.01	0.96 to 1.47
Time since last general anesthesia*				
1 month	82/91 (90%)	9/91 (10%)	Reference	-
1 year	156/195 (80%)	39/195 (20%)	0.46	0.15 to 1.38
5 years	386/449 (86%)	63/449 (14%)	0.69	0.24 to 1.97
> 5 years	453/573 (79%)	120/573 (21%)	0.43	0.15 to 1.21

Respondent numbers (*n*/total *N* [%]) reflect weighted data

*Includes only the 1,308 respondents who had experience with general anesthesia

CI = confidence interval

and the training and specialization required to provide and facilitate safe and effective perioperative care.

On the other hand, although most respondents did not identify their anesthesia providers as physicians, their perception of those providing anesthesia care was positive. In fact, more than half of respondents expressed a favourable impression of anesthesia providers, and more than 75% had a somewhat favourable impression or higher. Only 3% of individuals reported an unfavourable impression. Therefore, future efforts to improve

knowledge of anesthesiologists can be built on a foundation of favourable impressions of the perioperative care provided in Canada.

The survey findings do have limitations. Respondents included only individuals who participate in online surveys. Despite weighting, their views may not reflect those of all Canadians. Data collection was limited to several days in August which may have biased the results. The timing may also have contributed a COVID-19 "halo" effect give the general goodwill of the public towards health care professionals at that time. If that is the case, then the respondents' perception of anesthesiologists may be less favourable than what the results suggest.

The reason the survey results were weighted was to ensure the results provide a closer approximation of the opinions of the general population. Ideally, respondents to a survey would be fully random but still representative subset of the population. In reality, few public opinion and other types of survey research have perfect representation thus requiring them to "weight" their results to provide a closer approximation to the opinions of the general population. In practice, all statistical estimates accounted for survey weights so that estimates and confidence intervals reflect the general population, and not just the subset of Canadians who responded to the survey.

The results of our survey are similar to those reported in other countries.[9–13] Overall, there appears to be a poor understanding of the specialty of anesthesiology.[12,13] Reports indicate that a considerable portion of the public believe anesthesiologists are not physicians.[12,13] Although variation exists, it would suggest there are systemic factors that impact the public's perception of anesthesiologists and their understanding of the specialty.[11,14] Unlike most surgical, internal, or family medicine specialties, who have one-to-one and ongoing contact and therefore the opportunity to develop relationships with patients, anesthesiologists' primary contact with patients is transient in nature. Anesthesiologists also do not benefit from having special interest groups, like the Canadian Cancer Society, advocating for the specialty or the medical care they provide. This means that, as a specialty, building on existing positive perceptions of anesthesia providers, we must provide outreach and education to our patients and the public about the key role physician anesthesiologists play in providing safe and effective care in perioperative, critical care, and pain medicine. Each point of patient contact, regardless of how transient, provides anesthesiologists the opportunity to identify as physicians helping patients to navigate some of the most stressful experiences in their lives. Lessons learned from public outreach programs, such as *Beyond the Mask* in Ontario,[A] should also prove valuable.

While a full strategic plan to enhance public knowledge and perceptions of our specialty is beyond the scope of this report, a concerted effort by the specialty, including a willingness to engage the public in different venues, is indicated. The good news is that there is lots off which to build. Anesthesiologists have taken major leadership roles: in Canada, as president of the Canadian Medical Association (Dr. Alika Lafontaine); in the USA, as Surgeon General (Dr. Jerome Adams) and as president of the American Medical Association (Dr. Jesse Ehrenfeld). Italian anesthesiologist, Dr. Francisco Menchise, has graced the cover of Time Magazine as a hero on the frontlines of the COVID-19 pandemic.[B] The efforts of some provinces to delist anesthetic services, such as for colonoscopy, led to a social media backlash in support of anesthesia care. Canadian anesthesiologists can also learn from the activities and efforts of the American Society of Anesthesiologists including their advocacy for the importance of "physician-led anesthesia" and their annual Physician Anesthesiologist Week.[16,17] At a time of upheaval in health care delivery in Canada, anesthesiologists cannot hide on the sidelines, but must build relationships, individually with patients and collectively with patient groups, while engaging actively in public discourse about new care models.

Changes in the delivery of health care are inevitable. These changes will certainly be challenging and contentious, requiring the input of all parties including physicians and the public. Anesthesiologists with their diverse knowledge of the health care system are uniquely qualified to provide valuable insights on improving the delivery of health care. Their understanding of pain management and critical care, on top of their unequalled knowledge of perioperative medicine, enables anesthesiologists to identify opportunities to improve and transform the existing system while preserving its safety and effectiveness.

For anesthesiologists to contribute solutions and impact the changes, their opinions must be heard and valued by administrators, politicians, and the public. Although our survey focused on the general public, we suspect that politicians, hospital boards and even many administrators have similar perceptions. Our survey results suggest that there are gaps in the public perception of anesthesiologists. We believe this perception is concerning and should be a call to action for our specialty.

[A] *Ontario's Anesthesiologists*: *Beyond the Mask*. Available from URL: http://ontariosanesthesiologists.ca/beyond-the-mask (accessed April 2023).

[B] *Time Magazine: Heroes of the Front Lines*. 20 April 2000 issue. Available from URL: https://twitter.com/TIME/status/1248218552210821120/photo/1 and https://time.com/collection/coronavirus-heroes/5816805/coronavirus-front-line-workers-issue/ (both accessed April 2023).

Author contributions *David Neilipovitz*, *Jane Cooke-Lauder*, *Gregory L. Bryson*, and *Daniel I. McIsaac* contributed to all aspects of this manuscript, including study conception and design; acquisition, analysis, and interpretation of data; and drafting the article.

Disclosures Dr. Neilipovitz is a past Chair of Ontario's Anesthesiologists and a co-lead on Ontario's Anesthesiologists *Beyond the Mask* initiative. Dr. Cooke-Lauder has served as a consultant to Ontario's Anesthesiologists.

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References

1. *Canadian Institute for Health Information.* Impact of COVID-19 on Canada's health care systems. Available from URL: https://www.cihi.ca/en/covid-19-resources/impact-of-covid-19-on-canadas-health-care-systems (accessed February 2023).
2. *Burns ML, Saager L, Cassidy RB, Mentz G, Mashour GA, kheterpal s.* association of anesthesiologist staffing Ratio with Surgical Patient Morbidity and Mortality. JAMA Surg 2022; 157: 807–15. https://doi.org/10.1001/jamasurg.2022.2804
3. *Sun EC, Miller TR, Moshfegh J, Baker LC.* Anesthesia care team composition and surgical outcomes. Anesthesiology 2018; 129: 700–9. https://doi.org/10.1097/aln.0000000000002275
4. *Ipsos.* Doctors are the most trusted profession in Canada and across the world, 2021. Available from URL: https://www.ipsos.com/en-ca/news-polls/doctors-most-trusted-profession-in-canada (accessed February 2023).
5. *Picard A.* The $6.6-million doctor distorts Ontario's pay battle, 2016. Available from URL: https://www.theglobeandmail.com/opinion/the-66-million-doctor-distorts-ontarios-pay-battle/article29754134/ (accessed February 2023).
6. *Government of Canada.* Tri-Council policy statement: ethical conduct for research involving humans, 2018. Available from URL: https://ethics.gc.ca/eng/policy-politique_tcps2-eptc2_2018.html (accessed February 2023).
7. *Sridhar S.* Paid survey sites in Canada – list of 12 sites to make FREE money. Available from URL: https://www.personalfinancefreedom.com/top-10-paid-survey-sites-for-canadians-to-make-extra-free-money-2020/ (accessed February 2023).
8. *Burns KEA, Duffett M, Kho ME, et al.* A guide for the design and conduct of self-administered surveys of clinicians. CMAJ 2008; 179: 245–52. https://doi.org/10.1503/cmaj.080372
9. *Hariharan S, Merritt-Charles L, Chen D.* Patient perception of the role of anesthesiologists: a perspective from the Caribbean. J Clin Anesth 2006; 18: 504–9. https://doi.org/10.1016/j.jclinane.2006.03.004
10. *Lee JJ, Lee NH, Park CM, et al.* Public awareness about the specialty of anesthesiology and the role of anesthesiologists: a national survey. Korean J Anesthesiol 2014; 66: 12–7. https://doi.org/10.4097/kjae.2014.66.1.12
11. *Nagrampa D, Bazargan-Hejazi S, Neelakanta G, Mojtahedzadeh M, Law A, Miller M.* A survey of anesthesiologists' role, trust in anesthesiologists, and knowledge and fears about anesthesia among predominantly Hispanic patients from an inner-city county preoperative anesthesia clinic. J Clin Anesth 2015; 27: 97–104. https://doi.org/10.1016/j.jclinane.2014.05.012
12. *Klafta JM, Roizen MF.* Current understanding of patients' attitudes toward and preparation for anesthesia: a review. Anesth Analg 1996; 83: 1314–21. https://doi.org/10.1097/00000539-199612000-00031
13. *de Oliveira KF, Clivatti J, Munechika M, dos Reis Falcão LF.* What do patients know about the work of anesthesiologists? Rev Bras Anestesiol 2011; 61: 720–7. https://doi.org/10.1016/s0034-7094(11)70081-2
14. *Arefayne NR, Getahun AB, Melkie TB, Endalew NS, Nigatu YA.* Patients' knowledge and perception of anesthesia and the anesthetists: cross-sectional study. Ann Med Surg (Lond) 2022; 78: 103740. https://doi.org/10.1016/j.amsu.2022.103740
15. *Althouse AD.* Adjust for multiple comparisons? It's not that simple. Ann Thorac Surg 2016; 101: 1644–5. https://doi.org/10.1016/j.athoracsur.2015.11.024
16. *American Society of Anesthesiologists'.* Policymakers. The importance of physican-led anesthesia care. Available from URL: https://www.asahq.org/madeforthismoment/policymakers/ (accessed February 2023).
17. *ASA Monitor.* Physician Anesthesiologists Week 2023 – join us in advocating for the specialty and protecting physician-led anesthesia care. ASA Monitor 2023; 87: 30. https://doi.org/10.1097/01.ASM.0000911804.47302.37