



Self-reported clinical practice and attitudes about cricoid pressure: an online survey of Canadian Pediatric Anesthesia Society members

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To the Editor,

Gastric regurgitation and subsequent pulmonary aspiration are significant sources of complication and morbidity for patients undergoing general anesthesia.¹ Cricoid pressure (CP) is a traditional technique to prevent aspiration, though its use is controversial.² In a recent

survey study in Australia/New Zealand, 77% of anesthesiologists indicated that they routinely use CP in adult patients, and 71% believed CP has a minimal risk of harm.³ We aimed to characterize Canadian pediatric anesthesiologists' views on CP, their perception of its harms and benefits, and their opinions regarding medicolegal and professional concerns.

We conducted an online survey of Canadian Pediatric Anesthesia Society (CPAS) members. After approval from the University of British Columbia Children's and Women's Research Ethics Board (Vancouver, BC, Canada; H19-03252) and the CPAS committee, the survey was sent via the CPAS newsletter email to approximately 100–120 CPAS members in the summer of 2020 as a public survey link administered using REDCap® software (Vanderbilt University, Nashville, TN, USA).⁴ All responses were collected anonymously with implied consent. The survey was designed using questions from the above-referenced recent Australia/New Zealand survey.³

Our survey was accessed by 58 respondents, with eight excluded for incomplete responses. Most respondents (38/50, 76%) had completed their medical residency in Canada, with the rest from the UK (14%), New Zealand (4%), South Africa (4%), and the USA (2%). Most respondents (74%) had more than ten years of service in pediatric anesthesia.

Only 12/50 (24%) respondents reported routinely using CP before tracheal intubation in patients with an increased risk of gastric regurgitation, with 8/12 indicating it has a minimal risk of harm despite uncertain benefits. While 27/50 (54%) did not believe using CP reduces the risk of gastric regurgitation or pulmonary aspiration, 43/50 (86%) believed CP can result in difficulties or adverse events,

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including a worsened laryngoscopy grade or increased difficulty of intubation (Table).

Most respondents (62%) disagreed with the statement, “the possible medicolegal or professional consequences of omitting cricoid pressure in the event of pulmonary aspiration influences my practice more than my interpretation of the available evidence on the benefits or harms of cricoid pressure.” Finally, 96% of respondents believed that emergency airway management guidelines should recommend clinicians exercise individual judgement for using CP or should discourage or omit any recommendations on its routine use.

This study has several limitations. First, our small sample size limits the generalizability of our results to Canadian pediatric anesthesiologists. Second, most of our respondents practice in British Columbia, Ontario, or Quebec, with no respondents from five Canadian provinces and territories; furthermore, 48/50 (96%) respondents practice in tertiary public hospitals. Pediatric anesthesiologists who are not CPAS members and nonspecialists, including those who manage children only occasionally or in community centres, may have a more

cautious approach to these issues; nonetheless, we hope our results will be informative to this broader group. Finally, because the survey was accessed through a public survey link and responses were anonymous, we cannot guarantee that no participants completed the survey more than once.

Our findings suggest that most Canadian pediatric anesthesiologists in CPAS do not use CP for pediatric patients with an increased risk of gastric regurgitation, and most believe its use is a matter of clinical judgement. This differs from the recent study conducted in Australia/New Zealand,³ where 77% of respondents routinely use CP on adult patients, despite the minimal difference in opinions regarding its safety and efficacy, and a survey finding that 90% of USA pediatric anesthesiologists routinely use CP, 68% of whom believed it reduces the risk of gastric regurgitation and only 33% of whom thought it could result in adverse events.⁵ Although our findings should be interpreted with caution, these differences may reflect risks associated with the different populations, locations of medical residency and practice, and the medicolegal environment, despite these countries sharing similar airway management guidelines. Future research should

Table Canadian pediatric anesthesiologists’ responses on the harms and benefits of cricoid pressure and its relevant medicolegal and professional concerns

	Responses, <i>n</i> /total <i>N</i> (%)
Respondents’ views on the potential benefits and/or harms of CP	
Much more likely to result in adverse conditions or harm than confer benefit	6/50 (12%)
Modestly more likely to result in adverse conditions or harm than confer benefit	19/50 (38%)
Unlikely to be harmful or beneficial	15/50 (30%)
Modestly more likely to confer benefit than result in adverse conditions or harm	9/50 (18%)
Much more likely to confer benefit than result in adverse conditions or harm	1/50 (2%)
Concerns that respondents believed can be increased with CP	
Patient discomfort or distress	16/50 (32%)
Worsened laryngoscopy grade or increased difficulty of intubation	42/50 (84%)
Increased incidence of failed intubation	17/50 (34%)
Exacerbation of cervical spine injury	14/50 (28%)
Esophageal injury or rupture	4/50 (8%)
Laryngotracheal injury	7/50 (14%)
Anterior neck trauma	3/50 (6%)
Increased gastric regurgitation	3/50 (6%)
Increased pulmonary aspiration	0/50 (0%)
Respondents’ opinions on emergency airway management guidelines	
Strongly advocate for the routine use of CP	1/50 (2%)
Encourage the routine use of CP	1/50 (2%)
Recommend that clinicians exercise individual judgement about use of CP	32/50 (64%)
Discourage the routine use of CP	8/50 (16%)
Omit any recommendations on the routine use of CP	8/50 (16%)

CP = cricoid pressure

focus on developing a population-specific body of evidence to inform national and international airway management guidelines regarding the use of CP.

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References

1. Cook TM, Woodall N, Harper J, Benger J. Major complications of airway management in the UK: results of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 2: intensive care and emergency departments. *Br J Anaesth* 2011; 106: 632–42. <https://doi.org/10.1093/bja/aer059>
2. Bhatia N, Bhagat H, Sen I. Cricoid pressure: where do we stand? *J Anaesthesiol Clin Pharmacol* 2014; 30: 3–6. <https://doi.org/10.4103/0970-9185.125683>
3. Mistry R, Frei DR, Badenhorst C, Broadbent J. A survey of self-reported use of cricoid pressure amongst Australian and New Zealand anaesthetists: attitudes and practice. *Anaesth Intensive Care* 2021; 49: 62–9. <https://doi.org/10.1177/0310057x20968841>
4. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform* 2009; 42: 377–81. <https://doi.org/10.1016/j.jbi.2008.08.010>
5. Ahmed Z, Zestos M, Chidiac E, Lerman J. A survey of cricoid pressure use among pediatric anesthesiologists. *Paediatr Anaesth* 2009; 19: 183–7. <https://doi.org/10.1111/j.1460-9592.2008.02822.x>

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