

Pediatric EM

The role of physician assistants in pediatric emergency medicine: the physician's view

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ABSTRACT

Objective: To define the range of clinical conditions Canadian emergency pediatricians consider appropriate for management by physician assistants (PAs) and the degree of autonomy PAs should have in the pediatric emergency department (PED).

Methods: We conducted a cross-sectional, pan-Canadian survey using electronic questionnaire technology: the Active Campaign Survey tool. We targeted PED physicians using the Pediatric Emergency Research Canada (PERC) network database ($N = 297$). Three outcome measures were assessed: demographic information, familiarity with PAs, and PA clinical roles in the PED. The level of PA involvement was assessed for 57 common nonemergent clinical conditions.

Results: Of 297 physicians, 152 completed the survey, for a response rate of 51.2%. None of the 57 clinical categories achieved at least 85% agreement regarding PA management without direct physician involvement. Twenty-four clinical conditions had $\geq 15\%$ agreement that any PA involvement would be inappropriate. For the remaining 33 clinical conditions, more than 85% of respondents felt that PA could appropriately manage but were divided between requiring direct and only indirect physician supervision. Respondents' selection of the number of conditions felt to be appropriate for PA involvement varied between the size of the emergency department (ED) in which they work (larger EDs 87.7–89.1% v. smaller EDs 74.2%) and familiarity with the clinical work of PAs in the ED (90.5–91.5% v. 82.2–84.7%).

Conclusion: This national survey of Canadian PED physicians suggests that they feel PAs could help care for a large number of nonemergent clinical cases coming to the PED, but these clinical encounters would have to be directly supervised by a physician.

RÉSUMÉ

Objectifs: L'étude visait à définir une série de troubles cliniques qui, de l'avis des pédiatres urgentologues au Canada, pourraient être convenablement pris en charge par les auxiliaires

médicaux (AM) ainsi que le degré d'autonomie que les AM devraient avoir dans les services d'urgence pédiatrique (SUP).

Méthode: Nous avons mené une enquête transversale, pancanadienne, à l'aide d'un questionnaire électronique tiré de l'outil Active Campaign Survey, et nous avons ciblé les médecins travaillant dans les SUP, qui utilisaient la base de données en réseau du Groupe de recherche en urgence pédiatrique du Canada ($n = 297$). Trois critères d'évaluation ont été retenus, soit les données démographiques, la bonne connaissance des AM, et le rôle clinique des AM dans les SUP. Le degré d'intervention des AM a été évalué dans 57 troubles cliniques fréquents, non urgents.

Résultats: Sur 297 médecins, 152 ont rempli le questionnaire, ce qui a donné un taux de réponse de 51.2%. Aucun des 57 troubles cliniques retenus n'a obtenu un taux de convergence d'au moins 85% en ce qui concerne leur prise en charge par les AM sans intervention directe du médecin. Vingt-quatre troubles cliniques ont obtenu un taux de convergence $\geq 15\%$ dans lesquels toute intervention faite par les AM était jugée inappropriée. Quant aux 33 autres troubles cliniques, plus de 85% des répondants étaient d'accord pour dire que les AM pouvaient convenablement les prendre en charge, mais il y avait divergence quant au degré de supervision: directe ou indirecte seulement. Le choix des répondants quant au nombre de troubles cliniques pouvant être convenablement pris en charge par les AM variait selon la taille des services d'urgence (SU) dans lesquels ils travaillaient (gros SU: 87.7–89.1% contre [c.] petits SU: 74.2%) et la connaissance du travail clinique réalisé par les AM dans les SU (90.5–91.5% c. 82.2–84.7%).

Conclusions: D'après cette enquête nationale menée chez des médecins travaillant dans des SUP, les AM pourraient se charger d'un grand nombre de troubles cliniques non urgents, traités dans les SUP, mais leurs interventions cliniques devraient se faire sous la supervision directe des médecins.

Keywords: emergency physicians, physician assistants, physician attitudes

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Emergency department (ED) overcrowding is a growing concern faced by most hospitals in Canada: two-thirds of Canadian ED directors surveyed identified overcrowding in their ED as a severe problem.¹ The most frequently mentioned determinant of overcrowding in EDs was the proportion of admitted patients occupying an ED bed.² However, pediatric emergency departments (PEDs) face a different challenge in that the volume and level of acuity seen in PEDs include a higher proportion of nonemergent and low-complexity cases, which results in waiting room overcrowding. Attempts at addressing input factors and reducing PED use through gatekeeping, by primary care provider screening prior to PED admission, education, and improved access to primary care services, have been met with conflicting results.³⁻⁶ A systematic review suggests that the use of PAs may alleviate some of the issues regarding wait times in the ED, although with yet unclear cost efficiency.⁷ The growing use of PAs in North America also suggests that these health professionals are providing services that can significantly augment medical care, allowing physicians to focus on the patients in greatest need.

The Canadian experience with PAs since the mid-1980s and their use primarily in the armed forces both domestically and internationally have enhanced their attractiveness in many provinces.⁸ Their scope of practice includes complete patient assessment, initiation of clinical investigations, and patient treatment under the supervision of a physician. Using PAs to assist in managing nonemergent, low-complexity cases may have meaningful benefits in reducing PED waiting room overcrowding by allowing children with lower acuity to be seen in a more timely fashion so that emergency pediatricians can focus on more severely affected children. Indeed, the use of PAs in the ED is common in the United States, where it has been shown to result in high patient satisfaction⁹⁻¹¹ and to be generally accepted by other health care providers.

To ensure safe and standard use of PAs in the ED, the American College of Emergency Physicians developed guidelines on the role division and scope of practice of PAs in general EDs.¹² However, no such guideline exists for PEDs, either in the United States or Canada. Despite the fact that PAs have been providing care for children in EDs in the United States for many years, a systematic review of PAs in EDs⁷ found no articles specifically defining the role of

PAs in a PED or estimating the proportion of ED patient volume they would be able to manage.

We previously demonstrated that a large proportion of visits to a tertiary care centre PED for relatively low-acuity or -complexity clinical conditions, requiring limited medical treatment (low admission rates and more time spent waiting than receiving care), may be amenable to management by PAs.¹³ Over 85% of surveyed physicians and PAs agreed that PAs could contribute to the care of over half of the presented conditions, which collectively were responsible for approximately three-quarters of all PED visits. Due to the small sample size and anticipated practice variation in Canada, this degree of physician acceptability of PAs needs to be validated with a larger survey including physicians from a wider range of PED centres in Canada.

METHODS

Design and sampling approach

Target population

The target population consisted of physicians practicing pediatric emergency medicine in Canada, potential supervisors of PAs in PEDs.

Survey population

All physicians registered in the Pediatric Emergency Research Canada (PERC) network database. This database is maintained for academic purposes under the direction of the PERC executive committee. It comprises contacts for 297 physicians, capturing approximately 70% of physicians routinely practicing pediatric emergency medicine in Canada.

Design

We conducted a cross-sectional survey using electronic questionnaires from the Active Campaign Survey tool. The survey was previously developed through a review of an administrative database of a tertiary care centre PED and a focused group discussion among PED physicians and PAs. The survey was subsequently piloted among a group of our PAs and PED physicians.¹³

Measures

We collected three types of information: demographics, familiarity with PAs, and PA clinical roles in PED determination. Demographic information

included age, the number of years practicing pediatric emergency medicine, the size of the practice centre (average annual visits), and the method of remuneration (fee-for-service billing, salaried, or on service contract and paid by the shift or by the hour). Familiarity with PAs included previous work experience with PAs or knowledge of PAs without having worked with them. Respondents were asked what degree of PA involvement they felt appropriate for each clinical presentation with which they were presented. The three response options for degree of PA involvement were 1) none, 2) PA management with direct physician supervision and involvement, and 3) PA management with indirect (e.g., chart review and cosigning) physician supervision only.

A preliminary review of all visits to a tertiary care PED identified 57 commonly treated, nonemergent clinical conditions, triaged as pediatric Canadian Triage and Acuity Scale (CTAS) 3, 4, or 5, which could be managed by a PA.¹³ Due to the large number of clinical conditions to assess and concerns about survey length, these 57 clinical conditions were randomly divided into two sets of 28 and 29 conditions, and each respondent was presented with only one of the two sets (chosen at random).

Study procedure

The PERC executive committee approved the study protocol and survey questionnaires. Using a modified Dillman survey methodology,¹⁴ a standardized e-mail was sent to the database registrants informing them of the nature of the study (background, along with a short description of PAs, their training in Canada, and experience in the US health care system), rationale, objectives, and their rights associated with their decision to participate as study subjects or decline.

Within 24 hours, a follow-up e-mail from Active Campaign Survey connected all study subjects to the online questionnaire. A scheduled reminder e-mail was sent only to nonresponders. The survey schedule and reminder were sent 2 weeks, 1 month, 2 months, and 2½ months following the original invitation. Finally, a hard-copy mailout survey was sent 3 months following the initial survey deployment.

Communication with individuals to solicit their participation used standardized e-mails. Although participation status was tracked using unique links, we did not attempt to identify individual participants

for any other reasons, nor will we contact them outside of the original study participation invitation and three reminder e-mails. Once data entry and validation were complete, the unique responder tracking identification was removed to prevent further linkages. This study received ethics approval from the Children's & Women's Health Center (Vancouver, BC) Research Review Committee and the University of British Columbia Behavioural Research Ethics Board. Completion of the survey was taken as the respondent's consent to participate. No financial incentives for survey completion were offered.

Random selection

We used the random number generator function in Microsoft *Excel* to select 150 of the 297 subjects to receive the first set of the clinical conditions. The remaining subjects received the second set.

Analyses

We used descriptive statistics to summarize respondents' demographic information and familiarity with PAs. The proportion of respondents choosing each of the three levels of PA involvement for each of the clinical conditions was reported with 95% confidence intervals (CIs). We defined a priori that 1) clinical conditions with $\geq 15\%$ of respondents selecting no PA involvement would be considered inappropriate for PA management in defining the scope of practice for PAs in the PED and 2) clinical conditions with $\geq 85\%$ of respondents selecting PA management with indirect (e.g., chart review and cosigning) physician supervision only would be considered appropriate for PAs to manage and discharge without direct PED physician contacts. The role of demographic background and familiarity with the PA was explored by presenting the difference (and 95% CI) between the mean proportion of clinical conditions selected as appropriate for PA involvement (with or without direct physician supervision) for each subgroup and the reference subgroup for each demographic variable or level of PA familiarity.

The estimated sample size to find with 95% confidence with a confidence interval of $\pm 10\%$ precision and an a priori setting of 85% of respondents selecting PA management without direct physician involvement, or 15% of respondent selecting no PA

involvement being meaningful, was 49 respondents per clinical condition being evaluated.

RESULTS

A total of 297 physicians were contacted by e-mail and, in some cases, mailed-out surveys, and 152 completed the survey, for a response rate of 51.2%. Demographic information is presented in Table 1. Nine-five percent of respondents were between 30 and 60 years of age, with the greatest number (38%) between 30 and 39 years of age, which is comparable to the age distribution of surveyed population, as provided by the database manager (through personal communication

with PERC database administrator). The number of years of working experience in an ED was fairly evenly distributed between less than 5 years to over 15 years. The majority (86%) of respondents work in a dedicated PED and in centres with over 40,000 visits annually (76%). Only a minority of respondents (22%) are remunerated by fee-for-service billing. Most of the respondents had read about or heard of PAs (92%), but only 38% had worked with PAs (trainees or graduates) in a clinical setting, and a smaller number of respondents had more extensive involvement with PAs. These distributions were similar within each of the two sets of clinical conditions.

The level of PA involvement selected for each clinical category by PED physicians is shown in Table 2. No clinical category had at least 85% of respondents selecting PA management with indirect physician supervision. There were 24 (42%) clinical conditions with $\geq 15\%$ of respondents selecting no PA involvement; thus, they were considered inappropriate for PA management in defining the scope of practice for PAs in the PED. PED physicians were divided between direct and without direct supervision for the remainder of 33 (58%) clinical conditions.

The role of respondents' demographic variables on the proportion of conditions selected for PA involvement is shown in Table 3. ED size (annual visit volume at the working site) and age were related to respondents' selection of the number of conditions felt appropriate for PA involvement. The proportion of cases selected for PA involvement by respondents working in larger EDs was significantly higher than that by their counterparts working in smaller EDs (87.7–89.1% v. 74.2%). Although respondents under 30 years of age seemed more conservative in the number of clinical presentations they selected for PA involvement, the sample size in this category was very small. Years of PED experience and type of ED did not play a significant role in the selection of the number of conditions appropriate for PA involvement.

The role of familiarity with the PA in the proportion of conditions selected as appropriate for PA involvement is shown in Table 4. Having worked with PAs (in training or graduated) during clinical shifts played a significant role in the proportion of conditions selected as appropriate for PA involvement. The proportion of clinical conditions selected as appropriate for PA involvement, separated by which random set of clinical conditions each respondent was assigned was similar:

Table 1. Survey respondents' demographics

Characteristics	n (%)
Age (yr)	
< 30	3 (2.0)
30 to < 40	58 (38.2)
40 to < 50	51 (33.6)
50 to < 60	35 (23.0)
60 and higher	5 (3.3)
PEM working experience (yr)	
< 5	32 (21.0)
5 to < 10	46 (30.3)
10 to < 15	34 (22.4)
15 and higher	40 (26.3)
Type of ED	
Dedicated pediatric ED	130 (86.1)
General ED	5 (3.3)
Both	16 (10.6)
Average ED annual volume (no. of visits/yr)	
< 20,000	2 (1.3)
20,000 to < 40,000	34 (22.4)
40,000 to < 60,000	54 (35.5)
60,000 and higher	62 (40.8)
Type of remuneration	
Alternate payment plan or salaried	78 (51.3)
Service contract (paid hourly or by shift rate)	38 (25.0)
Fees for services	33 (21.7)
Other or combination	3 (2.0)
Level of familiarity with PA	
Has heard of or read about PA before	139 (91.4)
Has been involved in formal teaching of PAs outside of clinical shifts	24 (15.8)
Has worked with PAs in training on clinical shifts	47 (30.9)
Has worked with fully trained PAs on clinical shifts	11 (7.2)
Has been directly involved in PA legislation (policy making) either at the ministry level or through medical associations and colleges	2 (1.3)

ED = emergency medicine; PA = physician assistant; PEM = pediatric emergency medicine.

Table 2. Level of PA involvement selected for each clinical category by physicians practicing pediatric emergency medicine in Canada

Clinical condition	Respondents (n)	PA without direct supervision: proportion of respondents (95% CI)	PA with direct supervision: proportion of respondents (95% CI)	No PA involvement: proportion of respondents (95% CI)	Predominant CTAS level
Epistaxis that has resolved on presentation	77	0.83 (0.73–0.91)	0.16 (0.08–0.26)	0.01 (0.00–0.07)	4
Insect bites (swelling, itchy, concerns about infection)	77	0.75 (0.64–0.84)	0.23 (0.14–0.34)	0.03 (0.00–0.09)	
Burns (includes friction and scald burns)	77	0.53 (0.42–0.65)	0.45 (0.34–0.57)	0.01 (0.00–0.07)	
Minor head injuries	77	0.44 (0.33–0.56)	0.55 (0.43–0.66)	0.01 (0.00–0.07)	
Foreign body (swallowed, in nose, in ear, in eyelid) without airway compromise	77	0.52 (0.40–0.63)	0.45 (0.34–0.57)	0.03 (0.00–0.09)	
Non-limb-threatening injuries to extremities, including lacerations	77	0.44 (0.33–0.56)	0.55 (0.43–0.66)	0.03 (0.00–0.09)	
Scheduled revisits for outpatient intravenous therapy or home observation and reassessment	77	0.71 (0.60–0.81)	0.25 (0.16–0.37)	0.04 (0.01–0.11)	
Mild or suspected injury due to animal bites (e.g., dog, cat, hamster)	77	0.51 (0.39–0.62)	0.44 (0.33–0.56)	0.04 (0.01–0.11)	
Device- (lines, tubes) or cast-related concerns (dysfunction) and requests (removal, replacement)	77	0.39 (0.28–0.51)	0.55 (0.43–0.66)	0.05 (0.01–0.13)	
Ear pain or discharge	77	0.52 (0.40–0.63)	0.42 (0.30–0.53)	0.05 (0.01–0.13)	
Nontraumatic dental or oral mucosal complaint	77	0.52 (0.40–0.63)	0.40 (0.29–0.52)	0.06 (0.02–0.15)	
Voiding dysfunction or dysuria	77	0.38 (0.27–0.49)	0.57 (0.45–0.68)	0.05 (0.01–0.13)	
Known asthmatic in exacerbation	77	0.30 (0.20–0.41)	0.64 (0.52–0.74)	0.05 (0.01–0.13)	
Rash with viral infection symptoms	77	0.47 (0.35–0.58)	0.45 (0.34–0.57)	0.06 (0.02–0.15)	
Urticaria or pruritic rash	75	0.48 (0.36–0.60)	0.44 (0.33–0.56)	0.07 (0.02–0.15)	
Nontraumatic musculoskeletal complaints (pain/swelling)	77	0.30 (0.20–0.41)	0.62 (0.51–0.73)	0.08 (0.03–0.16)	
Minor back injuries	76	0.37 (0.26–0.49)	0.55 (0.43–0.67)	0.07 (0.02–0.15)	
Cellulitis, adenitis, abscesses	75	0.23 (0.13–0.33)	0.67 (0.53–0.75)	0.09 (0.04–0.18)	
Nontraumatic eye complaints (disease of eyelids, conjunctiva, nonspecific eye pain, or visual changes)	77	0.27 (0.18–0.39)	0.61 (0.49–0.72)	0.10 (0.05–0.19)	
Acute abdominal pain, including constipation	77	0.05 (0.01–0.13)	0.79 (0.66–0.88)	0.16 (0.08–0.26)	
Vomiting and diarrhea without bleeding	76	0.54 (0.42–0.65)	0.45 (0.33–0.57)	0.03 (0.00–0.09)	3 or 4
Fever with cough, rhinorrhea, or sore throat	76	0.54 (0.42–0.65)	0.45 (0.33–0.57)	0.03 (0.00–0.09)	
Respiratory distress not otherwise specified (bronchiolitis, noisy breathing, possible pneumonia)	76	0.00 (0.00–0.05)	0.89 (0.80–0.95)	0.11 (0.05–0.20)	
Fall not otherwise specified	76	0.24 (0.15–0.35)	0.72 (0.61–0.82)	0.04 (0.01–0.11)	
Mild to moderate injury to more than 1 area (e.g., ankle and wrist injuries or laceration to forearm and facial abrasions)	75	0.41 (0.29–0.52)	0.51 (0.38–0.61)	0.07 (0.02–0.15)	
Nonaphylactic allergic reaction or suspected allergic reaction	77	0.39 (0.28–0.51)	0.53 (0.42–0.65)	0.06 (0.02–0.15)	
Complaints of female genitalia (vulvovaginitis) or menstrual disorder	77	0.26 (0.17–0.37)	0.62 (0.51–0.73)	0.10 (0.05–0.19)	
Nontraumatic disease of male genitalia (pain, swelling, or discharge)	77	0.17 (0.09–0.27)	0.66 (0.55–0.77)	0.16 (0.08–0.26)	
Nontraumatic bone disease (nonspecific pain; may include osteomyelitis)	76	0.01 (0.00–0.07)	0.83 (0.73–0.91)	0.16 (0.08–0.26)	
Involvement in a transport (motor or bicycle) collision	77	0.10 (0.05–0.19)	0.66 (0.55–0.77)	0.22 (0.13–0.33)	
Mild to moderate injury to chest or abdomen	77	0.03 (0.00–0.09)	0.74 (0.63–0.83)	0.23 (0.15–0.34)	
Assault (alleged, suspected, or threatened)	76	0.08 (0.03–0.16)	0.57 (0.45–0.68)	0.36 (0.25–0.47)	
Nonspecific masses or lesions	77	0.04 (0.01–0.11)	0.55 (0.43–0.66)	0.42 (0.30–0.53)	

Table 2. Continued

Clinical condition	Respondents (n)	PA without direct supervision: proportion of respondents (95% CI)	PA with direct supervision: proportion of respondents (95% CI)	No PA involvement: proportion of respondents (95% CI)	Predominant CTAS level
Postprocedure or treatment reactions (e.g., postoperative concerns or vaccination or medication reaction)	76	0.21 (0.13–0.32)	0.70 (0.58–0.80)	0.09 (0.04–0.18)	3
Recurrent vomiting/spit up without diarrhea or fever	76	0.11 (0.05–0.20)	0.80 (0.69–0.89)	0.09 (0.04–0.18)	
Neonatal jaundice	76	0.14 (0.07–0.24)	0.74 (0.62–0.83)	0.12 (0.06–0.21)	
Noninfectious upper respiratory tract complaint (pain NYD or nonacute symptoms)	77	0.25 (0.16–0.36)	0.62 (0.51–0.73)	0.12 (0.05–0.21)	
Mental health concerns (psychiatric or behavioural disorder)	76	0.18 (0.10–0.29)	0.67 (0.55–0.77)	0.14 (0.07–0.24)	
Feeding difficulty in an infant	76	0.04 (0.01–0.11)	0.82 (0.71–0.90)	0.14 (0.07–0.24)	
Semiacute abdominal lump suggestive of hernia (inguinal or umbilical)	77	0.17 (0.09–0.27)	0.69 (0.56–0.78)	0.14 (0.07–0.24)	
Fever without focus	76	0.04 (0.00–0.11)	0.80 (0.70–0.89)	0.16 (0.08–0.26)	
Chronic bowel disorders such as IBD exacerbation	76	0.07 (0.02–0.15)	0.76 (0.65–0.85)	0.17 (0.09–0.27)	
Self-limiting hematemesis or blood per rectum	75	0.07 (0.02–0.15)	0.76 (0.66–0.85)	0.17 (0.010–0.28)	
Chest pain not otherwise specified without cardiorespiratory compromise	76	0.12 (0.06–0.21)	0.68 (0.57–0.79)	0.20 (0.11–0.30)	
Crying in an infant or nonverbal young child	75	0.05 (0.01–0.13)	0.73 (0.62–0.83)	0.20 (0.12–0.31)	
Intoxication (alcohol or recreational drugs)	77	0.14 (0.11–0.30)	0.66 (0.55–0.77)	0.19 (0.11–0.30)	
Known renal disease or abnormal urine	77	0.08 (0.03–0.16)	0.70 (0.59–0.80)	0.21 (0.12–0.32)	
Medication ingestion accidental or intentional	76	0.07 (0.02–0.15)	0.71 (0.60–0.81)	0.22 (0.14–0.33)	
Nonspecific malaise including dizziness, fainting, pallor, and fatigue	76	0.01 (0.00–0.07)	0.76 (0.65–0.85)	0.22 (0.14–0.33)	
Episodic neurologic symptoms such as seizure disorders, febrile seizures, and recurrent headaches	77	0.00 (0.00–0.09)	0.70 (0.59–0.80)	0.27 (0.18–0.39)	
History of dusky spell (may include apnea or breath holding) that is resolved on presentation	76	0.01 (0.00–0.07)	0.70 (0.58–0.80)	0.29 (0.19–0.41)	
Blood disorder (anemia, thrombocytopenia, or coagulopathy)	77	0.05 (0.01–0.13)	0.62 (0.51–0.73)	0.31 (0.21–0.43)	
Metabolic, endocrinologic, or nutritional concerns	77	0.04 (0.01–0.11)	0.64 (0.52–0.74)	0.31 (0.21–0.43)	
Known or suspected immunodeficiency	77	0.03 (0.00–0.09)	0.62 (0.51–0.73)	0.35 (0.25–0.47)	
Known or suspected liver disease (jaundice outside of neonatal period)	76	0.00 (0.00–0.05)	0.63 (0.51–0.75)	0.37 (0.26–0.49)	
Focal neurologic symptoms	76	0.00 (0.00–0.05)	0.57 (0.45–0.68)	0.43 (0.32–0.55)	
Heart and circulatory complaint (abnormal heartbeat and pallor)	76	0.00 (0.00–0.05)	0.55 (0.43–0.67)	0.45 (0.33–0.57)	

CTAS = Canadian Triage and Acuity Scale; IBD = inflammatory bowel disease; NYD = not yet diagnosed ; PA = physician assistant.

Table 3. Influence of respondents' demographic variables on the proportion of conditions selected for PA involvement

Demographic variable	n	Mean % of clinical conditions selected as appropriate for PA management under direct or indirect MD supervision (SD)	Difference in mean % of conditions selected for PA involvement (95% CI)
Age			
< 30 yr old (ref)	3	72.9 (5.4)	
30 to < 40 yr old	58	85.5 (20.6)	12.6 (5.2–20)
40 to < 50 yr old	51	84.0 (22.7)	11.0 (3.1–18.9)
50 to < 60 yr old	34	86.8 (22.7)	13.9 (4.6–23.2)
60 yr or older	5	83.6 (18.3)	10.6 (–8.4–29.6)
PEM work experience			
< 5 yr (ref)	31	87.9 (15.2)	
5 to < 10 yr	46	85.2 (23.4)	–2.7 (–12.2–6.8)
10 to < 15 yr	34	80.6 (22.4)	–7.3 (–16.9–2.3)
15 yr or more	40	86.3 (21.1)	–1.4 (–10.2–7.4)
Remuneration			
Service contracts (by the hours or by the shift payment) (ref)	38	78.6 (28.1)	
Salaried or alternative payment plan (ref)	77	88.3 (17.3)	17.3 (–19.5–0.1)
Fee-for-service billing	33	83.8 (19.2)	5.2 (–5.9–16.3)
Other or combination	3	93.1 (11.9)	14.5 (–0.1–29.1)
Type of ED			
General ED (ref)	5	73.5 (24.2)	
Dedicated PEM ED	130	85.1 (21.4)	11.6 (–7.9–31.1)
Work at both	16	87.4 (17.4)	13.9 (–5.9–33.7)
ED size (annual volume)			
20,000 to < 40,000 (ref)	36	74.2 (28.9)	
40,000 to < 60,000	54	89.1 (15.9)	14.9 (4.4–25.4)
60,000 or more	61	87.7 (17.0)	13.5 (3–24)

ED = emergency department; PA = physician assistant; PEM = pediatric emergency department.

84% (95% CI 79–89) in the group assigned to the first 28 conditions and 86% (95% CI 82–90) in the group assigned the last 29 conditions.

DISCUSSION

The intention of this national survey was to explore the opinion of practicing pediatric emergency medicine physicians on the level of involvement of PAs in their setting. In addition, the sample size of this study allowed for exploration of factors influencing physicians' opinion of the magnitude of PA involvement in pediatric emergency medicine. Current practice in the United States, Ontario, and Manitoba dictates that PAs work under the supervision of a physician. Although the degree of supervision (the physician directly reviews and assesses all patients or just reviews the documentation) is often open to interpretation and to physician-PA pair preferences; all patients managed by PAs will ultimately remain the responsibility of the

attending emergency pediatricians. Therefore, assessing local acceptability of PAs by pediatric emergency physicians is instrumental if PA expansion to include other provinces is considered. The differences in care patterns and funding mechanisms between the United States and Canada raise the issue of whether PAs will be accepted in Canada to the same extent as in the United States—hence the need to gather the opinion of Canadian PED physicians on the appropriate level of involvement and degree of autonomy PAs should have with nonemergent common clinical conditions managed in a PED.

The results of this study help validate that physicians treating children in PEDs felt that PAs could appropriately contribute to the care of over half of the presented clinical conditions (with either direct supervision or without direct supervision). Although not specifically documented in the literature, experienced PAs practicing in EDs in the United States frequently assess, manage, and discharge patients (including

Table 4. Influence of PA familiarity on the proportion of conditions selected as appropriate for PA involvement

Familiarity with PA	n (%)	Mean % of clinical conditions selected as appropriate for PA management under direct or indirect MD supervision (SD)	Difference in mean % of clinical conditions selected as appropriate for PA (95% CI)
Read about PA			
No	13 (8.6)	76.3 (29.4)	9.6 (−2.6–21.8)
Yes	139 (91.4)	85.9 (19.8)	
Taught PA outside of clinical shifts			
No	128 (84.2)	83.8 (21.9)	8.4 (−0.9–17.7)
Yes	24 (15.8)	92.2 (13.0)	
Worked with PA in training during clinical shifts			
No	105 (69.1)	82.2 (21.8)	9.3 (3.8–14.8)
Yes	47 (30.9)	91.5 (17.4)	
Worked with fully trained PA during clinical shifts			
No	141 (92.8)	84.7 (21.4)	5.8 (0.2–11.4)
Yes	11 (7.2)	90.5 (13.7)	
Involved in PA legislation			
No	150 (98.7)	85.3 (20.9)	−12.9 (−42.7–17.0)
Yes	2 (1.3)	72.4 (20.7)	

PA = physician assistant.

children) without a physician reviewing the case or reassessing the patient. It is understood that as a supervising physician and PA pair gain experience with each other's practicing style, the degree of autonomy afforded PAs increases (referred to as negotiated autonomy).¹⁵ It is therefore not surprising to find that those survey respondents who have worked with either fully trained PAs or PAs in training selected a greater proportion of cases for PA involvement. Furthermore, only 7% of respondents had worked with fully trained PAs and less than a third had worked with PA trainees, which reflects the early stage of PA development in Canada and likely explains respondents' conservative approach to PA involvement in pediatric emergency medicine.

The observed higher proportion of cases selected for PAs from respondents working in larger centres may be related to higher demands and pressure to manage overcrowding and thus the willingness to accept help provided by PAs.

Although we found a statistically significant difference between the mean proportion of cases selected for PA involvement by respondents younger than 30 years old compared to the other groups (encompassing the 30- to 60-year-old categories), only three respondents were under 30 years of age. We were surprised that PED work experience did not affect the mean proportion of cases selected for PA involvement and

speculate that factors such as employment security and competition might account for this lack of an observed relationship.

Although 85% of respondents selected only half of the presented nonemergent clinical conditions for PA involvement, given the relative frequency of ED visits with these conditions, this may represent more than half of all visits to a PED. For example, our pilot study, using the same clinical conditions with a smaller group of physicians, also resulted in only half of the presentations being selected by most physicians as appropriate for PA management. These conditions represented nearly 75% of all PED visits at that centre.¹³

The most important limitation to this study is the sample frame. The PERC database comprises PERC members (physicians involved in pediatric emergency research) and other physicians working in a Canadian PED as identified by PERC members. This database does not include many physicians who treat children in general EDs (less than 5% of respondents work only at a general ED). Because 85% of all emergent care of children in Canada is delivered in general EDs, our results do not capture the views of the majority of physicians who care for acutely ill and injured children. Our results only reflect those of physicians who work primarily at tertiary PEDs. The level of comfort with PA involvement in the care of children seen in general

EDs of emergency physicians may be very different from our findings.

Other points of concern are the sample size and response rate. With a 51% response rate, it is possible that the survey topic itself might have affected the decision to complete the survey. Alternatively, the low response rate among the physicians in the PERC database may be due to survey fatigue. The PERC executive, managing the response rates of surveys using its database, reported a drop from about 60% response rates to about 30% in the year prior to our survey. A decision was then made to significantly reduce the access to this database, and the uptake rate has since come back to about 50%. In addition, our survey also had a decline option and an opportunity for physicians to express why they did not want to take the survey. Only five subjects clicked on the decline link, two expressed that they were too busy and were asked to participate in too many surveys, and another two no longer practice emergency medicine and did not feel that the topic concerned them. Furthermore, we only surveyed each subject on half of the 57 nonemergent clinical conditions, in essence cutting our sample size for each clinical condition by half. Despite this, we were able to meet our estimated required sample size.

CONCLUSION

Our findings suggest that PAs could be involved in a large proportion of PED patient visits. Prudently, we suggest that these interactions would have to be reviewed and reassessed by a physician, not unlike when a medical trainee is seeing patients in the ED. We speculate, however, that with time, a PA will develop rapport with the supervising physician(s), similar to that developed with a subspecialty clinical resident who trains in a department for 2 years. This in turn may alter the balance between cases needing direct physician supervision and those requiring only indirect interaction with the physician. In view of the requirement for PAs to be directly supervised by the emergency pediatrician, evaluations of PAs' impact on ED flow, cost efficiency, and medical trainees' needs will be required to judiciously introduce PAs to PEDs.

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