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Special Topic

Practice Management Knowledge Amongst Plastic Surgery Residents in Canada: A National Survey

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Abstract

Business and practice management principles are critical components of healthcare provision. Business and practice management is currently undertaught in plastic surgery training programs. The objective was to assess the status of business and practice management teaching amongst plastic surgery programs in Canada. An online survey of all enrolled plastic surgery residents was conducted in 2019 to 2020. Participants were invited to rate their knowledge and confidence about core principles in business and practice management. Sixty-five out of 126 residents responded to this survey (response rate, 51.6%). Only 7.8% of participants had previous business and practice management training; 23.1% reported receiving training in business and practice management during their residency. Participants reported a low level of knowledge and confidence in business and practice management (average Likert score between 3 and 4). Participants reported a high desire for future training in business and practice management particularly in billing and coding (91.2%) and business operations (91.2%). Plastic surgery residents in Canada reported a low level of knowledge and confidence about business and practice management. They desire the inclusion of business and practice management training in future curriculum.

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As the costs associated with the provision of healthcare continue to increase, within both publicly and privately funded healthcare systems, the demand for more efficient utilization of limited healthcare resources continues to grow. It is estimated that the cost of healthcare provision, both in Canada and in the United States, will continue to increase at a rate of approximately 8% per annum.¹ A closer examination of healthcare spending reveals that the greatest expenditure is on physician's salaries as well as the cost of new technologies and novel therapies.² Physicians and medical trainees represent the frontline of healthcare provision and, as a result, their practices directly influence the cost of healthcare.

In order to maintain an economically sustainable healthcare system, medical trainees need to be aware of the

principles of practice management that are relevant to healthcare provision. In their seminal article, Zarrabi et al³ proposed 8 essential aspects of practice management. These principles include healthcare marketing, business operations, human resource management, negotiation,

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insurance and medical law, coding and billing, medical record management, and finance and accounting.³ These principles are essential for the day-to-day operations of public and private healthcare systems, and if properly incorporated into practice could lead to improvements in the cost-effectiveness of healthcare provision.

In the current model of medical education, there is a predominant focus on clinical competency, while the non-clinical aspects of medical practice, including business and practice management, go overlooked and undertaught.^{4,5} Studies have shown that trainees and graduates from a variety of subspecialty training programs report inadequate exposure to practice management education during their residency training, even though these trainees feel that this education is important for establishing and maintaining a medical practice after residency.⁵⁻¹¹ Interestingly, surveys of residency program directors and educators have also demonstrated an acknowledgment for the importance of practice management education in residency training programs.^{4,12-14} In fact, the medical education bodies in Canada and the United States have long recognized that practice management should be a core competency in medical training. The Royal College of Physicians and Surgeons of Canada (RCPSC) specifically lists the ability to “manage career planning, finances and human resources in a practice” as a core competency under its “Leader” role.¹⁵ So, if trainees, educators, and the regulatory bodies all recognize the importance of business and practice management education in medical training, why is this topic not being better taught?

Currently, Canadian postgraduate medical training programs are undergoing a transition to a new model of education, termed Competence by Design (CBD). This CBD model aims to focus on competency and skill acquisition, instead of the traditional time-based models of medical education. As part of the CBD model, the final phase of training has been named “Transition to Practice,” wherein the trainee is expected to demonstrate competence and readiness to manage an independent medical practice prior to completion of their training.¹⁶ Therefore, practice management knowledge and skills will become more relevant and will need to be incorporated into the residency curricula in programs adopting this new CBD model. Similarly, the American College of Graduate Medical Education (ACGME) has stated a clear requirement for training programs to integrate practice management principles into their residency curricula as well.⁷ Several studies have shown that exposing trainees to practice management education during residency leads to effective and efficient practice after graduation with a potential reduction in the cost of healthcare provision.^{16,17}

Despite the above mandates, currently, there is a paucity of guidelines or literature pertaining to the integration of practice management principles in surgical training.

A recent systematic review reported only 4 published articles that specifically examined practice management education in surgical training.⁶ A recent survey of 166 plastic surgery residents from the United States found that only 43.5% of respondents had received formal education in business and practice management during their surgical training.¹⁸ Furthermore, only 10.2% of surveyed residents felt that their exposure to business skills was adequate enough to equip them for managing a plastic surgery practice after residency.¹⁸

In Canada, plastic surgery is relatively unique amongst surgical specialties in that plastic surgeons can practice outside of the publicly funded healthcare system. As a result, the majority of plastic surgeons in Canada have a mixed practice involving both the private and public settings, which only serves to magnify the importance of proficiency in business and practice management.¹⁹ In our experience, practice management is not being adequately taught amongst Canadian plastic surgery training programs. To date, there has been no formal assessment of the status of practice management education among Canadian plastic surgery residency training programs.

METHODS

We designed an anonymous survey ([Supplementary Appendix](#)) to assess the current status of practice management education in Canadian plastic surgery residency programs based on resident-reported exposure to and knowledge of business and practice management during training. The survey was designed using a publicly available Google Forms (Google Inc., Mountain View, CA) platform. The study was approved by the University of Toronto Ethics Board and conducted in accordance with the principles of the Declaration of Helsinki. The survey collected data from respondents in 4 main subsections: (1) demographic information (eg, age, gender, university of training, level of training), (2) business education and experience prior to residency training, (3) business and practice management education during residency training, and finally (4) self-reported knowledge about core business principles. Participants were specifically asked to rate their confidence and knowledge in 8 areas of business and practice management as identified by Zarrabi et al in their healthcare business curriculum. This was done using 10-point likert scale with 1 representing lack of knowledge and confidence and 10 is complete knowledge and confidence. These principles have been widely accepted as core components of practice management relevant to surgical training and have been adapted by multiple training programs in the United States.³

The online survey was sent to all residents enrolled in a Canadian plastic surgery residency-training program during the months of August and September of the

Table 1. Demographics of the Survey Respondents

	Marketing	Business operations	Human resources	Negotiation	Insurance and medical regulation	Coding and billing	Medical records	Finance and accounting
PGY1	5.2 ± 2.2	4.0 ± 2.0	3.4 ± 1.8	3.4 ± 1.5	3.4 ± 1.5	2.4 ± 1.7	3.8 ± 2.3	4.6 ± 0.5
PGY2	3.2 ± 2.0	2.8 ± 1.7	2.8 ± 1.8	3.3 ± 2.4	2.6 ± 1.5	3.0 ± 1.3	3.8 ± 1.9	2.6 ± 1.1
PGY3	4.0 ± 2.0	3.7 ± 2.4	3.3 ± 2.3	3.3 ± 2.3	2.6 ± 1.5	3.0 ± 1.5	2.9 ± 1.4	3.6 ± 2.2
PGY4	4.3 ± 1.9	3.3 ± 1.2	3.1 ± 1.1	3.4 ± 1.6	3.5 ± 1.2	3.5 ± 1.5	4.0 ± 1.5	3.3 ± 1.4
PGY5	3.3 ± 1.6	2.3 ± 1.1	3.3 ± 2.1	2.7 ± 1.2	3.3 ± 1.8	3.6 ± 1.6	4.5 ± 1.9	2.9 ± 2.2
P-value	0.232	0.201	0.962	0.863	0.351	0.482	0.210	0.253

2019–2020 academic year. Residents were contacted through institutional e-mail and invited to participate in the survey. Reminder emails were sent 2 and 4 weeks after the initial invitation. Data were directly collected into a Microsoft Excel (Microsoft Corp, Redmond, WA) sheet, and subsequent statistical analysis was performed using SPSS (IBM Corp, Armonk, NY). Categorical variables were presented with percentages. The normality of distribution of continuous variables were assessed with the Shapiro–Wilk test and presented as means (percentages) and standard deviations (SD). Non-normally distributed variables were described and presented as medians with Interquartile Range (IR) and compared using the Wilcoxon Mann–Whitney *U*-test.

RESULTS

The survey was sent to all English-speaking plastic surgery training programs in Canada. In total, 65 plastic surgery residents responded to the survey out of 126 residents enrolled at the time of the study. Hence, the study response rate is 51.6%. Demographics of the survey respondents are shown in Table 1. The mean age of respondents was 29.6 ± 2.4 years (range, 25–37 years). Of all the respondents, 29 (44.6%) were male and 35 (55.4%) were female. The majority of respondents (75.2%) were in their senior years of training (ie, Post-Graduate Year 3, 4, or 5; in Canada, all plastic surgery residency training is a 5-year integrated program). In regard to future practice patterns, 68.5% of respondents envisioned their ideal practice to include a combination of academic, private, and public settings, while only 5.1% desired to have an exclusively private practice.

Amongst all of the respondents, only 5 (7.8%) had formal training in business and practice management prior to the start of their residency. Furthermore, only 15 respondents (23.1%) reported receiving a formal education in business and practice management during their plastic surgery residency training. Collectively, residents

reported a significant lack of knowledge and confidence about business and practice management principles across all of the 8 principles assessed in this study as shown in (Figure 1). Average scores in all areas assessed were between 3 and 4. The highest reported knowledge and confidence was for “marketing,” which averaged 4/10 and the lowest is the area of “human resource management” with an average of 3.2/10. To further assess for the impact that level of training could have on self-reported knowledge of business and practice management principles, respondents were stratified based on the level of training as shown in Table 2. Amongst all 8 business principles assessed, there was no statistically significant difference in the reported level of knowledge by the training year.

Respondents were asked which of the 8 core business and practice management principles they felt were the highest priority for integration into current curriculum (Table 3). In total, 91.1% of respondents felt that “billing and coding” and “business operations” were the most important topics for formal teaching, with 80.5% of respondents also prioritizing “accounting and finances.” More than 60% of respondents felt that all 8 areas of business and practice management assessed in this study were of high priority to be included in plastic surgery training in Canada.

DISCUSSION

Practice management is an essential aspect of plastic surgery that has gone largely undertaught in the current model of postgraduate education.^{6,19–22} Canadian residency programs are currently undergoing a major educational paradigm transition, from the “Traditional Apprenticeship Model” to the new CBD model.¹⁵ The overarching goal incumbent upon this transition has been to identify areas that are essential for trainees’ successful future independent practice and, for trainees, to then demonstrate that they are skilled in these areas prior to their graduation.

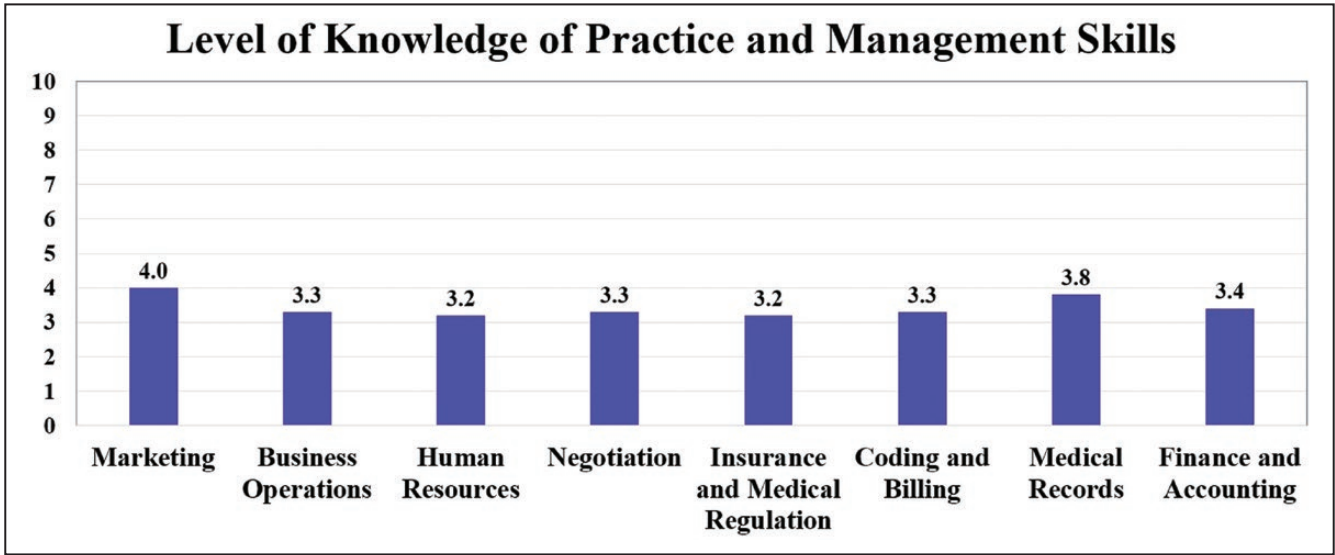


Figure 1. Average level of knowledge amongst trainees regarding business and practice management principles.

Table 2. Average Score of Self-Reported Knowledge of Plastic Trainees About Business Principles

Gender	No. of respondents (%)
Male	29 (45.1)
Female	35 (55.4)
Year of training	
PGY-1	5 (8.2)
PGY-2	11 (17.1)
PGY-3	16 (25.3)
PGY-4	20 (31.1)
PGY-5	12 (19.1)
Preferred setting of practice	
Community	1 (2.1)
Academic	12 (19.3)
Private	3 (5.3)
Hospital	5 (8.2)
Combination of above	44 (68.1)

Within the CBD paradigm, the last phase of residency has been called “Transition to Practice,” whereby trainees will acquire both clinical and nonclinical skills that will aid their future practice. Clinical skills that residents need to acquire are better defined, taught, and integrated into the new CBD model that than nonclinical skills. Nonclinical skills encompass a wide array of essential qualities that

a trainee needs to acquire and demonstrate in order to be able to provide efficient and effective healthcare upon graduation, regardless of the practice setting.

In order to best develop an enhanced new education curriculum for surgical training, it is essential to first explore areas that were lacking in the existing curriculum.^{15,19} Therefore, this study aimed to assess and explore an important nonclinical area that we believed was under taught in traditional surgical training. The survey was designed to explore the knowledge level of our current Canadian plastic surgery trainees with respect to the 8 principles of business and practice management relevant for plastic surgery practice after surgical training (as proposed by Zarrabi et al).³

The results of this national survey of Canadian plastic surgery residents demonstrated that the vast majority of trainees had no formal business training or education prior to starting their plastic surgery residency training. Furthermore, the majority of survey respondents also reported that they had received no formal business or practice management education during their residency training. This finding is very similar to the results found in a study of 166 plastic surgery residents from across the United States wherein only 22.3% reported receiving any formal education in business or practice management during their residency training.¹⁸

When we examined the 8 individual core business principles, we found a consistent lack of self-reported knowledge across all survey participants, while respondents rated coding and billing as well as medical record management the highest. This is likely because those areas are prevalent in current training and practice of plastic surgery trainees and, therefore, most likely to be exposed to

Table 3. Practice Management Principles Priorities for Further Training

Principle	No. of respondents (%)
Billing and coding	59 (91.2)
Business operations	59 (91.2)
Finance and accounting	52 (80.6)
Medical record management	46 (71.1)
Marketing	44 (65.8)
Negotiations	42 (65.1)
Human resources	40 (62.3)
Insurance and medical regulation	40 (62.3)

on a day to day practice. Other areas such as negotiation, medical insurance, and law are less likely to be exposed to on a day-to-day basis and need formal teaching. One of the most concerning findings of this study was the fact that respondents in their final year of residency training (ie, the “transition to practice” year) reported a similar lack of knowledge in all business and practice principles when compared with junior trainees. While this could indicate a lack of progression and knowledge acquisition amongst more senior plastic surgery trainees, we believe that it more accurately reflects the relative lack of education and curricula devoted to practice management amongst Canadian plastic surgery residency training programs. This is supported by the fact that only 23% of survey respondents reported having had any formal teaching in the area of business or practice management areas during their residency training. Interestingly, when we asked respondents which of the 8 core business principles, they felt were the highest priority for inclusion in a formal educational training curriculum, over 60% of respondents felt that all of the topics were of high priority. The results of this study show that not only are current Canadian plastic surgery residents lacking in knowledge regarding practice management, but they also attribute a high value and importance to this subject matter, prioritizing these topics in any new curriculum development. There have been recent efforts by various plastic surgery societies such as The Business of Watching Your Practice to encourage further knowledge in this subject matter. These are additional supplemental sources trainees can seek out to improve their knowledge and confidence in establishing their future practice.

The findings from this study are in line with other surveys conducted. Furthermore, 60% of 269 recently graduating ophthalmologists from the United States reported being poorly prepared for practice management after graduation.¹⁹ This indicates that such deficiency in current surgical

training is prevalent across different specialities. Moreover, a survey of 267 of training directors reported that 87% of them appreciate the need for business and practice management integration into surgical training.⁴

This study has shown that further training in “billing and coding” was the most highly prioritized of the 8 core business principles by Canadian plastic surgery residents. A study by Austin and von Schroeder⁵ compared billing knowledge and accuracy amongst a group of 16 senior surgical residents and 17 staff surgeons. This study found that while staff physicians had a greater accuracy that residents on a billing assessment with more correct codes and fewer incorrect or missed codes, the overall billing accuracy in both groups was poor. Amongst the respondents who had received formal billing education during residency training, the majority in both cohorts rated the education as “poor.” Furthermore, 100% of residents and 79% of staff respondents in this study indicated that they would have desired more billing education during their residency training. Amongst the staff physicians, nearly 58% of respondents in this study felt that they lost over 5% of their income annually due to billing errors or omissions. Neglecting such a critical aspect of business and practice management clearly can have a significant impact not only on an individual’s confidence during the start of their practice, but it may also have a direct impact on their income. This only further supports the importance of integrating nonclinical training, such as business and practice management, into residency training curricula.

We recognize that clinical knowledge in surgical training is a demanding endeavor, and there exists a finite time period for knowledge acquisition. Some may worry that incorporating a formalized nonclinical teaching curriculum might dilute the clinical exposure of trainees. Nevertheless, we believe that business and practice management is an essential element of surgical training that can be taught outside of clinical hours without compromising trainees’ exposure and knowledge. Longitudinal series of business and practice management seminars led by senior mentors targeting senior trainees and junior faculty could be a valuable resource to achieve financial and business competence. Such nonclinical skills could also lend themselves to an online curriculum in which trainees can learn and demonstrate competence in understanding and application of business and practice management principles. Utilizing new methods of information delivery such as virtual classrooms are ideal for teaching business and practice management principles.

Resident-led aesthetic clinics create a rich and valuable environment for clinical and nonclinical learning. A systematic review by Kaplan et al²³ have shown that trainees and trainers rate the clinical and nonclinical learning from such clinics to be very valuable. Despite this study being the first to investigate current status of business and practice

management knowledge and education among plastic surgery trainees in Canada, we recognize that this study has its inherent limitations. While the response rate of 51.6% for this online national survey of plastic surgery residents is considered acceptable, it does leave the results open to potential nonresponse bias. Although we cannot determine with certainty whether the non-responders had a similar exposure to practice management education as the survey respondents, we feel that the diversity of responses from programs across the country does provide a representative sample of the program-wide teaching practices for business and practice management. Furthermore, only 19% of the study respondents were in their final (PGY 5) year of training. One may presume that any formal or informal practice management education would be focused on trainees in their most senior years, and it is possible that the majority of the survey respondents simply had not progressed to the level in their training when this education was provided. However, based on the fact that self-reported knowledge of the 8 core business principles amongst PGY 5 residents did not significantly differ from residents in earlier years of training, we do not feel that this is likely to be a significant confounder. As with any survey, these responses to this study are susceptible to recency bias, and trainees could potentially only recall their most recent exposure and experience regarding practice management education. Given the length of the survey and the fact that the concepts being assessed were similar and repetitive (ie, past vs current vs desired practice management education), survey fatigue may have become an appreciable limitation. Additionally, this survey did not ask for any passive acquisition of business and practice management principles in an informal setting. Furthermore, there is no section on legal issues and malpractice in our study, which has its survey derived from the paper by Zarrabi et al. In today's medical climate, this is an important aspect of future practice of plastic surgery and future studies should explore this issue. Finally, this study did not explore the preferred methods of integrating business and practice management principles within the current plastic surgery residency curricula, which remains an area for potential future study.

CONCLUSIONS

Canadian plastic surgery trainees report a lack of knowledge about core areas of business and practice management. There is a limited exposure and formal training in business and practice management principles in the current plastic surgery curriculum in Canada. Respondents reported a high desire to receive formal business and practice management training. This is critical to ensure that residents are equipped with nonclinical skills for successful practice

beyond residency training. Furthermore, it is imperative to include business and practice management principles as a core component of any future curricula as Canadian residency programs transition to Competence by Design.

Supplementary Material

This article contains supplementary material located online at www.asjopenforum.com.

Disclosures

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