Quantitative and qualitative impact of physician assistants in a Canadian urology setting

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ABSTRACT

INTRODUCTION: Physician assistants (PAs) are healthcare professionals who act as physician extenders. PAs are being used more and more in a wide variety of clinic settings throughout Canada to increase access to healthcare and reduce cost. We set out to determine the impact of PAs on a tertiary care center urologic oncology practice.

METHODS: We reviewed Ontario Health Insurance Plan (OHIP) billing codes since the introduction of PAs for two attending urologists at Princess Margaret Cancer Centre. Data were grouped into *early experience* and *established experience.* In addition, questionnaires were electronically distributed among nurses, physicians, residents, and fellows who work with PAs in clinic. Patient visits conducted by PAs were tracked for one quarter to estimate the amount of annual patients seen by PAs. The costs associated with PAs are presented as recommendations for a new graduate PA hire.

RESULTS: On average, PAs increased clinic volume by 11.3 patient visits per day. Furthermore, they individually care for an average of 24 patients per day. PAs did not represent a financial burden on the urology practice plan (revenue gain of $16 800). Our questionnaire demonstrated that PAs were capable healthcare professionals, who decreased workload and contributed to resident/fellow education.

CONCLUSIONS: PAs in a Canadian urology practice allow for more patient visits, decrease in physician workload, and positively impact trainee education. PAs saw more patients in clinic than clinic growth, thereby decreasing physician, fellow, and resident workload. The offset of the increase in patient visits made the PAs a cost-neutral investment.

INTRODUCTION

Physician assistants (PAs) are healthcare professionals who act as physician extenders to provide a broad range of medical services. PAs were first introduced in the Ontario medical system in 2007. The profession continues to grow, expanding into a wide variety of clinic settings throughout Canada. Currently, there are approximately 800 PAs working across Canada in a wide variety of clinical settings.[1] PAs were first introduced to the urology group at Princess Margaret Cancer Centre in 2014 to maintain quality and timely care for patients.

There have been very few studies regarding the experiences of PAs from a Canadian perspective and none from a urology perspective. Limited Canadian studies to date have demonstrated the benefits of PAs in the context of orthopedic surgery, where the addition of a PA to an orthopedic service increased surgical throughput[2] and increased physician free time.[3] Introduction of PAs into infectious disease service decreased length of time to consult and reduced length of hospital stay.[4] The introduction of PAs into a general surgery service decreased resident workload and reduced the number of late discharges.[5]

We set out to consider the impact of the introduction of PAs into a tertiary center urologic oncology practice. We looked at total number of patient visits, number of patient visits managed by PAs, cost of PAs to the urologist, and the added benefits of PAs to the other members of the oncology clinic.

KEY MESSAGES

- PAs allow for sustainable growth of patient visits in urology clinics.
- The offset of the increase in patient visits make PAs a cost-neutral investment.
- PAs improve workload for physicians, residents, and fellows and have a positive impact on trainees' education.

METHODS

PA impact on the tertiary urology program was assessed multiple ways. First, we looked at patient access to care by reviewing Ontario Health Insurance Plan (OHIP) billing codes, broken down quarterly, since introducing PAs into outpatient urology practice for two attending urologists at Princess Margaret Cancer Centre. Data were grouped into two separate periods: an *early experience* and an *established experience* of PAs (early: 2014 Q2–2015 Q3; established: 2016 Q4–2019 Q4). There was a gap between the two periods, as there were no PAs working (due to maternity leave) with the team during that period. Data points were displayed using scatterplots demonstrating the number of services provided for each quarter and period, along with the fitted regression lines. All regression analyses were conducted using Newey-West standard errors of lag 1.

Second, we tracked the number of patients seen by PAs (new and followup patients) for a quarter. Patient-managed visits were compared to the growth in the clinics.

Third, an anonymous questionnaire was developed and sent to all nurses, residents, fellows, and physicians with interactions with the urology PAs. Questionnaires were delivered electronically and were optional. Surveys were grouped by role in clinics (nurses, residents, fellows, and physicians). Groups were compared, as well as learners (residents and fellows) vs. non-learners (nurses and staff physicians). The questionnaire (Appendix 1; available at *cuaj.ca*) aimed to interrogate qualitative perceived value to patient care, level of care delivered by PAs, teaching experience, and workload alleviation.

Finally, to establish the cost of PAs, the Health Force Ontario (*healthforceontario.ca)* recommendations for a new graduate PA hire salary of $92 000.00 was used for calculations. This was then multiplied by 1.2 to cover employee benefits and vacation. The salary was multiplied by 0.6 to represent clinical days spent with the two urologists over a two-week period. We tracked the number of patients seen directly by the PAs over a billing quarter. The number of visits managed by PAs was compared to clinic growth and to establish a monetary value for the PAs. PAs do not bill OHIP; however, patient visits conducted by PAs with physician involvement/supervision were billed by supervising physician. To estimate PA value, OHIP billing codes were used — specific assessment (A353) for all followup patients and consultation (A355) for all new patients visits.

The adjusted cost of Pas was calculated as 92 000 x (1.2) x 0.6 - ((x(A353) + y(A355)) x 3 days x 48 weeks). This formula represents three days of clinical volume per week. The PAs are working the other two days, although the lack of billing data from the other two days makes the full calculation impossible. Nonetheless, the PAs are working in other physicians' clinics with comparable volumes. It should be noted that during the study time, clinical space and resources at Princess Margaret Cancer Centre did not change.

RESULTS

Patient visit impact

Our *early experience* period showed the average number of visits increased by 308 patient visits per quarter over the first six quarters. This translates into 8.5 additional patient visits per clinic, which adjusts to 42.7 extra patient visits per five-day work week. In the first six quarters of our *established experience* period, we experienced continued growth by an average of 98 additional patient visits per quarter. This translates to 56.4 extra patient visits per five-day work week, representing 11.3 additional patients seen per clinic. Linear regression coefficients for each period (Figure 1) demonstrate the following parameters: early experience period, slope 74.9, 95% confidence interval (CI) -9, 158.7, p=0.068; *established experience* period, slope 17.4, 95 CI -0.5, 35.3, p=0.056. A trend towards statistical significance was observed between the two periods (p=0.087) (Figure 1).

Although average clinic volume grew by 11.3 clinic visits, PAs on average accounted for 24 patients per day, including two new patients. This is explained by fewer patients being seen by residents, fellows, and staff.

Questionnaire results

A total of 46 surveys were distributed, with a completion rate of 89% (41/46). In general, PAs were perceived to be competent healthcare professionals, with

88% of respondents stating that they function at the level of a postgraduate year 3 (PGY3) or higher, and 39% of respondents stating that they function at a postgraduate year 5 (PGY5) or fellow level. Ninety-eight percent of respondents felt that PAs had the knowledge and confidence to deal with most patients seen in the urology clinic.

PAs also had a positive impact on residents and fellows in clinic. Ninety-two percent of fellows and residents felt that PAs reduced their workload in clinic and 74% felt that they directly or indirectly enhanced their learning. Among all groups, 95% of respondents felt that clinic volume would have to be reduced if PAs were removed from clinics (Figure 2).

We also performed sensitivity analyses regarding reduced workload for attending urologists among only medical doctors (attending physicians, fellows, and residents) who responded to the workload question, as well as attending physicians only. These analyses demonstrated that 93% of medical doctors (27/29 respondents) and 100% of attending physicians (5/5 respondents) also endorse reduced workload. Two residents and one attending staff did not respond to the question. In addition, all respondents felt that PAs would be helpful on the urology ward and 30% felt that they would be helpful in the operating room. There was no significant difference in response distribution between each group or learners vs. non-learners ($p>0.05$).

PA cost models

PAs are currently funded completely by the urology partnership via a combination of philanthropic support and out-of-pocket cost to urologists. The cost was subsidized by 50% in the first year with the HealthForceOntario Career Start Program. This was not used in the calculation assessing cost. Cost analyses of the introduction of PAs into the urology group can be interpreted by revenue generated by clinic volume growth (estimated at 11.3 patient clinic visits in this analysis) or by actual number of patients seen by PAs (estimated at 24 patient visits in this analysis). Using the volume growth approach, there was a net revenue of $16 800 per year (based on a five-day work week and 48 work weeks per year). Using the actual number of patients seen by PA approach, there was a net revenue of $65 280 per year (based on a five-day work week and 48 work weeks per year).

DISCUSSION

PAs were introduced into the urology group at Princess Margaret Cancer Centre in 2014, in an effort to maintain quality and timely care for patients. During the *early experience* after PA introduction, an additional 8.5 patient visits per clinic were realized. This adjusts to 42.7 extra patient visits per five-day work week. Furthermore, once established, an additional growth was witnessed up to 11.3 patient visits per clinic. Our findings corroborate those of Taylor et al, who demonstrated that PAs increase a physician's ability to see more patients.[6] In addition, PAs could assess less complex cases, complete forms, and perform minor procedures to allow physicians to be more efficient.[6]

An interesting observation was that PAs, on average, saw more than twice as many patients as the marginal growth in clinic volumes themselves (11.3 vs. 24 patient visits). The disconnect between growth in clinics and the amount of patients seen by PAs is felt to be a result of several factors. These include more face time for physician-patient interaction,[6] as well as

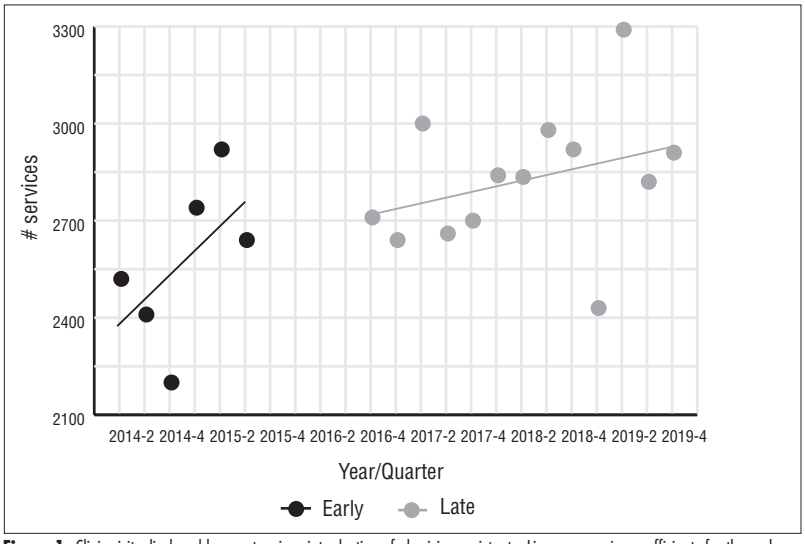

Figure 1. Clinic visits displayed by quarter since introduction of physician assistants. Linear regression coefficients for the early and late experience periods. A trend towards statistical significance was observed between the two periods ($p=0.087$).

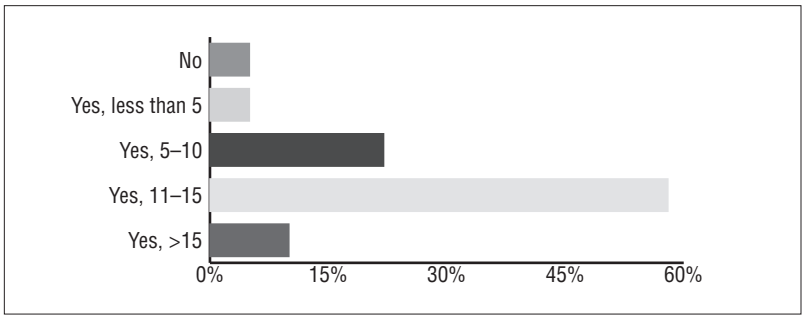

Figure 2. Replies to the question: If the physician assistant was removed, would the number of patients seen need to be reduced? If yes, by how many?

better teaching experience for learners. Indeed, our questionnaire enforces that PAs do have a positive impact on the learning environment for residents and fellows. Moreover, given that each PA-physician relationship is different, the PAs autonomous responsibilities will impact the time needed to review cases prior to completing the patient visit, which will ultimately have an impact on the total patients that can be seen.[6] Other barriers to clinic growth that may also explain this disconnect include access to administrative staff, nursing, and physical infrastructure. The questionnaire results reinforce that PAs manage a significant number of patients in clinics, as 67% of respondents felt that if PAs were removed from clinic, patient volume would need to be reduced by at least 11 patients.

Additional learning from the questionnaire demonstrated that the introduction of PAs did not just increase clinic volumes, but also decreased workload for fellows and residents and had positive impacts on resident/fellow education. This is similar to findings by Bohm et al, where 83% of residents surveyed agreed that PAs reduced their workload.[3] There were differences noted between our results and Bohm's, as we found that 78% of residents and fellows reported that PAs influenced their learning, while Bohm et al showed no improvement in education or training in the operating room.[3] The healthcare practitioners we surveyed believed that PAs could have additional benefit to the urology team if used in the operating room and on the urology ward, managing inpatients and consults, as seen by Bohm et al and Decloe et al in their reports.[3,4] Decloe et al demonstrated a decrease in time to consult and length of hospital stay, while the results of the Bohm et al survey showed that fully trained PAs provide surgical assistance equal to a PGY5.[3,4]

Studies by both Taylor et al and Bohm et al showed widespread agreement that PAs improve physicians' quality of life,[3,6] with the primary motivation of physicians interviewed by Taylor et al noted as improving work-life balance and not financial gain.[6] In our cost analysis, we perceive that the addition of PAs represents a cost-neutral investment in the Canadian urology landscape. There is, however, a limitation in our calculation of the monetary value of the PAs. For simplicity, patients seen by PAs were grouped as followup patients and assigned a value equal to A353 (specific assessment) and new patients were assigned a value equal to A355 (new consultation). Billing codes A354 (partial assessment) and A935 (special surgical consultation) are not used in the calculation. Also, small procedures like hormone injections, uroflowmetry, and postvoid residual were excluded. This likely underestimates the billings that we attribute to the PAs.

Another limitation to our study is the lack of patient-related outcomes measured with respect to PA interactions. Further studies examining PAs' impact on patient satisfaction are encouraged to help assess the quality of care delivered by a healthcare team using PAs. This is even more relevant given an increase in present-day focus to use PAs and nurse practitioners.

CONCLUSIONS

The introduction of PAs in our urologic oncology allowed for an increase in patient visits. Unexpectedly, PAs saw more patients in clinic than the rate of overall clinic growth, decreasing physician and trainee workload. Our practice experienced other benefits as well, such as improving trainee education. The offset of the increase in patient visits made the PAs a cost-neutral investment.

COMPETING INTERESTS: The authors do not report any competing personal or financial interests related to this work.

This paper has been peer-reviewed.

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