

The timing of transition to senior surgical resident: a national survey of Canadian program directors

Le moment de la transition vers le poste de résident senior en chirurgie : une enquête nationale auprès des directeurs de programmes canadiens

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Abstract

Introduction: Transitions within medical education are challenging and mark significant changes in responsibility and independence. The transition from junior to senior surgical resident has been sparsely examined. The purpose of this study was to evaluate the timing of this transition in Canadian surgical programs and the factors used to guide this decision.

Methods: We developed a cross-sectional, single-stage survey and distributed it to all Canadian surgical program directors. We analyzed survey responses using quantitative methods.

Results: Forty-seven program directors responded, representing all ten surgical disciplines. The most frequent period of transition from junior to senior resident was July of PGY-3. Programs that employ a formal "transition" curriculum for juniors had a significantly earlier transition, while programs that use staff feedback to guide the transition decision had a significantly later transition. Program directors identified year of training and experience, technical ability, and clinical competence as key features of a senior surgical resident.

Conclusions: Surgical residency programs largely use a time-based model to determine when residents transition from junior to senior resident. Future qualitative studies should examine the factors used to make transition decisions and explore how programs define a senior surgical resident.

Résumé

Introduction : Les transitions au cours de la formation médicale sont difficiles et marquent des changements significatifs en ce qui a trait à la responsabilité et à l'indépendance. La transition de résident junior à résident senior en chirurgie a été peu étudiée. L'objectif de cette étude était d'évaluer le choix du moment de cette transition dans les programmes de chirurgie canadiens et les facteurs utilisés pour guider cette décision.

Méthodes : Nous avons élaboré un sondage transversal en une seule étape et l'avons distribué à tous les directeurs de programmes de chirurgie canadiens. Nous avons analysé les réponses à l'aide de méthodes quantitatives.

Résultats : Au total, quarante-sept directeurs de programmes ont répondu, représentant les dix disciplines chirurgicales. La période la plus fréquente de transition entre le résident junior et le résident senior était le mois de juillet de l'année R-3. Les programmes qui utilisent un programme formel de « transition » pour les juniors avaient une transition significativement plus précoce, tandis que les programmes qui tiennent compte des commentaires du personnel pour guider la décision de transition avaient une transition significativement plus tardive. Les directeurs de programme ont identifié l'année de formation, l'expérience, la capacité technique et la compétence clinique comme des caractéristiques clés d'un résident senior en chirurgie.

Conclusions : Les programmes de résidence en chirurgie utilisent largement un modèle basé sur le temps pour déterminer quand les résidents passent du statut de résident junior à celui de résident senior. De nouvelles études qualitatives devraient examiner les facteurs utilisés pour prendre les décisions de transition et explorer la façon dont les programmes définissent un résident senior en chirurgie.

Introduction

The Royal College of Physicians and Surgeons of Canada (RCPSC) identifies four distinct transitions in medical training: transition into medical school, transition to clinical duties in medical school, transition from undergraduate to postgraduate training, and transition to independent practice.¹ Transitions are dynamic and critical components of the medical education continuum, and are associated with large changes in responsibility.² While often described as stressful and challenging, they are also considered opportunities for enhanced learning and personal development.³⁻⁶ The RCPSC recommends standardization of transitions as part of competency-based medical education (CBME) to ensure resident competence and patient safety.^{7,8}

Transitions within postgraduate training have been sparsely examined in the literature, including the transition from junior to senior resident.^{6,9} It is unclear when surgical residents currently transition to the senior role during their training. Additionally, as residency programs in CBME are encouraged to use measurable outcomes and assessments to inform resident progression, it is unclear what factors programs are using to make the decision to transition.⁷ Therefore, the purpose of this study is to examine the current state of the junior to senior transition in surgical programs across Canada and identify the factors used in the decision-making process.

Methods

Cross-sectional single-stage survey development

We developed a preliminary survey based on available evidence in the literature and tested it for readability and clarity by sending it to local surgical specialty program directors. The final survey had 21 questions. For the purposes of the study, we considered a resident to be a “senior” if they took overnight call as the senior-most resident for their specialty in the hospital (i.e., not if they are the most senior resident during daytime but not yet taking senior call). All surgical program directors in Canada (general surgery, orthopedic surgery, plastic surgery, cardiac surgery, neurosurgery, obstetrics and gynaecology, urologic surgery, otolaryngology, vascular surgery, ophthalmology) ($n = 139$) received the survey through REDCap.^{10,11} There were no exclusion criteria. The survey completion period lasted eight weeks, from August 9th, 2023 to October 4th, 2023. Potential respondents received reminders at two-week intervals. We considered surveys complete if respondents answered >80% of the questions.

Data analysis

We converted the reported timing of transition to senior resident to a linear scale, based on months of training, where July PGY-1 was represented by 0, July PGY-2 was 13, July PGY-3 was 25, July PGY-4 was 37, and July PGY-5 was 49. Numerical data was tested for normality using the Shapiro-Wilk test. We used student t-tests and ANOVA to compare time of transition to other survey variables. We reported normally distributed continuous data as a mean \pm standard deviation. We analyzed responses to the free-text open-ended question “What do you think defines a junior versus senior surgical trainee?” using conventional content analysis to identify common characteristics and completed frequency counts.¹² Author EM coded each response with up to five different words or phrases. The study received institutional ethics approval on July 13, 2023 (REB# 2023-123398-81756). We used a CROSS checklist to guide study methodology and reporting.¹³

Results

There were 50 survey responses, however three responses were excluded when at least 80% of the questions were not completed, leaving 47 to analyze (response rate 34%). There were no instances of missing data within the 47 remaining responses. Table 1 outlines the demographics of responding program directors and surgical programs. All surgical disciplines had transitioned to CBME at the time of survey.

Figure 1. outlines the typical timing of when different programs transition residents from junior to senior. The mean (25.6 ± 11.7) and mode ($n = 13$, 28%) transition month was July of PGY-3. Five programs (11%) reported transitioning residents in PGY-1.

The time of transition in recent years was reported as unchanged in 34 programs (72%), while seven programs (15%) shifted their transition time earlier. Forty programs (85%) consistently transition residents regardless of the hospital where the residents are currently on rotation. Five programs (11%) differ the timing based on the hospital.

The five most frequent considerations used to determine time of transition were time-based ($n = 33$, 70%), feedback from staff ($n = 21$, 45%), call schedule coverage needs ($n = 21$, 45%), competence committee reviews ($n = 16$, 34%) and number of residents per year ($n = 13$, 28%). Ten programs (21%) use EPAs to help determine the time of transition. Twenty-eight program directors (60%) said they will use the same considerations going forward.

Table 1. Demographic characteristics of program directors and surgical program characteristics

Characteristic	No. (%) N = 47
Number of years being program director	
1-5	33 (70)
5-10	11 (23)
>10	3 (6)
Program director years practicing in medicine	
<5	2 (4)
5-10	21 (45)
10-15	8 (17)
15-20	9 (19)
>20	6 (13)
Surgical specialty	
General Surgery	10 (21)
Plastic Surgery	4 (9)
Orthopedic Surgery	6 (13)
Cardiac Surgery	2 (4)
Neurosurgery	6 (13)
Obstetrics and Gynaecology	6 (13)
Urology	2 (4)
Otolaryngology	3 (6)
Vascular Surgery	5 (11)
Ophthalmology	3 (6)
Number of residents in program	
1-10	15 (32)
11-20	16 (34)
>20	16 (34)
Location of call for junior residents	
In-House	22 (47)
Home-Call	29 (62)
In-House and Home-Call	4 (9)
Call structure for in-house junior residents	
24h+ shift	15 (68)
Night float	5 (22)
Both 24h+ and night float	1 (5)
Alternate system	3 (14)
Location of call for senior residents	
In-House	10 (21)
Home-Call	40 (85)
In-House and Home-Call	5 (11)
Call structure for in-house senior residents	
24h+ shift	6 (60)
Night float	1 (10)
Both 24h+ and night float	0 (0)
Alternate system	3 (30)

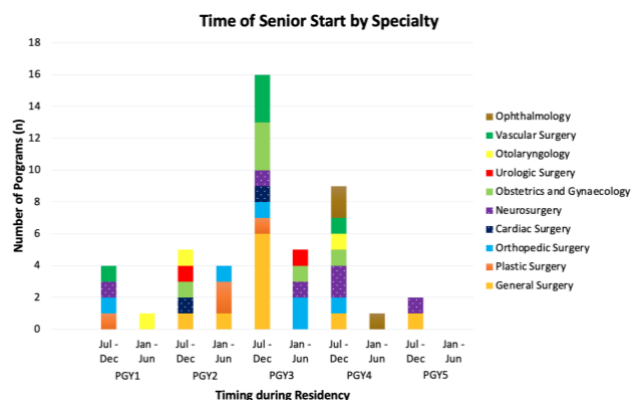


Figure 1. Time of start as a senior surgical resident by the six-month interval.

Fourteen programs reported having a formal curriculum in place to prepare junior residents for the transition to becoming a senior. The most common curriculum components used by programs were surgical foundations curriculum ($n = 8$), boot-camps/simulations ($n = 7$), meetings with program director ($n = 7$), and didactic lectures ($n = 6$). Ten programs (21%) employ a formal “buddy” period where residents have a mix of buddied and non-buddied shifts with a more senior resident.

Twenty-eight program directors (60%) said they would hold back or delay a resident from transitioning to the senior resident role compared to colleagues in their same PGY-year, while ten said they would not, and nine were unsure.

Factors associated with the timing of transition to senior resident

The timing of transition was not significantly affected by the number of residents per program ($p = 0.449$), length of the residency program ($p = 0.592$), or type of junior call structure ($p = 0.706$). Programs with a formal curriculum in place to guide the transition to senior resident had a statistically significantly earlier transition to senior compared to programs that did not (20.4 ± 9.9 months vs. 27.8 ± 11.8 months, $p < 0.05$). Programs that used feedback from staff had a significantly later transition start compared to those that did not (29.7 ± 8.4 months vs 22.5 ± 13.0 , $p < 0.05$). No other factors had a significant association.

Response to open-ended questions

The most frequently mentioned characteristics defining a senior from a junior resident were year of training and experience ($n = 17$), clinical competence and technical ability ($n = 12$), level of independence ($n = 11$) and having completed certain rotations or curricula ($n = 7$).

Discussion

Our study contributes to the literature on periods of transition in post-graduate medical education, particularly the transition within surgical residency from junior to senior resident. This study employed cross-sectional survey methodology to better understand the timing of the transition to senior surgical resident in programs across Canada and the factors that go into making transition decisions.

A majority of programs (70%) transitioned junior to senior residents in PGY-3 or beyond, with the mean and mode time point being July of PGY-3. Program Directors used time-based considerations most often to determine this timing, followed by feedback from staff, and call coverage

needs. With the national adoption of CBME, resident advancement should, in theory, be determined based on competence, rather than PGY-year or time elapsed, to ensure appropriate entrustment and patient safety.^{14,15} However, a minority of programs used competency committees and EPAs to help make the transition decision. That programs rely on time-based considerations is not unexpected, given the logistical and administrative advantages, but also since modern medical training has existed largely as a fixed-time model, rather than a time-variable model.^{14,16} A possible explanation for why programs use EPAs less frequently may be due to not having competencies specific to the senior surgical resident role for their assessments. We found few studies in the literature outlining essential competencies of senior residents.^{9,17,18} Looking at the junior to senior resident transition through the lens of the four stages of training as described in Competence by Design (Transition to Discipline, Foundations, Core and Transition to Practice) may allow programs to identify relevant competencies and EPAs.⁸

Five programs reported the transition to senior resident occurred in PGY-1. An earlier transition time was not found to correlate with size of program or length of residency and all five of these programs represented different specialties. This finding might relate to the definition of “senior surgical resident” used in this survey, where a resident was considered “senior” if they took call as the senior-most resident for their specialty in the hospital. Most medical educators would likely not consider a trainee in their first year of residency “senior;” however, based on our definition they could be. Respondents may have used alternate ways of defining a senior surgical resident, which likely affected the way they answered questions. What constitutes a senior resident has not been well defined in the literature. A 2023 qualitative study looked at the qualities of an “effective senior resident” from the perspective of general surgery residents.¹⁹ Respondents defined a senior resident as the resident on the team with the highest level of experience, which frequently corresponded to highest PGY-level.¹⁹ Studies looking at internal medicine training programs designated trainees as “senior” once they reached PGY-2, with this switch automatically coming with new responsibilities.^{20,21} Another study in general surgery reported how PGY-2 residents start taking in-house calls as the “senior on duty” and described a boot camp curriculum to prepare trainees for this new role.²² This “senior on duty”²² description aligns most with our study’s definition of “senior surgical

resident,” but this role is clearly complex and requires further exploration, ideally using qualitative methodology.

This study found programs with a formal transition curriculum had a statistically significantly earlier time of resident transition. Whether there are other confounding factors explaining this result is unclear. Prior studies have shared their use of curricula to prepare residents for the senior role, with the overarching goal of easing residents through the challenging and intense learning period.^{21–23} Having a transition curriculum has been shown to increase resident confidence, but not necessarily competence, which begs the question of whether having a curriculum in place, in and of itself, justifies an earlier transition time.²²

We found programs that use staff feedback to make transition decisions had a later transition time. One possible explanation for this finding is that staff prefer to have more experienced residents with them on-call as the senior, compared to less experienced residents, so staff who give feedback might recommend a later transition period. Another possible explanation is that programs using staff feedback may conduct a more comprehensive assessment of whether a resident is ready to transition to the senior role, rather than just utilizing time-based criteria. A more comprehensive assessment might reveal a resident is not yet ready to transition, hence the later transition time. However, this explanation is less likely in our opinion given there was no difference in the transition time for programs that used competency committee assessments compared to those that did not.

This study has a number of limitations. Our response rate was 34%, which is low, but in line with the response rate of medical specialists for web-based surveys.²⁴ This was a small sample of a varied group of surgical specialties from across Canada, which limits the interpretability and generalizability of our results, however we did obtain responses from all specialties surveyed. As previously mentioned, our results are limited by the definition of senior surgical resident used in the study design, which likely resulted in a response bias. There is no consensus on what defines a senior surgical resident in the literature, so we did have to create our own definition. We did not adjust our statistical testing for multiple comparisons, as this study was designed with a more exploratory intent and so our results should be further corroborated. Lastly, using a survey is not the ideal method to examine such a complex and poorly defined topic but it provides a starting point for further studies.

Conclusion

Surgical residency programs vary in when they transition a junior to a senior resident. Earlier transition occurs in programs that employ a formal transition curriculum. Based on this study, we recommend conducting qualitative studies to look more intently at the factors residency programs use to decide when to transition a trainee from the junior to senior resident role, as well as how programs define the role of a senior surgical resident. This study highlights the lack of standardization of this transition across Canada. Striving for standardization is an important component of CBME to ensure patient safety and resident competence.

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