

Original Article

Transitioning from medical school to residency: Evaluation of an innovative immersion rotation for PGY-1 paediatric residents

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Abstract

Transition from medical school to residency is stressful due to new responsibilities in patient care.

Objective: To evaluate a new immersion curriculum on the transition from medical school to paediatric residency and its implications for future use in paediatric education.

Methods: In July 2013, a month-rotation offering one-third of time for clinical rounds and two-thirds of time for formal courses was conducted for postgraduate year 1 residents beginning paediatric residency training. Surveys were administered to residents before and after this rotation about their self-confidence in several paediatrics topics and abilities.

Results: Eleven junior residents were enrolled (100% participation rate). Among this cohort, pre- and postintervention confidence surveys showed differences for neonatology ($P<0.001$), respiratory distress ($P=0.01$) and seizure management skills ($P<0.001$). Among abilities surveyed, significant differences were noted for medical emergencies ($P<0.001$) and drug prescriptions ($P<0.002$). The healthy childcare item was the only topic with decreased self-confidence levels. Overall, 45.5% of participants felt confident and ready to begin clinical rotations in the paediatric program following completion of the rotation.

Conclusion: First year paediatric residents who participated in this new curriculum felt their confidence was enhanced in several areas of paediatrics. These findings supported our program committee members in their decision to pursue this rotation since 2013, and may be generalizable to other programs and institutions.

Keywords: *Clinical competence; Competency-based education; Paediatrics; Residency; Rotation.*

Transition from medical school to residency is stressful (1–5). Gaps in knowledge and skills among residents graduating from clerkship have been identified as potential causes (6). The first year of residency is the most challenging for trainees. Some medical schools have successfully incorporated clinically oriented rotations in an effort to improve student confidence, prepare for integration to clinical settings and reduce stress and anxiety associated with transition (7–10). Bandura et al. have demonstrated that self-confidence influences learning and performance (11).

In 2012, we surveyed junior and senior residents in our program ($n=46$) about their adaptation to paediatric residency. We obtained 35 survey responses (76.1%). A third of residents identified various transition difficulties. Two-thirds of residents agreed with the need for a new immersion rotation, providing 30% to 50% theory versus 70% to 50% clinical duties. A transition rotation could be useful to recall prior knowledge; assist residents in distinguishing between normality and pathology, improve exposure to paediatric topics prior to responsibilities and reduce stress. However,

the choice of relevant educational topics to include in these rotations remains unclear (12).

We hypothesized that a mandatory transition rotation would result in improving resident confidence in their abilities to assess and manage paediatric patients, leading them to feel better prepared for new responsibilities. To our knowledge, literature on resident transition remains quite sparse (8,13–15) and there are no published studies on paediatric resident self-confidence at the beginning of residency.

The aim of this study was to evaluate this unique Canadian immersion rotation, particularly the transition from medical school to paediatric residency, and to examine its implications for future use in paediatric education.

Methods

Study design

A cross-sectional study was conducted at the paediatric department of a large tertiary care mother–child academic centre receiving 11 to 13 new paediatric residents each year. Institutional Ethics Review Board approved this project for research and publication. Residents were informed that their participation was voluntary and anonymous. Informed consent was provided prior to data collection.

Cohort

Our target group was new postgraduate year 1 residents (PGY-1).

Immersion rotation structure

In July 2013, PGY-1 residents in our paediatric residency program participated in a mandatory new transition and orientation 4-week rotation during the first month of training. Prior to preparing and conceiving the curriculum for this rotation, a needs assessment was done. This consisted of gathering previous resident surveys from our program reflecting on the perceived needs of residents when adapting to paediatric residency. Subsequently, a committee composed of clinical faculty members and residents established explicit goals, learning objectives and activities. Objectives were based on knowledge, skills, abilities and CanMEDS core competencies (16). The goal of this curriculum was to prepare residents and to ease transition from medical school to residency. The immersion rotation included: lectures, workshops and visits to different services (19 sessions), clinical activities (9 sessions), night floats during weekends, free study sessions, in-training examination from the American Board of Pediatrics (17), Advanced Cardiovascular Life Support Certification (ACLS) (18), a 1 day introduction to the rotations in neonatology and a one day course from the Canadian Neonatal Resuscitation Program (NRP) (19), various orientation meetings with senior and junior residents, with staff and with the Paediatric Department Chair.

The competency-based curriculum consisted of teaching sessions, which included paediatric content and critical ethical, professional and communication skills expected of residents at the start of residency. Instructors from our centre delivered instruction using interactive didactics, small group discussions and simulation modules. Clinical activities took place in full days on wards, general paediatric and specialized ambulatory clinics, the emergency department, the consultation service, adolescent and social paediatric clinics. The paediatric program director provided information about the program and its objectives and described the resident instruction handout, resident safety standards and how to begin and maintain a portfolio.

Each participant provided constructive qualitative feedback to each tutor and evaluated the content of the program.

Pre- and postrotation self-assessments

Preimmersion confidence surveys were administered to participants on the first day of the rotation. Questionnaires containing the same self-confidence questions were re-issued on the last day of the intervention to rate the educational benefit of this immersion rotation. All surveys were anonymous.

All items were scored on a 5-point Likert scale: 1=extremely nonconfident to 5=quite confident. The main investigator recorded data from questionnaires using a standard data collection sheet (Excel software 2011 for MAC version 14.4.5 [141003]). Demographic information was gathered. Two authors from the current study conceived seven scripted clinical case-scenarios with corresponding questions: neonatology-related topics, respiratory distress, seizure, coma, cardiogenic shock, trauma and metabolic emergencies. Criteria for selecting topics included relevance, frequency and representation of general and common diseases. There were two open-ended questions about holistic paediatrics and general comments. We also evaluated abilities in healthy childcare, the paediatric physical exam, common paediatric diseases, medical emergencies, drugs, quality of prescriptions and communication skills.

Statistical analysis

We compared results of self-reported knowledge and confidence scores between pre- and postsurveys. Descriptive statistics included means, medians and standard deviations for topics and abilities data ranked on Likert scales. Differences for ordinal data were analyzed using a Mann–Whitney U test. A P value ≤ 0.05 was considered significant. All statistical analyses were performed using GraphPad Prism version 5.00 for Windows (San Diego, CA).

RESULTS

There was a 100% participation rate. Three residents were excluded from the analysis: one first year paediatric resident who

had completed 1 year as a PGY-1 resident in the family medicine program, two PGY-1 residents enrolled in the paediatric neurology and genetic programs for which their core first-year training was in general paediatrics during the same academic year. We analyzed data from 11 PGY-1 residents beginning their paediatric residency on July 1, 2013. Demographic characteristics of participants are outlined in [Table 1](#). All residents had previously completed elective clinical rotations in General Paediatrics during medical school training in addition to two mandatory rotations common to all medical students as part of their core curriculum.

Pre- and postimmersion confidence levels rating resident competencies and abilities for various paediatric topics are presented in [Table 2](#). Significant differences were noted in areas of neonatology ($P<0.001$), respiratory distress cases ($P=0.01$) and seizure management skills ($P<0.001$). Among abilities surveyed, significant differences were noted for medical emergencies ($P<0.001$) and drug prescriptions ($P<0.002$). The healthy childcare item was the only topic with decreased participant self-confidence levels. Overall, 45.5% of participants from the immersion group felt confident and ready to start clinical rotations in the paediatric program following completion of the immersion rotation.

We also collected qualitative general comments and suggestions at the start and following the immersion rotation. A few residents stated: "Knowing we had this immersion class decreased my anxiety to begin residency"; "this rotation permits us to create friendships and form a team"; "it helps to decrease stress a lot"; "I really appreciated

the general exposure we had in various departments"; "this rotation is really appreciated, and should be included in every program"; "a rotation that allows us to adapt to our new environment and to ultimately maximize learning during subsequent rotations".

Ten participants expressed their desire to be exposed to more clinics and even complete more night floats. Overall, residents felt that the immersion rotation was a valuable experience. According to the program director in office for the last 6 years, junior residents have been performing very well. Indeed, since the immersion program was implemented in 2013, there have been no reports of difficulties in adapting during the first-year of residency. Moreover, PGY-1 paediatric resident cohorts have consistently reported a satisfaction rate of 100% toward the program, and faculty surveys have reported better trainee integration to residency since the program's creation.

DISCUSSION

Transition rotations described in the literature vary in length (4,20). We decided to include a variety of paediatric domains, strategies to cope with stressors and enhance communication skills. Few transition rotations between preclinical training to clinical years explicitly state their purpose and learning objectives, and some authors have recommended that such curricula be structured and guided by peers and program directors (8). Thus, we constructed a 4-week rotation based on a previous needs assessment from paediatric residents and the expertise of the faculty committee.

Table 1. Characteristics of resident participants

		Intervention group n=11
Medical School	McGill University	2
	University of Montreal	6
	Others	3
Gender	Female	10
	Male	1
Age (years)	20–25	8
	26–30	3
Clerkship elective rotations in General Paediatrics (months)*	1	1
	2	9
	≥3	1
Clerkship elective rotations in Paediatrics Subspecialty (months)*	1	1
	2	7
	≥3	3
Education level prior to entering medical school	University-Undergraduate	2
	CEGEP**	9
Residency Program	Paediatrics	11
	Subspecialty	0

*Elective rotations prior to starting residency, in addition to the mandatory rotations; **CEGEP (College of General and Vocational Education), 2 years postsecondary diploma

Table 2. Confidence levels of residents with an immersion rotation

		Intervention Group						P
		Prerotation			Postrotation			
		n=11			n=11			
		Median	Mean	SD*	Median	Mean	SD*	
<i>Topics</i>	Neonatology	1	1.36	0.50	3	3.36	0.81	0.0002
	Respiratory Distress	3	2.09	0.60	4	3.73	0.65	0.01
	Seizure	2	2.27	0.65	3	3.45	0.52	0.0002
	Coma	2	1.95	0.87	3	2.73	0.47	0.18
	Cardiogenic Shock	2	2.14	0.83	3	2.73	0.65	0.11
	Trauma	2	2.05	0.63	3	2.64	0.81	0.07
	Metabolic Emergency	2	2.18	0.92	3	2.82	0.87	0.35
<i>Abilities</i>	Healthy Child Care	3	3.18	0.40	3	2.82	0.60	0.22
	Paediatric Physical Exam	3	3.45	0.52	4	3.55	0.69	0.62
	Paediatric Diseases	3	3.18	0.60	4	3.55	0.69	0.20
	Medical Emergency	1	1.55	0.69	3	3.18	0.60	0.0004
	Drug prescription	2	2.45	0.52	3	3.18	0.60	0.002
	Test prescription	3	3.18	0.60	4	3.73	0.65	0.052
	Communication	4	3.55	0.52	4	3.91	0.70	0.72

*Standard deviation

Topics indicates knowledge questions; abilities indicates questions about abilities.

Stress and anxiety could be associated with feelings of poor knowledge during the transition period (8). Residents reported transition difficulties such as beginning training with paediatric specialty rotations rather than in general paediatrics, the impression that paediatric knowledge was distant, little time to study after a workday, overwhelming workload in a new environment accompanied by little teaching. The use of peer teaching or mentoring by senior residents may improve the well being of junior residents (8). In fact, we believe that collaboration between residents and faculty members may reduce anxiety and stress. Finally, our cohort reported that the immersion rotation consolidated relationships between junior trainees and built friendships, as they spent an entire 1-month period together, bonding and collaborating. Our curriculum is effective in contributing positively to resident confidence and preparedness. Indeed, an increase in confidence levels in several areas was observed following the immersion program. The majority of participants felt more prepared to begin residency. These findings correlate with those from previous studies (7,10,15). An immersion rotation may reinforce confidence in accomplishing certain tasks while identifying knowledge gaps which may assist trainees in orienting their focus and study.

An immersion rotation should help in enhancing maturity, self-reflection skills, professional development and communication skills (4). Despite the fact that merely 5 of 14 variables showed a significant change between pre- and post-testing, our residents felt that the rotation improved preparation and transition from medical school to residency; they become more confident and knowledgeable.

Participants unanimously recommended our immersion program to future residents, promoting its relevance in preparing for transition. Although developing such a rotation is time-consuming and labour intensive, our findings support the program's decision to pursue the rotation. Indeed, it has been formally incorporated into our curriculum and it is in continuous progress. Since implementation, PGY-1 paediatric resident cohorts have reported a satisfaction rate of 100%. The report of our research provides a framework that may be beneficial to educators who are involved in designing or directing transition rotations.

Limitations from our study concur with those found in studies reporting participant self-perception (Kirkpatrick Level 1) (21). It is possible that confidence levels are incongruent with the actual readiness of residents to perform certain tasks (Kirkpatrick level 2) (21). Biases were possibly introduced when asking trainees to rate their knowledge on certain topics. Residents may have overestimated their knowledge prior to the start of the rotation. Perhaps they only realized the amount of knowledge and the scope of skills expected of them by the end of their paediatric residency training. Although our residents had similar demographics and educational backgrounds, interpersonal variability exists among all participants that cannot be controlled. Because participants graduated from different medical schools, we believe that our findings could be generalizable. This was a cross-sectional study rather than a longitudinal study; we only ran a short-term survey for resident sense of readiness. Future research should focus on the impact and long-term durability of transition rotations to better orient training during residency. Although our sample size was small and statistical differences could not always be

achieved; residents seemed to show an improvement in self-confidence levels for almost all topics and competencies, and specifically in their sense of readiness to begin residency. As stated before, since confidence is possibly linked to performance, it could be speculated that resident performances may be enhanced following such a rotation (11). However, despite improvements in self-confidence levels, we did not explore resident competency or performance because this was not the primary objective of the study. This would certainly be interesting to explore in the future, through standardized evaluations.

CONCLUSION

This is the first innovative educational intervention; no other paediatric programs across Canada have similar introductory sessions. Our study demonstrates the benefits of implementing an introductory rotation to facilitate stressful transitions from medical school to paediatric PGY-1 residency. This rotation helped consolidate relationships between new residents. In addition, self-confidence levels of junior residents improved in several areas of paediatrics. Our results contributed to improving the content of the program over the years.

Future studies are needed to show whether our results are generalizable to other paediatric training programs. Our experience may serve as a model across various residency-training disciplines.

What's known on this subject: Some medical schools have incorporated oriented rotations to improve student confidence prior to clinical years.

What this study adds: Experience with a new rotation to ease the transition from clerkship to paediatric residency.

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Conflict of Interest: No conflict of interest to disclose by the authors.

Author Contributions

SV: Conceptualized and designed the study, collected data, carried out the analyses and drafted the initial manuscript. OJ, AL and AC: Conceptualized, designed the study and critically reviewed the manuscript. All authors approved the final manuscript as submitted and agreed to be accountable for all aspects of the work.

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