An Intensive Continuity Clinic Immersion Experience for Interns: A Springboard to Confidence and Satisfaction With Continuity Clinic

Maya Dulay, MD
Ryan Laponis, MD, MSci
Bridget C. O'Brien, PhD
Reena Gupta, MD
Radhika A. Ramanan, MD, MPH
Katherine Julian, MD

ABSTRACT

Background Providing a robust continuity clinic experience is difficult due to uneven distribution of resident time. Immersion experiences early in training may improve residents' learning experiences.

Objective We designed and implemented a continuity immersion experience to improve internal medicine interns' satisfaction and confidence with their outpatient skills, and we evaluated the timing of the experience and its benefits for learners.

Methods Two cohorts of interns at 1 academic institution participated in a 3-week immersion block (during the first or second quarter of the intern year). Interns were surveyed twice about satisfaction and confidence. Analysis included independent and paired sample *t* tests to compare interns' responses pre- and postimmersion, and to evaluate effects over time.

Results A total of 124 interns completed the immersion, with a survey response rate of 61%. Interns' self-rated confidence on a 5-point Likert scale improved significantly compared with preimmersion in the areas of medical knowledge and confidence with their electronic health record and communication skills ($P \leq .010$ for all assessments). Interns reported high satisfaction with continuity clinic following immersion (cohort 1: 4.5 $\pm$ 0.54; cohort 2: 4.3 $\pm$ 0.68; on a 5-point scale with 5 = very satisfied). Improvements in knowledge, skills, and satisfaction in cohort 1 were sustained over 3 months.

Conclusions A 3-week immersion experience in the first 6 months of residency improved interns' confidence in ambulatory content areas and satisfaction with clinic.

Introduction

Challenges to providing robust training in ambulatory medicine through continuity clinic are well documented. Systems, resources, and learning environments for resident clinics are highly variable and complex,[1,2] leading some to describe clinical learning environments as dysfunctional.[3] Interns enter residency with uneven skill sets and variable exposure to outpatient medicine,[4] which is an additional challenge to efforts to develop effective curricula.

In some specialties, the balance of training time is skewed toward inpatient activities.[5,6] A 2006 study reported that internal medicine residents spend less than 10% of their total training time in continuity clinic.[7] Correspondingly, residency programs must find ways to maximize learning in the ambulatory environment. Studies have suggested that brief learning experiences (1–5 days), such as orientations and boot camps, can effectively prepare learners to function at a basic skill level and improve confidence early in training.[8–10]

DOI: http://dx.doi.org/10.4300/JGME-D-16-00696.1

Editor's Note: The online version of this article contains the table identifying specific curricular elements delivered over the 3-week immersion block.

We tested whether an early clinic immersion experience would increase intern satisfaction and confidence in continuity clinic and ambulatory clinical content, and whether these effects would be sustained over time. We also assessed whether the timing during internship (first quarter versus second quarter) affected this satisfaction and confidence.

Methods

Research Setting and Participants

The University of California, San Francisco, Internal Medicine Residency is a multisite, urban program with 186 categorical and primary care track residents. All interns participated in a 3-week immersion block from June 2014 through January 2016 at their clinic site, based either at a university, a Veterans Affairs facility, or a county hospital. Outside of the intervention, interns had a traditional half-day per week clinic schedule throughout the year. Core clinic faculty, health care providers, and chief residents delivered the curriculum at the 3 sites.

We studied 2 cohorts of interns: cohort 1 completed immersion in the first quarter of the academic year (July to September); cohort 2 completed immersion in the second quarter (October to December). Each clinic site ran 1 immersion block during each quarter.

Intervention

Prior to implementation of the intervention, residency leadership, clinic directors, and faculty with expertise in curricular development agreed on the curricular activities and learning objectives. Using workplace learning as a guiding framework, at each clinic site we adapted, rearranged, and developed new learning experiences that addressed task, relational, and practice factors[11,12]:

1. Task/activity factors: opportunities for interns to shadow faculty and senior residents in clinic, and ambulatory didactics to increase medical knowledge of common primary care conditions and diseases;
2. Relational factors: dedicated time to develop relationships with clinical teams and outpatient mentors;
3. Practice factors: interactive didactics focused on enhancing effective team-based care, including navigation of clinic systems, charting effectively in an electronic health record (EHR), telephone and electronic communication with patients, and panel management; and
4. Integration of the 3 factors with practice in the continuity clinic, which involved 3 half-days each week.

Interns spent the full 3 weeks immersed in continuity clinic–related activities. Details of curricular activities are available as online supplemental material.

Evaluation of Outcomes

We used a locally developed survey to assess interns' experiences with the immersion block. One author (K.J.) consulted with 2 educational researchers with expertise in survey design. The survey was reviewed by faculty for clarity, and minor revisions were made after an initial first pilot year. No further testing was performed. Survey items were based on intern immersion learning objectives to evaluate interns' confidence in their outpatient knowledge and clinical skills (5-point Likert scales from 1, strongly disagree, to 5, strongly agree), their satisfaction with immersion-specific activities and didactic topics (1, poor, to 5, outstanding), and their overall satisfaction with clinic (1, very dissatisfied, to 5, very satisfied).

All interns received anonymous electronic surveys once each quarter, regardless of when they completed their immersion (survey 1 and survey 2). Survey 1 was a postimmersion survey for cohort 1 and was a preimmersion survey for cohort 2. Survey 2 was administered when cohort 2 had completed immersion and was a 3-month postimmersion survey for cohort 1, thereby measuring retention of immersion effects. In addition, participants completed questions regarding immersion-specific activities immediately after completing immersion.

What was known and gap
Providing medical interns with a meaningful introduction to the ambulatory setting is challenging, and there is a need for validated models.

What is new
A 3-week continuity immersion experience to improve internal medicine intern satisfaction and confidence with outpatient skills, with assessment of benefits for the learners.

Limitations
Single site study; survey instruments lacks validity evidence.

Bottom line
A 3-week immersion experience in the first 6 months of training improved interns' confidence in ambulatory content areas and satisfaction with clinic.

The study was approved by the Committee on Human Research at the University of California, San Francisco.

For analysis, we grouped similar survey items into the categories of EHR skills and communication. We used independent sample *t* tests to compare cohort 1 and cohort 2 survey responses and paired sample *t* tests to compare responses from interns who completed both surveys (cohort 2 pre- and postimmersion, and cohort 1 immediately postimmersion and 3 months postimmersion). We set significance at $\alpha = .01$ because we made multiple comparisons, and we calculated effect sizes to provide an indication of the magnitude of the difference (ie, substantive significance) between groups.[13–15]

Results

A total of 124 interns completed the immersion experience. A total of 51% (63 of 124) were women, and 29% (36 of 124) were in the primary care track. The response rate for survey 1 was 73% (91 of 124), the rate for survey 2 was 49% (61 of 124), and 42% (52 of 124) of interns responded to both surveys.

Evaluation of Immersion Components

Interns rated the overall educational value of the immersion experience at 4.1 out of 5 (SD ± 0.83), with no significant differences between cohort 1 and cohort 2. A total of 76% felt the appropriate amount of time was spent on each curricular activity.

Cohort 1 interns had significantly higher confidence in all core content areas, and higher

TABLE 1
Comparing Cohort 1 Postimmersion With Cohort 2 Preimmersion to Evaluate Effect of Immersion Participation

Survey Items[a]	Cohort 1 Immediately Postimmersion		Cohort 2 Preimmersion		Independent Sample *t* Tests, *P* Value[b]	Cohen's *d* Effect Size
	No.	Score, Mean (SD)	No.	Score, Mean (SD)		
Outpatient medical knowledge (1 item)	56	3.5 (0.60)	33	2.6 (0.65)	< .001	1.45
EHR skills (2 items)	56	4.2 (0.56)	33	3.6 (0.75)	.001	0.94
Communication during and after visit (4 items)	56	3.9 (0.47)	33	3.4 (0.55)	< .001	1.00
Please rate your overall satisfaction with your continuity clinic (1, very dissatisfied, to 5, very satisfied)	56	4.5 (0.54)	35	3.7 (0.85)	< .001	1.18

Abbreviation: EHR, electronic health record.
[a] 5-point Likert scale: 1, strongly disagree, to 5, strongly agree.
[b] $\alpha = .01$.

satisfaction with clinic immediately following immersion compared with their preimmersion peers. Effect sizes were large, ranging from 0.94 to 1.45 (TABLE 1). Confidence related to medical knowledge was 3.5 ± 0.60 versus 2.6 ± 0.65 of 5; EHR skills confidence was 4.2 ± 0.56 compared with 3.6 ± 0.75, and confidence with communication skills was 3.9 ± 0.47 versus 3.4 ± 0.55 (all $P \leq .001$). All ratings were on a 5-point scale (1, strongly disagree, to 5, strongly agree). Cohort 2 interns who completed preimmersion and postimmersion surveys (n = 23) also rated improvement in all areas after participating in immersion. Effect sizes were large, ranging from 0.77 to 1.21 (TABLE 2). Interns rated their satisfaction with clinic immediately following immersion very highly, with cohort 1 rating it 4.5 (SD ± 0.54), and cohort 2 rating it 4.2 (SD ± 0.77).

We compared the postimmersion survey responses of the interns who completed immersion during the first quarter of the year (cohort 1) and those who completed it in the second quarter (cohort 2), and found no statistically significant differences.

Sustainability of Immersion Effects

We compared cohort 1 responses to both surveys in order to assess the sustainability of immersion effects over a 3-month period (n = 27). We found no significant differences in interns' confidence in their medical knowledge and their EHR and communication skills. Overall satisfaction with clinic also remained high at (4.1, $P = .017$).

Discussion

A 3-week clinic immersion experience improved intern confidence in core ambulatory content areas, as well as satisfaction with clinic. These improvements were maintained at least 3 months after the immersion. To our knowledge, this is the only published study detailing the effect of an intern immersion continuity clinic experience.

Designing immersion as a 3-week experience, rather than a typical 1- to 5-day orientation, provided a more realistic time frame for interns to acclimate to the complex tasks, relationships, and systems of their continuity clinic. Despite early gains by cohort 1, we found no statistically significant differences between

TABLE 2
Comparing Cohort 2 Interns Pre- and Postimmersion to Evaluate Effect of Immersion

Survey Items[a]	No.	Preimmersion Score, Mean (SD)	Postimmersion Score, Mean (SD)	Paired Sample *t* Test, *P* Value[b]	Effect Size, *d* Calculated From *t* Statistic
Outpatient medical knowledge (1 item)	23	2.7 (0.70)	3.5 (0.67)	< .001	1.21
EHR skills (2 items)	22	3.7 (0.78)	4.4 (0.52)	.001	1.16
Communication during and after visit (4 items)	23	3.5 (0.54)	4.0 (0.59)	.008	0.77
Please rate your overall satisfaction with your continuity clinic (1, very dissatisfied, to 5, very satisfied)	25	3.8 (0.93)	4.3 (0.68)	.006	0.63

Abbreviation: EHR, electronic health record.
[a] 5-point Likert scale: 1, strongly disagree, to 5, strongly agree.
[b] $\alpha = .01$.

the 2 cohorts at the midyear point when both groups had completed immersion.

Faculty time is needed to develop and deliver this curriculum, particularly in the inaugural year. The immersion effort took a calendar year to plan, and coordinating the interns' schedules to allow them the ambulatory time to attend immersion was the most challenging aspect. Resources such as examination room space, precepting time, and availability of staff for shadowing activities are needed for the influx of interns. Having a more satisfied and more highly functional intern group is a key point for negotiations to secure resources.

Our study has limitations. We relied heavily on data from a survey that lacked evidence of validity, and respondents may have interpreted questions in a variety of ways. Since this was a single institution study, generalizability to other programs may be limited. Survey 2 had a lower response rate, which limits the power of our within-subject comparisons. We focused on interns' confidence and satisfaction, and we did not collect data on observed skills or patient outcomes. We cannot identify which specific aspects of the curriculum were most influential, nor how much interns' confidence would improve over time without immersion.

Important next steps for research include direct observation of interns' EHR and communication skills over time (preimmersion, postimmersion, and several months postimmersion) to allow us to more rigorously evaluate curricular components, timing of the immersion, and sustainability of immersion effects.

Conclusion

Our study demonstrated that a 3-week clinic immersion block improved interns' confidence and satisfaction with clinic experience in the context of a complex clinic environment and limited training time.

References

1. Nadkarni M, Reddy S, Bates CK, et al. Ambulatory-based education in internal medicine: current organization and implications for transformation. Results of a national survey of resident continuity clinic directors. *J Gen Intern Med*. 2011;26(1):16–20.
2. Francis MD, Thomas K, Langan M, et al. Clinic design, key practice metrics, and resident satisfaction in internal medicine continuity clinics: findings of the educational innovations project ambulatory collaborative. *J Grad Med Educ*. 2014;6(2):249–255.
3. Keirns CC, Bosk CL. Perspective: the unintended consequences of training residents in dysfunctional outpatient settings. *Acad Med*. 2008;83(5):498–502.
4. Wiest FC, Ferris TG, Gokhale M, et al. Preparedness of internal medicine and family practice residents for treating common conditions. *JAMA*. 2002;288(20):2609–2614.
5. Holmboe ES, Bowen JL, Green M, et al. Reforming internal medicine residency training. A report from the Society of General Internal Medicine's task force for residency reform. *J Gen Intern Med*. 2005;20(12):1165–1172.
6. McBurney PG, Moran CM, Ector WL, et al. Time in continuity clinic as a predictor of continuity of care for pediatric residents. *Pediatrics*. 2004;114(4):1023–1027.
7. Association of Program Directors in Internal Medicine, Fitzgibbons JP, Bordley DR, et al. Redesigning residency education in internal medicine: a position paper from the Association of Program Directors in Internal Medicine. *Ann Intern Med*. 2006;144(12):920–926.
8. Blackmore C, Austin J, Lopushinsky SR, et al. Effects of postgraduate medical education "boot camps" on clinical skills, knowledge, and confidence: a meta-analysis. *J Grad Med Educ*. 2014;6(4):643–652.
9. Esch LM, Bird AN, Oyler JL, et al. Preparing for the primary care clinic: an ambulatory boot camp for internal medicine interns. *Med Educ Online*. 2015;20(1):29702.
10. Rybolt AH, Staton LJ, Panda M, et al. Achieving the AAAs of ambulatory care: aptitude, appeal, and appreciation. *J Grad Med Educ*. 2009;1(1):155–161.
11. Australian Learning and Teaching Council. Guidelines for practice: integrating practice-based experiences. https://www.mendocino.edu/sites/default/files/docs/work-experience/Guidelines_Integrating_Practice_Based_Experiences_ALTC_9-11.pdf. Accessed August 7, 2017.
12. O'Brien BC, Poncelet AN. Transition to clerkship courses: preparing students to enter the workplace. *Acad Med*. 2010;85(12):1862–1869.
13. Sullivan GM, Feinn R. Using effect size—or why the P value is not enough. *J Grad Med Educ*. 2012;4(3):279–282.
14. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Hillsdale, NJ: Erlbaum; 1988.
15. Dunlap WP, Cortina JM, Vaslow JB, et al. Meta-analysis of experiments with matched groups or repeated measures designs. *Psychol Methods*. 1996;1:170–177.

Maya Dulay, MD, is Associate Professor, Department of Medicine, University of California, San Francisco, and Associate Director, Center of Excellence in Primary Care Education, San Francisco Veterans Affairs Health Care System; **Ryan Laponis, MD, MSci,** is Assistant Professor, Department of Medicine, University of California, San Francisco; **Bridget C. O'Brien, PhD,** is Associate Professor, Department of Medicine, and Educational Researcher, Center for Faculty Educators, University of California, San Francisco; **Reena Gupta, MD,** is Assistant Professor, Department of Medicine, University of California, San Francisco, and Zuckerberg San Francisco General Hospital; **Radhika A.**

Ramanan, MD, MPH, is Professor, Department of Medicine, University of California, San Francisco; and **Katherine Julian, MD,** is Professor, Department of Medicine**,** University of California, San Francisco.

Funding: The authors report no external funding source for this study.

Conflict of interest: The authors declare they have no competing interests.

The authors would like to thank Shilpa Shah, MD; Jessica Beaman, MD; and Patricia O'Sullivan EdD.

Corresponding author: Maya Dulay, MD, San Francisco VA Medical Center, 4150 Clement Street, San Francisco, CA 94121, 415.221.4810, maya.dulay@va.gov

Received November 7, 2016; revisions received March 9, 2017, and June 9, 2017; accepted June 13, 2017.