

# Trainees' Perceptions of the Transition From Medical School to Residency

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## ABSTRACT

**Background** There is emerging evidence that learners may be suboptimally prepared for the expectations of residency. In order to address these concerns, many medical schools are implementing residency preparation courses (RPCs).

**Objective** We aimed to determine trainees' perceptions of their transition to residency and whether they felt that they benefited from participation in an RPC.

**Methods** All residents and fellows at the University of Michigan ( $n = 1292$ ) received an electronic survey in July 2018 that queried respondents on demographics, whether medical school had prepared them for intern year, and whether they had participated in an RPC.

**Results** The response rate was 44% (563 of 1292) with even distribution across gender and postgraduate years (PGYs). Most (78%, 439 of 563) felt that medical school prepared them well for intern year. There were no differences in reported preparedness for intern year across PGY, age, gender, or specialty. Overall, 28% (156 of 563) of respondents participated in an RPC and endorsed feeling prepared for intern year, which was more than RPC non-participants (85% [133 of 156] vs 70% [306 of 439],  $P = .029$ ). Participation in longer RPCs was also associated with higher perceived preparedness for residency.

**Conclusions** This study found that residents from multiple specialties reported greater preparedness for residency if they participated in a medical school fourth-year RPC, with greater perceptions of preparedness for longer duration RPCs, which may help to bridge the medical school to residency gap.

## Introduction

The transition from medical student to resident is characterized by a marked increase in responsibilities and clinical care demands.<sup>1,2</sup> Residency program directors from diverse specialties perceive that their first-year residents are suboptimally prepared for the expectations of residency.<sup>3,4</sup> There is also emerging evidence that the strain of this transition may contribute negatively to learner well-being, with increases in learner burnout and suicide risk during the first months of residency.<sup>5</sup>

In order to address these concerns, many medical schools have developed residency preparation courses (RPCs) for fourth-year students.<sup>6-8</sup> RPCs vary widely in terms of course length, skills, and content.<sup>9</sup> While there is ample literature that RPCs effectively increase confidence and skills in the short term (ie, immediately post-course<sup>7</sup>), few studies have examined the lasting impact that RPCs have during residency.

Our objective was to determine whether residents and fellows from multiple specialties felt prepared for their intern year, and whether they perceived that they benefited from participation in an RPC. We anticipated that residents who completed an RPC entered intern year feeling prepared more often than those who did not participate.

## Methods

### Setting and Participants

We sent all residents and fellows at the University of Michigan (UM) an anonymous 15-question electronic survey. The survey was sent a total of 4 times over 6 weeks from July to August 2018.

### Intervention

Survey design involved using local content experts to adapt similar surveys that pertained to the fourth year of medical school and the transition from medical school to residency,<sup>1,10,11</sup> contributing to content validity. We reviewed published resident surveys.<sup>12</sup> Multiple rounds of piloting with faculty directors of the RPCs (D.T.H., J.S., L.A.H.) and residents at UM led to revisions, with an eye to optimizing response process validity.

DOI: <http://dx.doi.org/10.4300/JGME-D-20-00183.1>

**Editor's Note:** The online version of this article contains the survey used in the study and a table of the representations of survey respondents.

## Outcomes Measured

Respondents reported their age, gender, residency specialty, and current postgraduate year (PGY). The complete survey, as well as respondent demographics, is included as supplemental material. Specialties were grouped as non-procedural and procedural as previously described in the literature.<sup>3</sup>

The primary outcome was perceived preparedness for intern year, assessed with the prompt, "In hindsight, my medical school prepared me well for intern year," on a 5-point Likert scale (strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree). For analysis, responses were categorized into 3 groups: Disagree (disagree or strongly disagree), Neither (neither agree nor disagree), and Agree (agree or strongly agree). Participants were asked if their medical schools offered an RPC, if they had participated in the RPC, and the length of the course.

## Analysis

All variables were summarized using descriptive statistics such as frequencies and proportions. Comparisons were made between the Disagree and Agree preparedness categories across different demographic factors using chi-square test or Fisher's exact test. Neither responses were not included in the comparison. All data management and analyses were performed using SAS Version 9.4 (SAS Institute Inc, Cary, NC), and a *P* value < .05 was used to indicate statistical significance.

The UM Institutional Review Board deemed this study exempt.

## Results

The survey response rate was 44% (563 of 1292), distributed evenly across PGYs, with a representative specialty distribution of the trainees at UM. Among the 563 respondents, 283 identified as male (50%), 273 (48%) identified as female, and 7 (1%) did not respond. There were 215 respondents (38%) from procedural specialties, 333 respondents (59%) from nonprocedural specialties, and 15 respondents (3%) who did not list a specialty. A total of 439 respondents (78%) agreed with the statement that medical school prepared them well for intern year (strongly agree: 134 of 563 [24%] or agree: 305 of 563 [54%]), 73 of 563 (13%) neither agreed nor disagreed, and 51 of 563 (9%) disagreed (strongly disagree: 7 of 563 [1%] or disagree: 44 of 563 [8%]). A post-hoc power calculation showed a sample size of 14 (7 per group) was needed to detect a 69% difference in preparedness scores, with 80% power

and 95% 2-tailed confidence intervals. There were no differences in feeling prepared across age, gender, PGY, or specialty (TABLE).

Overall, 226 respondents (40%) reported that an RPC was offered at their medical school, and 156 (28%) of all respondents participated in an RPC, which varied in length from less than 1 week to longer than 4 weeks. RPC participants reported feeling prepared more frequently than RPC non-participants (85% [133 of 156] vs 70% [306 of 439]; *P* = .029). Participation in longer RPCs was also associated with higher perceived preparedness for residency (TABLE).

## Discussion

Our study offers insight into self-perceived preparedness of residents from multiple specialties on their transition from medical school to residency. Residents who participated in an RPC felt more prepared for this transition; this effect was driven by those who participated in an RPC of longer duration.

These findings are consistent with single specialty studies that have examined first-year residents' self-perceptions about preparedness for intern year. In a 2009 study of 158 general surgery interns, respondents felt moderately prepared for the patient care and medical knowledge domain responsibilities.<sup>1</sup> Similar to our findings, the general surgery interns in their study who participated in a fourth-year RPC felt better prepared. Our respondents represented a broad spectrum of specialties, with consistent findings of higher perceived preparedness among those reporting an RPC in the fourth year of medical school. It is essential to note that *feeling* prepared and *being* prepared are not necessarily related,<sup>13</sup> and the ideal fraction of what percentage of learners should feel prepared for this transition has never been defined. More importantly, future studies will need to investigate whether the residents who did not feel prepared were indeed suboptimally prepared for this transition. Nevertheless, there are important curricular implications of our findings across the medical education continuum.

RPCs are becoming increasingly common in medical schools and require a significant allocation of time and resources.<sup>14</sup> Our data provide preliminary rationale for medical schools to consider investing in courses of longer duration, which may provide more opportunities to implement meaningful individualized assessments<sup>15</sup> that better prepare students for the expectations of residency.

This survey is limited in generalizability because it is from one allopathic institution. The survey response rate was about half of those eligible, which may have introduced bias. In addition, recall bias may

TABLE

Characteristics of Survey Participants by Self-Reported Preparedness for Intern Year

Characteristic	In Hindsight, My Medical School Prepared Me Well for Intern Year, n (%) <sup>a</sup>				P Value <sup>b</sup>
	Total (N = 563)	Disagree (n = 51)	Neither (n = 73)	Agree (n = 439)	
Level of training					
PGY-1	120 (21)	14 (12)	22 (18)	84 (70)	
PGY-2	117 (21)	8 (7)	12 (10)	97 (83)	
PGY-3	112 (20)	8 (7)	11 (10)	93 (83)	
PGY-4	86 (15)	8 (9)	13 (15)	65 (76)	
PGY-5+	127 (23)	13 (10)	15 (12)	99 (78)	
Age group					
< 30	289 (51)	23 (8)	37 (13)	229 (79)	
30–34	234 (42)	23 (10)	32 (14)	179 (77)	
35+	39 (7)	5 (13)	3 (8)	31 (80)	
Gender					
Male	283 (51)	21 (7)	38 (13)	224 (79)	
Female	273 (49)	3 (11)	34 (47)	209 (77)	
Residency specialty					
Procedural	215 (39)	19 (9)	22 (10)	174 (81)	
Non-procedural	333 (61)	30 (9)	47 (14)	256 (77)	
Preliminary or transitional year					
Yes	105 (19)	9 (9)	18 (17)	78 (74)	
No	458 (81)	42 (9)	55 (12)	361 (79)	
Did your medical school offer a bootcamp?					
Yes	226 (40)	11 (5)	22 (10)	193 (85)	
No	337 (60)	40 (12)	51 (15)	246 (73)	
Did you participate in the bootcamp?					
Yes	156 (28)	8 (5)	15 (10)	133 (85)	
No	407 (72)	43 (11)	58 (14)	306 (70)	
How long was the course?					
Less than 1 week	12 (9)	1 (8)	3 (25)	8 (67)	
One week	18 (14)	3 (17)	2 (11)	13 (72)	
Two weeks	32 (24)	2 (6)	5 (16)	25 (78)	
Three weeks	1 (1)	0 (0)	0 (0)	1 (100)	
Four weeks or more	70 (53)	0 (0)	3 (4)	67 (96)	

<sup>a</sup> Data in *Total* column are presented as column percentages, and data in *Disagree*, *Neither*, and *Agree* columns are presented as row percentages. Frequencies may not add to column total due to missing data.

<sup>b</sup> Disagree vs agree.

<sup>c</sup> Fisher's exact test.

Abbreviation: PGY, postgraduate year.

have altered responses for advanced level residents. We distributed the survey in July, which may be a stressful time, with unknown effects on resident responses. We did not ask respondents which medical school they attended, which could be a confounder, as many residents completed medical school at UM and participated in an RPC that was 4 weeks long. This may have led to an overrepresentation of graduates from our institution. Additionally, we did not further query respondents who elected not to enroll in an RPC at their institution about their rationale. Most

importantly, we did not link these anonymous responses to resident performance assessments.

Future work will need to investigate whether residents who feel unprepared are also assessed as such during their residency training. Examination of specific RPC components, including whether components are tailored to student career plans, would also be useful.

## Conclusions

This study found that residents from multiple specialties reported greater preparedness for residency

if they participated in a medical school fourth-year RPC, with greater perceptions of preparedness for longer duration RPCs. In general, most residents felt that the medical school they attended prepared them for residency.

## References

1. Minter RM, Amos KD, Bentz ML, Blair PG, Brandt C, D'Cunha J, et al. Transition to surgical residency: a multi-institutional study of perceived intern preparedness and the effect of a formal residency preparatory course in the fourth year of medical school. *Acad Med.* 2015;90(8):1116–1124. doi:10.1097/ACM.0000000000000680.
2. Brownfield E, Wong JG, Blue AV. Transition to residency: the “internship 101 experience”. *Am J Med Sci.* 2016;352(2):215–217. doi:10.1016/j.amjms.2016.05.019.
3. Lyss-Lerman P, Teherani A, Aagaard E, Loeser H, Cooke M, Harper GM. What training is needed in the fourth year of medical school? Views of residency program directors. *Acad Med.* 2009;84(7):823–829. doi:10.1097/ACM.0b013e3181a82426.
4. Hauff SR, Hopson LR, Losman E, Perry MA, Lypson ML, Fischer J, et al. Programmatic assessment of level 1 milestones in incoming interns. *Acad Emerg Med.* 2014;21(6):694–698. doi:10.1111/acem.12393.
5. Yaghmour NA, Brigham TP, Richter T, Miller RS, Philibert I, Baldwin DC Jr, et al. Causes of death of residents in ACGME-accredited programs 2000 through 2014: implications for the learning environment. *Acad Med.* 2017;92(7):976–983. doi:10.1097/ACM.0000000000001736.
6. American College of Surgeons. ACS/APDS/ASE Resident Prep Curriculum. <https://www.facs.org/education/program/resident-prep>. Accessed August 28, 2020.
7. Germann CA, Strout TD, Park YS, Tekian A. Senior-year curriculum in U.S. medical schools: a scoping review. *Teach Learn Med.* 2020;32(1):34–44. doi:10.1080/10401334.2019.1618307.
8. Blackmore C, Austin J, Lopushinsky SR, Donnon T. 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. doi:10.4300/JGME-D-13-00373.1.
9. Association of American Medical Colleges. Curriculum Reports. <https://www.aamc.org/initiatives/cir/484940/38.html>. Accessed August 28, 2020.
10. Wolf SJ, Lockspeiser TM, Gong J, Guiton G. Students' perspectives on the fourth year of medical school: a mixed-methods analysis. *Acad Med.* 2014;89(4):602–607. doi:10.1097/ACM.0000000000000183.
11. Pereira AG, Harrell HE, Weissman A, Smith CD, Dupras D, Kane GC. Important skills for internship and the fourth-year medical school courses to acquire them: a national survey of internal medicine residents. *Acad Med.* 2016;91(6):821–826. doi:10.1097/ACM.0000000000001134.
12. Guntupalli SR, Doo DW, Guy M, Sheeder J, Omurtag K, Kondapalli L, et al. Preparedness of obstetrics and gynecology residents for fellowship training. *Obstet Gynecol.* 2015;126(3):559–568. doi:10.1097/AOG.0000000000000999.
13. Kruger J, Dunning D. Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments. *J Pers Soc Psychol.* 1999;77(6):1121–1134. doi:10.1037/0022-3514.77.6.1121.
14. American Board of Surgery, American College of Surgeons, Association of Program Directors in Surgery, Association for Surgical Education. Statement on surgical pre-residency preparatory courses. *JAMA Surg.* 2014;149(11):1198–1199. doi:10.1016/j.jtsurg.2014.05.010.
15. Skinner B, Morgan H, Kobernik E, Kamad N, Curran D, Marzano D, et al. The decision to incision curriculum: teaching preoperative skills and achieving Level 1 Milestones. *J Surg Educ.* 2016;73(4):735–740. doi:10.1016/j.jtsurg.2016.02.012.



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

**Conflict of interest:** The authors report no competing interests.

The authors would like to thank Sarah Block for her assistance with the preparation of this manuscript.

This research was presented as a poster abstract at the AAMC Annual Meeting, Phoenix, Arizona, November 8–12, 2019.

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Received March 3, 2020; revision received May 18, 2020; accepted July 15, 2020.