



If You Build It, Will They Come? Candidate Completion of Preinterview Screening Assessments

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INTRODUCTION: Residency applicant screening practices are inefficient and costly. However, programs may not consider using alternative assessments for fear that candidates will be “turned off” by additional hurdles in the application process. This study explores the relationship between candidate completion of preinterview screening assessments, applicant examination scores, and program factors.

METHODS: Applicants to any of 7 general surgery residency programs were invited to take a preinterview online assessment. Program characteristics and applicant United States Medical Licensing Exams scores were considered in relation to each program’s assessment completion rate.

RESULTS: A total of 2960 applicants were invited to take the assessment and 97% (2870/2960) completed it. Program completion rates ranged from 95% to 98%. There was no correlation between program characteristics and applicant completion rates. Candidates who did not complete the assessment had significantly lower United States Medical Licensing Exams scores.

CONCLUSIONS: Incorporating preinterview assessments to objectively measure candidate competencies and fit will not detract applicants from a general surgery program. (J Surg Ed 76:1534–1538. © 2019 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: selection, recruitment, screening, residency, situational judgment test

COMPETENCIES: Systems-Based Practice, Professionalism, Interpersonal and Communication Skills

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INTRODUCTION

Selection of candidates into general surgery residency training is a complex task, requiring highly dedicated faculty and staff, as well as applicants, to spend substantial time and resources to determine their fit for one another. Recent studies have shown that general surgery residency programs, seeking to fill on average just 5 categorical positions, spend an average of \$100,000 *each year* on time and resources dedicated to reviewing applications and conducting multiple interview days.¹ Applicants are burdened by the process as well, spending up to \$11,000 on application fees and travel to find their future residency home.²

These inefficiencies may be a result of the limited number of tools available for decision-makers to identify candidates who might be the best fit for their programs. Unfortunately, the tools available—United States Medical Licensing Exams (USMLE), letters of recommendation, and personal statements—all have substantial limitations in their use for residency selection.³ Although Program Directors are motivated to bring in candidates who they believe will help their program satisfy the 65% board pass rate requirement, there are a number of potential unintended consequences for relying upon this tool. For example, USMLE—the most common metric for initial applicant screening—has documented bias against underrepresented minorities⁴⁻⁶ and limited utility in predicting future resident performance.⁷⁻¹⁰ For these and other reasons, USMLE has been criticized by scholars and its test developers for use in residency selection.¹¹⁻¹³ The lack of objectivity, indiscernible predictive validity, and high potential for bias in letters of recommendation and personal statements have similarly led scholars to criticize their role in residency selection.¹⁴⁻¹⁶

Thus, there is a clear need for development, validation, and adoption of better tools to screen residency

You are a resident that frequently interacts with ER attendings. Unfortunately, the Emergency Medicine department and the prior resident rotating on the service had a history of confrontation. As a result, you find that your actions are constantly being scrutinized by ER faculty. Your attending has received multiple complaints about your interpersonal behavior, although you are certain they are unfounded. Please indicate the effectiveness of each of the following responses you could take next:

	Not effective at all	Slightly effective	Moderately effective	Very effective	Extremely effective
Tell your attending the complaints are without merit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Speak with the EM faculty to inquire more about how your behavior is being perceived	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apologize to EM faculty and monitor your behavior closely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do nothing, and keep to yourself when in the ED	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Speak with the Fellowship Director about these issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

FIGURE 1. Example situational judgment test item administered through the SelectWise (©) system.

applicants in an efficient, equitable, and scientific manner. Such tools can be distributed electronically as part of a “multiple hurdle” application process for candidates who meet minimum selection criteria. The results of these online assessments could then be used to make interview invitation decisions. Given the dynamics of the ranking and match system, however, program directors may fear that doing something outside of the “normal” application process may dissuade competitive candidates from continuing to pursue a position in their training program. Indeed, some work suggests that highly confident and competitive applicants pursuing multiple job opportunities simultaneously may expend less effort on an application process.¹⁷ Alternatively, self-justification theory¹⁸ predicts that applicants invited to take additional assessments are more motivated to complete such assessments to justify their decision to apply in the first place.

As theoretical and prior work in this area may not provide clarity on how these phenomena would unfold in the residency selection setting, the goal of this study was to investigate if requiring general surgery residency applicants to complete program-specific online assessment tools prior to offering interview invitations would dissuade them from continuing to participate in the application process. We also explored if any applicant or program characteristics might influence these assessment completion rates.

METHODS

Applicants to any of 7 US general surgery residencies who met minimum eligibility thresholds (visa status, USMLE scores, etc.) were invited to take an online assessment, providing each program with additional information about candidate competencies and fit in

order to select which applicants to invite for an interview. Applicants were given 1 hour to complete the assessment and deadlines by which they should complete the assessment from each program, ranging from 3 to 14 days after invitation.

Each assessment consisted of a customized 20 item situational judgment test (SJT—see example in Fig. 1) and a 31 item questionnaire pertaining to perceived ideal training program attributes that remained constant across programs. The SJT was designed to assess competencies deemed critical for entering trainees based on a prior job analysis conducted at each program. There was little overlap in SJT items (i.e, 5 items max) across programs. However, our assessment system was built such that no applicants were required to complete redundant items if they applied to multiple programs that might share the same items.

In addition to recording applicant participation in taking the online assessments, program characteristics were collected to determine if any identifiable factors influenced the likelihood of candidates completing the assessment. These included the number of categorical positions offered, residency type, program longevity, American Board of Surgery (ABS) pass rates, city size, cost of living, and distance to an oceanic beach (as an indirect measure of desirable location). Applicant USMLE Step 1 and 2 scores were also considered to explore differences between completion and noncompletion groups. Descriptive statistics, independent samples *t* tests, and ANOVA were used to analyze the data using SPSS 25.0.

RESULTS

A total of 2960 categorical applicants (1625 unique applicants) were invited to take an online assessment by

at least 1 of the 7 programs, representing approximately 70% of all US medical students.¹⁹ Based on prior work showing potential adverse impact⁴⁻⁶ and minimal predictive utility of the USMLE1,⁷⁻¹⁰ programs were asked to lower their traditional USMLE cutoffs to 210 and to invite all otherwise eligible candidates to be considered. Ninety-seven percent (2870/2960) completed it within the respective program deadlines. Program completion rates ranged from 95% to 98%. Average time to complete the assessment across all programs was 35 minutes (SD = 21.60). Only 0.001% (N = 3) of applicants started but did not complete the assessment, indicating almost no test abandonment.

Six of the programs were University affiliated (University or University-Hospital based) and 1 community-based. Each offered an average of 6 (6.14 ± 2.41; range = 4-10) categorical positions with about 46 years in existence (46.14 ± 34.96; range = 1-100). Average ABS first attempt pass rates were 88.6 ± 11.10 percent (range 73-100) for the qualifying exam (QE), 82.8 ± 3.27 percent (range = 79-88) for the certifying exam (CE), and 74.6 ± 10.26 percent (range = 59-85) for the QE/CE first attempt index. Two programs had not yet had any graduates to inform pass rate data. The cities in which the programs existed varied greatly with populations ranging from 90,280 to 2,313,000 residents, average median home costs ranging from \$50,800 to \$199,300, and distance to an oceanic beach ranging from 36 to 530 miles.

Table 1 shows the program data in relation to applicant completion rates. There were no significant differences in assessment completion rates based on program type (p = 0.50), size (p = 0.25), or longevity (p = 0.12), program city size (p = 0.31), median home costs (p = 0.24), distance to beach (p = 0.78), ABS QE (p = 0.48), ABS CE (p = 0.71), or ABS 5 year board pass rates (p = 0.59).

Independent samples *t* tests revealed that candidates who did not complete the assessment (N = 90) had significantly lower USMLE 1 (224 versus 233, p < 0.05) and USMLE 2 (240 versus 244, p < 0.05) scores, even after controlling for unequal sample sizes.

DISCUSSION

The results of this study reveal that incorporating preinterview assessments to provide objective information about candidate competency and fit will not detract applicants from applying to general surgery programs. Ninety-seven percent of the sample, which included approximately 70% of applicants in the 2018 to 2019 match season¹⁹ to general surgery residency, completed the assessment within the timeframe required and in about 35 minutes. These data align with research on escalation

TABLE 1. Program Characteristics and Applicant Completion Rates

Program	Program Type	Categorical Positions Per Year	Residency Longevity	Program City Size	Median Home Cost	Distance to Beach	ABS QE 1st Time Pass	ABS CE 1st Time Pass	5-Year ABS Pass	Number of Applicants Invited	% Completed by Deadline
1	University	9	65	2,313,000	175,700	23 miles	82%	82%	71%	812	97%
2	Community	4	1	103,483	199,300	36 miles	N/A	N/A	N/A	138	95%
3	University	6	100	385,525	50,800	493 miles	97%	79%	76%	511	98%
4	University	5	40	253,888	131,600	530 miles	73%	82%	59%	173	95%
5	University-Hospital	4	4	90,280	111,100	84 miles	N/A	N/A	N/A	200	97%
6	University-Hospital	5	59	146,444	125,300	17 miles	100%	83%	85%	329	95%
7	University	10	54	151,200	165,700	143 miles	91%	88%	82%	552	97%
Average		6.14	46.14	686,374	137,071	189 miles	89%	83%	75%	388	97%

of commitment and self-justification theory, which has shown that individuals are motivated to pursue courses of action that validate prior decisions¹ and that applicant motivation to join an organization is directly related to their willingness to complete additional hurdles.²³ Practically, these findings also likely reflect the current state of general surgery selection wherein there are at least twice as many applicants as there are positions. As such, it is in an applicant's best interest to not voluntarily take their name out of the running.

These findings, combined with the fact that no program characteristics impacted assessment completion rates, should reassure residency programs seeking to use selection tools not currently available in electronic residency application service packets. Use of such tools may soon be even more necessary as many stakeholders are seeking to make USMLE pass/fail.²⁰ If that movement is successful, the results of the present study suggest that programs should feel confident integrating assessments developed for the purposes of selection into their candidate evaluation processes to sort through the 800+ applications received each year.¹⁹

This study also revealed that candidates considered more "competitive," as measured by USMLE scores, were not less likely to complete the assessment. In fact, the group of applicants who did not complete the assessment had significantly *lower* USMLE scores. This finding challenges the common assumption that applicants with favorable application packets will be discouraged by additional application requirements, such as completing an additional assessment.

As with any study, this investigation is not without its limitations. First, it included a small sample of 7 programs which may raise questions regarding the generalizability of these findings to the other ~270 general surgery residencies in the country. However, given the variety of characteristics in the included programs and the fact that 70% of the 2018 to 2019 applicants to US general surgery residency took at least 1 assessment, it is likely that this snapshot is a true representation of broader applicant completion rates. Future work needs to be done, however, to ascertain if these high completion rates are maintained when candidates are asked to go through this process for a dozen or more programs. Additionally, we only explored USMLE scores to understand what individual applicant characteristics might impact completion rates. We used these scores as they were the most objective and readily available, though future explorations may capture more comprehensive data from the applicants. It is also unclear if longer assessments might result in different completion rates. Although work from industry²¹ has shown that longer applicant assessments are not correlated with applicant attrition, it is unclear how this relationship translates to

surgery residency where applicants are applying to 50 or more programs.¹⁹ Finally, although we did not formally measure faculty and staff hours invested in this process for each program as has been done in prior studies,^{1,22} we did remove what has been identified as a major portion of time commitment in the early screening stages— manual review of applicant files. Thus, any cost/benefit of costs incurred from programs should be compared to historic time and resource commitments.

CONCLUSION

Incorporating preinterview assessments to provide programs with objective information about candidate competency and fit will not detract applicants from applying to general surgery training programs. Candidates considered more "competitive," as measured by USMLE scores, were more likely to complete the assessment, and program characteristics did not impact completion rates.

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