

Simulation-Based Selection of Surgical Trainees: Considerations, Challenges, and Opportunities



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When faced with a large number of applicants for a limited number of positions, residency and fellowship programs in surgery must adopt some kind of selection procedure. For residency programs, these selection procedures are traditionally based on academic achievement, knowledge of science-related subjects, and cognitive abilities.¹ Although these cognitively oriented variables have been shown to be good predictors of academic performance in medical training,² educators still struggle to implement effective and efficient ways to identify individuals who will be successful in their training programs.¹ For example, many suggest that screening for decision-making skills, emotional intelligence, or even innate dexterity might be helpful for various specialties.^{2,3} Although some current screening methods, such as letters of recommendations or interviews, can variably capture some of these competencies, few standardized assessments exist. As these constructs are hard to assess with traditional paper-and-pencil formats, innovative screening and assessment programs, including the use of simulation, might be needed. For example, placing an applicant in a realistic scenario in which he or she might have to demonstrate problem solving, interpersonal, and/or leadership skills can provide unique information that decision makers might not otherwise obtain using solely cognitive assessments.

It is possible that simulation can provide decision makers with important information about applicant

suitability, but little is currently known about the feasibility and use of incorporating simulation exercises into the screening and selection process in medical education. A better understanding of if and how simulation can be used to help inform selection decisions among surgical educators is needed. What follows is a summary of these discussions, with an overview of the strengths and limitations of the use of simulation in the selection of candidates into training programs.

VALUE OF SIMULATION-BASED SELECTION

Supporters of using simulation-based selection (SBS) for applicants point to the notion of behavioral consistency,⁴ which posits that the behavior of candidates in situations similar to those encountered in the hospital will provide good predictions of actual behavior in the clinical setting. Placing applicants in situations that will be experienced later during training provides a “realistic preview” of how that candidate might perform in a training program. Importantly, these simulations can take a variety of forms, as shown in Table 1.⁵ They can be situational judgment tests (SJTs) in which applicants are presented with situations that they will likely encounter during training and asks candidates to respond in one of two ways, what they would do or what they should do, given the situation. Or, SBS can take the form of work samples, in which candidates are asked to perform hands-on tasks (eg a skill or procedure) that are physically and/or psychologically similar to those performed in training. Finally, SBS can be more high-fidelity “assessment centers” (eg role plays) meant to measure a wide array of nontechnical competencies, such as interpersonal skills, communication skills, organizing, judgment, and analytical skills. Regardless of form, the sole purpose of SBS remains the same: to make decisions based on data derived from applicant performance when completing a task, interacting with others, or working with systems. As will be discussed, SBS has numerous benefits over traditional selection processes, including allowing flexibility in implementation, capturing a wider array of candidate competencies, “test driving” the applicant, potentially enhancing the validity of selection decisions, and providing a realistic preview to applicants.

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Table 1. Overview of Situational Judgment Tests, Work Samples, and Assessment Centers

Method	Definition	Example	Advantages	Disadvantages
Situational judgment tests	Applicants are presented with a description of a work-related scenario and asked to exercise their judgment by choosing alternative courses of action given the situation.	You are a junior resident rotating on a service that frequently interacts with EM residents and attendings. Unfortunately, the EM department and surgery house staff have a history of confrontation. As a result, you find that your actions are constantly being scrutinized and questioned by EM faculty and residents. Your attending has received multiple complaints about your interpersonal behavior, although you are certain they are unfounded. Which of the following actions should you take, from most to least appropriate? A. Tell your attending the complaints are without merit. B. Talk to your colleagues to see if they are having similar experiences on this rotation. C. Speak with the EM faculty to inquire more about how your behavior is being perceived. D. Apologize to EM faculty and residents and monitor your behavior closely. E. Do nothing, and keep to yourself until the rotation is over. F. Speak with the program director about these issues.	Easily administered and scored, especially when using video-based or digital technology to administer and record answers; applicants can see the link between SJT scenarios and the work. As a result, they take the test seriously and try to do well. Also, the test provides a good preview of what the job will be like; SJTs are generally not susceptible to “practice effects” (ie improved performance on the assessment if the applicants complete it more than once). It is harder for dishonest applicants to remember and disclose the longer SJT questions to other applicants.	SJTs help measure applicants’ responses to ambiguous conditions. Good SJT scenarios contain a rich set of details, only some of which help determine the correct answer. If the test provides insufficient detail, the question does not fully test an applicant’s ability to discern the relevant information and respond accordingly; if correct answers are too obvious, the SJT can become a test of what applicants know they “should” do on the job rather than what they would actually do.
Work samples	Evaluates applicants’ job-related skills by having them perform actual activities or tasks that are physically or mentally similar to the duties they would perform on the job.	A work sample for a general surgery residency position might involve having applicants perform knot-tying or suturing tasks.	They generally have high predictive validity; applicants are less able to “fake” proficiency; Applicants view them as fair because they can see the relationship to the job; work sample tests provide applicants with a job preview to better inform their decision on whether they are a good fit for the job.	They generally do not measure aptitude or future potential; their scope is limited to only the competencies needed for the specific activity carried out during the test; they are not very useful for tasks that take a long time to complete.
Assessment centers	Uses multiple techniques and multiple assessors to produce judgments about the extent to which a participant displays selected competencies.	Assessment centers always use more than one exercise to measure the different applicant dimensions under review. Some of the more common exercises used in assessment centers include in-basket exercises (in which an applicant manages a set of tasks provided in a simulated in basket), leaderless group discussions, structured interviews, and oral presentations.	They have moderately high validity ratings, meaning that they have been found to be good predictors of job performance, especially in terms of leadership abilities; applicants view them as fair because they can see the relationship between the exercises and the job; assessment centers provide applicants with a job preview to better inform their decision on whether they are a good fit for the job.	The key disadvantage to assessment centers is that they are resource intensive. They take time and expertise to develop and organize. They require multiple, trained raters. They require space, equipment, and materials to administer. All of these resources amount to a fairly significant cost.

Adapted from the US Merit Systems Protection Board.⁵
EM, emergency medicine; SJT, situational judgment tests.

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