Selecting the Best and Brightest: A Structured Approach to Orthopedic Resident Selection ☆

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BACKGROUND: Resident selection is integral to the graduate medical educational process and the future of our profession. There is no consensus among residency directors as to how to systematically and consistently screen and select applicants who would perform well as residents. The purpose of this study was to introduce and assess a high volume application screening tool and semistructured interview process.

METHODS: This study took place in an academic orthopedic surgery department over 2 years (2013-2014). Overall, 1382 applications were screened in 7 categories, with a maximum score of 100. A total of 14 faculty reviewed applications; 218 interviews were offered; 165 applicants accepted the interview. Overall, 4 interview domains (cognitive, affective, activities, and theme), and an impression score were ranked from 1 (Exceptional) to 6 (Concern). Each room had an assigned "theme" (ethics, affective, cognitive, research, and "fit") with standardized questions. A summary score was generated of all scores to determine the preliminary rank list; the final rank list was determined after group discussion. Correlation between preliminary rank, final rank, and screening scores were assessed.

RESULTS: The average screening score was 62.5 (range: 0-100, median = 64). The average interview score was 69.5 (range: 32.24-95.0). Final rank lists correlated most highly with initial rank (0.912, $p < 0.001$), impression (0.847, $p < 0.001$), and affective domain (0.834, $p < 0.001$). Cognitive domain (0.628, $p < 0.001$) and screening scores (0.264, $p < 0.001$) less highly correlated with final rank position.

CONCLUSIONS: A systematic approach was used to screen and evaluate a large number of orthopedic surgery applicants. Our system demonstrated excellent feasibility, reliability, and predictability for the final rank list. (J Surg Ed 73:879-885. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: resident selection, orthopaedic surgery, screening, interview

COMPETENCIES: Professionalism, Interpersonal and Communication Skills, Medical Knowledge

INTRODUCTION

Resident selection is an integral part of the function and success of residency training programs and academic orthopedic programs. In recent years, orthopedic surgery has been among the most competitive of medical specialties, with nearly all positions filled in the initial match. In 2013, 1.5 applicants vied for every spot,[1] with training programs receiving over 100 applications for each available position.[2] Therefore, significant effort and time demand is placed on the residency training program faculty and administrative staff to process this information annually, in an organized, systematic, fair, and time-efficient manner, in a way to best predict who would succeed in residency and after. Every year, our program, like many others across all specialties in medicine, engages in the residency selection process thinking "we got it right, this year." Yet, despite best efforts, the selection process is often not sensitive enough to find those applicants who will not be successful as a house officer and practicing physician both in general and within our program specifically. Although the academic record (United States Medical Licensing examination scores, grades, etc.) shows no "red flags," the problem often lies in the affective domain.[3] We find ourselves frequently asking, "what did we miss?" and "how can we avoid this error in selection in future years?"

☆This work was performed at the University of Pennsylvania.

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This issue led our training program, within a large University-based academic medical center and health system, to systematically evaluate our selection process, from the initial application screening through the interview. The study presented herein is the first step in the process of validating an online resident selection instrument. Using our system, the purpose of this study was 3-fold: to determine if residency application factors predicted position on final rank list, to determine factors associated with change in rank list position between initial (computer-generated) and final (following interview and discussion) rank list, and to assess reliability of our instrument. The ultimate goal of this study group and the planned focus of future studies are to examine our ability to predict success (an elusive outcome to rigidly define) in residency and in life afterward utilizing this instrument.

MATERIALS AND METHODS

Study Population

Participants were medical students who applied to our institution's orthopedic surgery residency program in the 2013 and 2014 admission cycles, the first 2 cohorts to be screened and interviewed using the revised protocol. This included both foreign medical graduates and United States medical graduates. No predetermined standardized examination score was used as a screening cutoff, and the applicant pool was evaluated in its entirety. Because all data were already on hand and de-identified after a third party merged data sets, our Institutional Review Board deemed this study "Exempt" and explicit informed consent was not required of individual participants.

Admissions Protocols

Our department receives between 700 and 800 applications annually for 8 residency positions. Before the 2013 application cycle, several of the faculty screened the applications, and labeled them "must interview," "waitlist," or "do not interview." There were no predetermined consistent criteria for these labels, and approximately 80 interview invitations were extended per year on a subjective basis, based on a single faculty member's impression of the individual applicant. The formal interview process consisted of an on-site interview with faculty and chief residents. Each applicant had a 10-minute unstructured interview in each of 6 rooms. Immediately following the interview process (over the course of 2 full days), the interviewers generated a final rank list after unstructured discussion during a rank meeting. This process was thought to have several limitations: inclusiveness of all opinions was difficult for rank list development, leaving the process highly susceptible to bias from a few outspoken evaluators; reliability and predictability of the screening could not be evaluated as there was no objective or transparent scoring system; and the interview experience was not dependent on a predetermined structure making evaluation highly subjective.

To address these issues, beginning with the 2013 application cycle, we developed a standardized protocol for application screening (based, in part, our school of medicine's years of experience with their system) and semistructured interviewing system (based on literature in graduate medical education admissions and corporate hiring).[4-10] The screening score was scaled from 0 to 100, and 6 factors from the Electronic Residency Application Service (ERAS) were scored for previous academic and research performance: United States Medical Licensing examination Step I, medical school class rank and number of honors, Dean's Letter, Letters of Recommendation, and Research. In addition, an additional 25 points were scored for "Intangibles," including the quality of the medical school, performance on a rotation at our program, likelihood of being a good match at our program, personal statement, or overwhelming research or life experience (Table 1). After completion of the initial screening process, all of the scores were reviewed by the residency Program Directors (C.L.I., S.M., and J.A.), and invitations were extended for on-site interviews at our institution.

On-site interviews were conducted over a 2-day period. Faculty and chief residents were divided into 6 rooms, and each room, except for the Chairman's room, was assigned a theme. Themes included knowledge, affective domain, ethics, research, and "fit." All themes were labeled on the outside of the doors, alongside the names of the interviewers, for transparency with the applicants. Each interviewer was also provided with the applicant's full application, as well as a set of standardized scenarios and questions for their theme to use during the interviews. Each applicant met with all interviewers, and the interview time was capped at 10 minutes. Interviewers were free to ask any questions to the applicants, but were asked to allocate a portion of their time to theme-specific questioning. Immediately following the interview with each applicant, all interviewers completed a brief survey on their on-line devices on a scale of 1 (exceptional) to 6 (major concern). Scores were provided by all interviewers for cognitive, affective, theme, activities or other, and overall impression for each applicant (Table 2). At the conclusion of the interview days, the interview scores were tabulated and scaled to a maximum score of 100, by averaging the 5 scores, subtracting the average score from 6, and multiplying that number by 20. These scores were then placed in descending order, and represented our "initial rank list." Immediately following the conclusion of the interviews, all interviewers met in a formal rank meeting, and after group discussion, movement of applicants up and down the rank list determined our "final rank list." Movement up or down the list required justification by the initiator and agreement by the committee.