EDUCATIONAL ADVANCES

Selection Criteria for Emergency Medicine

program directors, respectively. These data, however, were part of a multidisciplinary study, which sought to draw generalized conclusions not speci®c to EM. Because a majority of the current literature concludes that there are interdisciplinary differences in the criteria used to select residents, extrapolation of results from these multispecialty studies for use in EM is not necessarily justi®ed. [3±6,8,9] Because of these differences and because of the lack of consistency in the literature, this study was undertaken to determine which criteria are important in selecting EM residents.

METHODS

Study Design. This was a survey study of EM residency directors. Because of its voluntary nature, it was considered exempt from informed consent.

Survey Content and Administration. A 21-item questionnaire was developed based on the new ERAS application, [2] and from personal and anecdotal experiences of residency directors. The surveyed items related to the importance of the applicants' medical school, grades, board scores, residency interview, personal statement, recommendations, Alpha Omega Alpha Honor Society (AOA) status, elective rotation done at the program director's institution, awards/achievements, publications, interest expressed in the program director's institution, and extracurricular activities. Grades were further subcategorized into basic science, clinical, and EM rotations. Board scores were further broken down into U.S. Medical Licensing Examination (USMLE) step I and step II. After each subsection regarding board scores, there was an open response statement that read ``Do you have an absolute minimum score requirement? If so, please list.'' The last item on the questionnaire was an open-response section, ``other,'' in which the respondents were given the opportunity to enter any information that they believed to be relevant, not included, or not adequately addressed in the previous items.

Although many studies show higher response

TABLE 1. Questionnaire Results

	Mean	SD	Median	Range
Emergency medicine rotation grades	4.79	0.50	5	3±5
Interview	4.62	0.64	5	2±5
Clinical grades	4.35	0.70	4	2±5
Other	4.23	1.17	5	1±5
Recommendations	4.11	0.85	4	2±5
Grades (overall)	3.95	0.64	4	2±5
Elective at the program director's institution	3.76	1.25	4	1±5
Board scores (overall)	3.35	0.77	3	1±5
USMLE* step II	3.34	0.93	3	1±5
Interest expressed	3.30	1.19	3	1±5
USMLE step I	3.28	0.86	3	1±5
Awards/achievements	3.16	0.88	3	1±5
AOA² status	3.01	1.09	3	1±5
Medical school attended	3.00	0.85	3	1±5
Extracurricular a97 T±5				

tant selection factor (4.11 6 0.85) and ranked as the fourth most important factor in our study. Recommendations, along with the interview, have often been thought to be one of the most important selection factors of residency applicants. In a 1986 multispecialty publication, Wagoner and colleagues ranked letters of recommendation in order of importance based on questionnaire responses.

TABLE 2. Open Responses

I. Career-related/goal-related	48
Future plans	14
Contributing to specialty	2
Indigent care	2
Local ties	4
Spanish-speaking	4
Commitment to EM*	19
Interest for EM	4
Teaching interests	2
Research interests	2
Insight career choice	6
EM experience	15
EMT[2]/paramedic	5
Nurse	3
Managerial	1
Volunteer community work	2
Research	1
Service	1
Hospital	2
II. Personal characteristics	39
Personality	7
Well-rounded	1
Interpersonal skills	4
Attitude	1
Character	13
Integrity	4
Maturity	3
Humanistic values/ideas	1
Patient advocate	1
Helping others	1
Work ethic	14
Teachability	3
Organizational skills	1
Team player	1
Motivation	1
Reliability	1
Responsibility	1
Hard working	1
Goals accomplished	3
Amorphous	5
Gut feel	1
Fit	4
III. Medical school performance	23
Dean's letter	5
Class rank	2
Competitive medical school	2
American school	3
Recommendations from EM	7
Clinical performance	1

*EM = emergency medicine.
[2]EMT = emergency medical technician.

interaction with the faculty, staff, and other residents, as well as his or her participation in conferences and meetings. From the student's point of view, it provides an excellent opportunity to gain exposure to the prospective program, and provides the student with insight into his or her ®t within a particular hospital environment. These interactions may leave a lasting impression on the program that carries into the selection meetings. This is the ideal outcome of any such rotation as it adds a face and a personality to an application and may actually help to overcome shortcomings within a student's application.

Simply expressing an interest in the institution's residency program is seen as a moderately important selection factor. Indeed, this ranks above USMLE step I scores, and just below step II based on average responses. It is a common practice for applicants to send letters, telephone residency directors, and visit institutions in an attempt to favorably impress residency directors, and express their aspirations of becoming a resident, or of their intention of ranking a program highly. Although traditionally regarded as common etiquette, it appears from this study that this practice may actually be at least moderately important in the ®nal evaluation of a student's application.

Performance Criteria. The most important performance criteria is the EM rotation grade (4.79 6 0.50). This is followed closely by clinical grades (4.36 6 0.70). Many studies have attempted to determine whether clinical performance in medical school predicts postgraduate performance. Some have shown little or no correlation between objective measures of performance and postgraduate success.[16,22,31,32] The majority, however, have shown at least a moderate predictive value of clinical grades with respect to postgraduate performance.[17±19,23,33±35] This relationship is less apparent with respect to preclinical grades. Preclinical classes provide information on medical concepts, but rarely relate to providing daily patient care. High grades in these courses may indicate that the student is responsible and diligent, but few conclusions can be inferred as to his or her eventual performance as a houseof®cer. In fact, a majority of the literature suggests that there is little, if any, correlation between basic science/preclinical grades and postgraduate performance.[16±18,22,31,32,35] Our study suggests that EM program directors generally regard preclinical grades (2.88 6 0.93) as less important in the selection process.

Medical schools place much emphasis on the results of the USMLE step I and step II to show that medical students have acquired a minimum amount of knowledge required to advance to the postgraduate level. A passing grade is required on these tests as well as step III in order to become a licensed physician. Because of their length, these tests approach >95% reliability.[17] As these tests are ``standardized,'' many residency programs use these tests as both screening tools and as a means of interapplicant comparison of knowledge acquired in medical school. A moderate to high correlation between USMLE scores and postgraduate performance has been described,[16,17,21,36] especially in regard to USMLE step II. Some studies suggest that higher scores on USMLE steps I and II are predictive of higher scores on step III, as well as inservice exams.[19,36,37] In our study, a moderate emphasis was placed on board scores as a selection factor. A minimum score was required by 39.4% of the respondents for USMLE step I (195 6 13), and 31.91% stated they had a minimum requirement for step II (194 6 15), with most responses lying between passing and 50th percentile. Although setting a minimum requirement does not imply that it is being used as a screening tool, some programs may be initially screening applicants on the basis of their USMLE scores. However, to appropriately use the USMLE as a screening tool would require data indicating that applicants performing below the speci®ed cutoff point perform signi®cantly worse than those performing above the cutoff.[38]

Publications and AOA membership were the least important performance criteria for EM residency selection. Few citations ®nd an association between AOA status and postgraduate performance.[16,34] Our study indicates that there is an inconsistent use of AOA status (3.01 6 1.09) in EM residency selection. Similarly, publications (2.87 6 0.99) seem to be relatively unimportant in the selection process, ranking near the bottom relative to all other criteria. Successful publication may contribute to the overall impression of maturity,

terests, hobbies, and activities outside of medical school. The lack of awards and achievements is often a source of stress for applicants, although this criterion was seen as only moderately important (3.16 6 0.88). Finally, the medical school attended was found to be of moderate importance (3.00 6 0.85). The meaning of this ®nding, however, is unclear, since the wording of the survey item did not allow for uniformity of response.

Open Response. The majority of the career-related/goal-related responses obtained as open comments pertained to the applicant's commitment to EM, EM experience, and future plans. There was a wide range of responses related to personal characteristics, which dealt mainly with work ethic, character, and personality. A majority of the open responses (with the exception of those related to the applicant's medical school) would likely be obtained during the interview or from letter of recommendation, further emphasizing the importance of these components of the student's residency application.

LIMITATIONS AND FUTURE QUESTIONS

Surveys are intrinsically prone to response bias, because respondents have both conscious and subconscious tendencies built into their responses. This is particularly apparent in our results regarding the importance of the applicant's medical school. We expected, based on Association of American Medical Colleges data, a bias for U.S. allopathic medical schools; however, this was not seen in this study. It is possible that response bias is at least partially responsible for this ®nding. [40] Another shortcoming of this study, as previously mentioned, is the low response rate for some items, such as a minimum requirement for USMLE steps I and II. It is unclear whether the nonresponders do not have minimums or whether they do not want to disclose the fact that they have them. Therefore, although a mean value is calculated for this response, its importance is unclear.

Further studies are needed to predict subsequent EM resident performance based on selection factors considered important by residency programs. A prospective study to determine which criteria are predictive of superior performance as a resident and attending would be dif®cult, but would substantiate the use of these criteria in the selection process or provide an impetus for changing the process. A retrospective look at the true values (mean, absolute minimum) required for admission to individual programs might be helpful for student applicants and program directors in evaluating quali®cations. Further studies should also be done to determine the true prevalence of selection bias with respect to medical school attended and to point out the true importance of foreign vs U.S. and osteopathic vs allopathic medical schools. Last, research has been started by Girzadas et al. [41] with regard to the standardized letter of recommendation (SLOR) vs the narrative letter of recommendation. Further studies are needed to determine exactly how SLORs can be best utilized.

CONCLUSIONS

To our knowledge, our study is the ®rst expressly dedicated to the evaluation of the selection criteria for EM residents. The most important selection criteria are EM rotation grade, interview, clinical grades, and recommendations. Criteria showing the most consistency among programs (lowest SD) included the EM rotation grade, interview, and clinical grades.

Special appreciation is extended to all residency program directors who responded to the study questionnaire. Their time

ulation-based randomized trial of variations in design and mailing routines. Am J Epidemiol. 1998; 147(1):74±82.
15. Federation of State Medical Boards and the National Board of Medical Examiners. 1998 Step I and II General In-