

Programs Selection Criteria for Neurological Surgery Applicants in the United States: A National Survey for Neurological Surgery Program Directors

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■ **OBJECTIVES:** To determine the criteria used by neurosurgery resident selection committees in different programs and to assess the process of selection.

■ **METHODS:** A questionnaire based on the Electronic Residency Application Service (ERAS) guidelines was mailed to all 100 neurosurgery residency program directors in August 2011. Items included related to selection process, factors affecting decision, and degree of satisfaction by the process. Responses were recorded by the use of 4- and 3-point Likert scales of importance. Mean values were used to create rank orders of selection criteria. Multivariate analysis was conducted to determine predictors of long-term satisfaction with resident selection.

■ **RESULTS:** The overall response rate was 46%. In the selection process the most important factors (>3.0) were the interview process (mean \pm SD = 3.80 ± 0.65), United States Medical Licensing Examination (USMLE I) (3.58 ± 0.54), and letters of recommendations (3.56 ± 0.54). High satisfaction with selected residents was recorded in 60.86% of program directors. In multivariate analysis, predictors of long-term satisfaction with resident selection included less emphasis on letters of recommendation ($P = 0.037$) and greater weight on applicant extramural activity ($P = 0.038$).

■ **CONCLUSION:** Interview process, USMLE I, and letters of recommendations were the most important factors affecting residents selection. Most of the program directors

are satisfied by this process and applicants pool as it reflects somehow their performance during residency.

Since the approval of the national Neurological Surgery Matching Program in 1983 for residency positions to begin in July 1, 1985, by the Society of Neurological Surgeons (11), neurologic surgery has become one of the most competitive specialties because of the great number of applicants and the limited number of residency positions. It has become of great importance for both the program director and the medical graduate to be aware of the guidelines as well as the factors that contribute the most in the selection of neurological surgery (NSG) residents because these factors have become the best predictors of residents performance during residency years (6, 17, 19). Medical graduates who wish to pursue their career in NSG now have better insight for the factors looked at by the program directors. Taking that into consideration, medical graduates will improve their skills regarding these factors and thus improve their chances to match in the desirable program. This is turning into a win-win situation, where both the program directors and the medical graduates are satisfied by their own choices, which improves the productivity of the NSG field (14, 17, 19).

METHODS

Study Design

This was a survey study of NSG residency directors (Appendix, available online). Follow-up was done via phone calls and e-mailing.

Key words

- Interview
- Neurosurgery education
- Program director
- Residency program
- USMLE

Abbreviations and Acronyms

- CI:** Confidence interval
- FMG:** Foreign medical graduates
- LoR:** Letter of recommendation
- NSG:** Neurosurgery
- OR:** Odds ratio
- USMLE:** United States Medical Licensing Examination



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The study was considered exempt from consent because of its voluntary nature.

Survey Content and Administrations

Questionnaires of 23 items were designed with the Electronic Residency Application Service application (2) as well as other specialties surveys that have the same pattern (10, 13). Questionnaires were sent to the 100 NSG graduate training programs accredited by the Accreditation Council for Graduate Medical Education in August 2011. The responses remained anonymous to the reviewers. The questionnaire was divided into four sections: general information, interview process, the decision process, and a retrospective view of past decisions. In the general information section, these items were inquired about: description of the program, whether it is hospital-based or university-based; number of applicants; number of applicants accepted; intention to increase the size of the program in terms of the number of residents; and the number of foreign medical graduates (FMGs) accepted. In the interview process section, these items were inquired about: number of candidates invited, length of interview process, who conducted the interviews, and factors evaluated during the interview. In the decision process section, the following items were inquired about: who finalizes the rank order list, importance of each factor in selection of the residents, and minimum cut-off scores. In the retrospective review section we assessed the degree of satisfaction of the program directors with the performance of the residents and the pool of applicants.

Statistical Analysis

Data are presented as mean and range for continuous variables, and as frequency for categorical variables. Analysis was performed using unpaired t-test, χ^2 test, and Fisher's exact tests. Univariate analysis was used to test covariates predictive of the following dependent variable: very satisfied with resident selection (compared with no and somewhat satisfied). Factors predictive in univariate analysis ($P < 0.20$) (1) were entered into a multivariate logistic regression analysis. P-values of ≤ 0.05 were considered statistically significant. Statistical analysis was carried out with Stata 10.0 (College Station, Texas, USA).

RESULTS

General Information Section

The overall response rate was 46%, with 46 of 100 programs responding. Thirty-two were university-based programs, which account for 69.57% of our respondents. Thirteen (28.26%) were hospital-based programs, and 1 program director (2.17%) failed to answer this question. The number of applicants for each program varied, ranging from 83 to 300 and mean of 170. The average number of interviews offered is 39 (Figure 1). The number of applicants accepted ranges from 1 to 4 with mean of 2.06 applicants. Seventeen (38.6%) programs have the intention of increasing the number of residents, whereas 25 (56.8%) have no intention to do that and only two (4.5%) programs are willing to decrease the size of the program. Two program directors failed to answer that question. The number of FMGs accepted in the last 10 years ranges from 1 to 5 with mean of 1.68 and SD of 1.35.

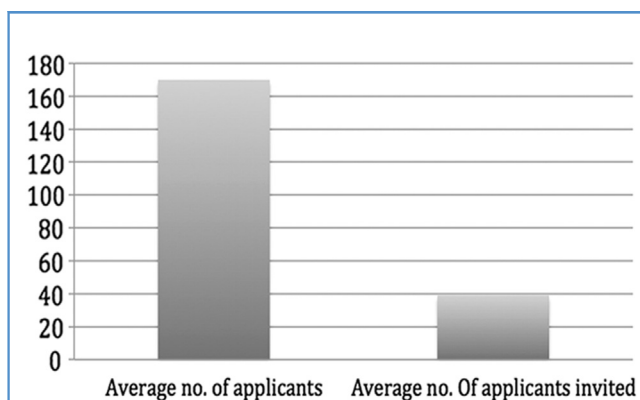


Figure 1. Average number of applications and applicants invited per program.

Interview Process Section

The number of candidates invited ranges from 24 to 60 with a mean of 36.04. The length of the interview process varied. In 6.52%, the interview was less than 4 hours, in 52.17% it was from 4 to 8 hours, in 15.2% it was from 8 to 16 hours, in 21.74% it was a 2-day interview process. Two of the respondents failed to answer this question. The interviews were conducted by program directors in 100% of the programs, residents in 100%, full-time faculty in 100%, part-time faculty in 41.3%, and staff members in 26%. During the interview, honesty was considered a positive factor among 100% of program directors (negative 0%, neutral 0%, positive 100%). Other factors were scored as follows: organization (0%, 42.5%, 57.5%), energy (0, 10%, 90%), confidence (2.5%, 32.5%, 65%), decision-making (0%, 32.5%, 67.5%), verbal skills (0, 12.5%, 87.5%), cooperative personality (0%, 15%, 85%), empathy (0%, 15%, 85%), analytical (0%, 35%, 65%), appearance (0%, 43.9%, 56.1%), social skills (0%, 15%, 85%), agreeable (0%, 35%, 65%), research interest (0%, 35%, 65%), aggressive (70%, 22.5%, 7.5%), anxious (85%, 12.5%, 2.5%), and interaction with residents at dinner (0%, 5%, 95%).

Decision Process Section

Answers collected for the person in charge of generating the list show that: In seven programs (15.2%), the list is generated by the program director alone, in 11 programs (30.5%) both the chairman and the program director generate the list, in 15 programs (32.6%) a committee of core faculty generate the list, and in 13 programs (38.26%) the list is generated by a committee composed of all faculties. Answers collected for those who finalize the list show: in four programs (8%) the program director alone does this, in two programs (4.34%) this is done by the chairman alone, in three programs (6.52%), this is done by both the program director and the chairman alone, in 35 programs (76), this is done by the full time faculty, and in 10 programs (21.7%), the part-time faculty completes this. Items ranking as most important (>3.0) in the selection process included: the interview process (mean \pm SD = 3.80 ± 0.65), United States Medical Licensing Examination, Step I (USMLE I; 3.58 ± 0.54), letters of recommendations (LoRs) (3.56 ± 0.54), medical school class rank (3.36 ± 0.64), interaction with

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