Neurosurgery Residency Websites: A Critical Evaluation

Branko Skovrlj[1], Jason Silvestre[2], Chinwe Ibeh[3], Joseph M. Abbatematteo[2], J. Mocco[1]

■ OBJECTIVE: **To evaluate the accessibility of educational and recruitment content of Neurosurgery Residency Websites (NRWs).**

■ METHODS: **Program lists from the Fellowship and Residency Electronic Interactive Database (FREIDA), Electronic Residency Application Service (ERAS), and the American Association of Neurological Surgeons (AANS) were accessed for the 2015 Match. These databases were assessed for accessibility of information and responsive program contacts. Presence of online recruitment and education variables was assessed, and correlations between program characteristics and website comprehensiveness were made.**

■ RESULTS: **All 103 neurosurgery residency programs had an NRW. The AANS database provided the most number of viable website links with 65 (63%). No links existed for 5 (5%) programs. A minority of programs contacts responded via e-mail (46%). A minority of recruitment (46%) and educational (49%) variables were available on the NRWs. Larger programs, as defined by the number of yearly residency spots and clinical faculty, maintained greater online content than smaller programs. Similar trends were seen with programs affiliated with a ranked medical school and hospital.**

■ CONCLUSIONS: **Multiple prior studies have demonstrated that medical students applying to neurosurgery rely heavily on residency program websites. As such, the paucity of content on NRWs allows for future opportunity to optimize online resources for neurosurgery training. Making sure that individual programs provide relevant content, make the content easier to find and adhere to established web design principles could increase the usability of NRWs.**

INTRODUCTION

Medical students applying for neurosurgery residency use web-based resources like the Electronic Residency Application Service (ERAS) to manage their applications (5). Most U.S.-based neurologic surgery residencies participate in the National Resident Matching Program (NRMP), which was established to coordinate the matriculation of residents. Interested applicants register on ERAS and can access a list of programs in deciding where to apply. Importantly, applicants can also access resources like the American Medical Association's Fellowship and Residency Electronic Interactive Database (FREIDA) (7) and the Residency Directory of the American Association of Neurological Surgeons (AANS) (1) to identify potential programs. These resources point interested applicants to neurosurgery residency websites (NRWs) via embedded website links to obtain additional information on prospective programs (14). Thus in addition to advice obtained from mentors and colleagues, Internet-based resources play a major role in helping neurosurgery applicants decide where to apply.

The purpose of this study was threefold: (1) assess the accessibility of information from national program lists; (2) determine the presence of online education and recruitment content; and (3) determine whether website comprehensiveness correlates with program characteristics.

Key words
- Education
- Internet
- Neurosurgery
- Recruitment
- Residency
- Website

Abbreviations and Acronyms
AANS: American Association of Neurological Surgeons
ERAS: Electronic Residency Application Service
FREIDA: American Medical Association's Fellowship and Residency Electronic Interactive Database
NRMP: National Resident Matching Program
NRWs: Neurosurgery residency websites

From the [1]Department of Neurosurgery, Icahn School of Medicine at Mount Sinai, New York, New York, USA; [2]Perelman School of Medicine at the University of Pennsylvania, Philadelphia, Pennsylvania, USA; [3]Drexel University College of Medicine, Philadelphia, Pennsylvania, USA

To whom correspondence should be addressed: J. Mocco, M.D. [E-mail: j.mocco@mountsinai.org]

Citation: World Neurosurg. (2015). http://dx.doi.org/10.1016/j.wneu.2015.04.051

Journal homepage: www.WORLDNEUROSURGERY.org

Available online: www.sciencedirect.com

While the utility of online resources for neurosurgery training has not been investigated, studies in other specialties demonstrated the significant impact program websites have during the application process (4, 5, 6, 8, 9). Previous studies of program websites in other surgical specialties have shown an underutilization of these resources for education and recruitment (11, 13, 16). Given this trend, we sought to evaluate the current state of NRWs.

METHODS

Study Inclusion

ERAS maintains a comprehensive database of neurosurgery residency programs participating in the Match (5). The American Medical Association maintains a list of accredited neurosurgery residency programs in the Fellowship and Residency Electronic Interactive Database (FREIDA) (7). Additionally, the AANS maintains a comprehensive listing of neurosurgery residency programs, which includes training programs in Mexico and Canada. We cross-referenced these resources to determine the list of active neurosurgery residency programs participating in the 2015 Match. We excluded programs that were not in the United States. Program lists were accessed on October 1, 2014.

Accessibility

Program lists from ERAS, FREIDA, and AANS were evaluated for accessibility of program information. Variables that were collected from these databases included total number of advertised programs and number of website links. These links were characterized as either nonfunctioning, requiring multiple steps to access the NRW, or direct link. We conducted an audit to determine program responsiveness using contact information from FREIDA. Provided e-mail addresses were used to solicit program information from an interested applicant. Identical e-mail requests for further information were sent from a Gmail account (Google). Responses were collected for 2 weeks.

To identify NRWs of programs with nonworking website links, a Google search was performed with "program name + neurosurgery residency." Google searches were performed on October 1, 2014. Any NRWs not found after this search were noted and excluded from further content analysis. These websites were excluded rather than deemed inaccessible to allow for the following distinction: inaccessible was reserved for websites that did exist but were not accessible from the links.

Website Evaluation

NRWs were accessed and assessed by two independent evaluators and reviewed by a neurosurgeon. A fourth independent investigator arbitrated any discrepancies and a consensus was established. Online variables were noted as being present or absent without judgment on information quality. That is, if the NRW provided information on the topic, the variable was marked as being present. This method, employed to maintain objectivity during the assessment and comparison, was used in similar studies in other surgical specialties.

Resident Recruitment and Education

NRWs were analyzed for program information employed to recruit prospective candidates. A total of 14 recruitment variables were selected on the basis of the methodology of similar studies in other surgical fields (11, 15, 16) and the consensus of study authors. Examples included general program description, application links, and program benefits (**Table 1**).

NRWs were evaluated for comprehensiveness in mentioning key components of the neurosurgery residency curriculum. The final list of 14 variables was refined after consensus among authors and the methodology of previous studies on this topic. Examples of these criteria included rotation overview, didactic instruction, research interests, and academic conferences (**Table 1**).

NRWs obtained a percentage score in the domains of resident recruitment and education according to the preceding criteria.

Program Comparison

Neurosurgery residency programs in the continental United States were stratified by region (South, North East, North West, West), number of yearly residency spots (1-4), number of faculty (1–15, 16+), and affiliation with a top *U.S. News & World Report* medical school and neurosurgery hospital. Sixteen was chosen as the division between large and small programs, as this reflected the mean program size. *U.S. News & World Report* ranks institutions on the basis of three dimensions of health care: structure, process, and outcomes. A proprietary algorithm also takes into account institutional reputation as determined by physician surveys. This metric is designed for consumers, not professionals, but may reflect program recognition and prestige. It is important to note, however, that the ranking is not education oriented (2, 3). Because no official ranking system exists to rank neurosurgery residency programs, this system was used as a proxy for program recognition.

Table 1. Education and Recruitment Variables

Education	Recruitment
Rotation Overview	Program Description
Didactic Instruction	Faculty Listing
Journal Club	Resident Listing
Academic Conferences	Salary
Research Requirement	Work Hours
Research Interests	Application Link
Meeting Attended	Interview Dates
Operative Experience	Graduate Fellowships
Journal Links	Selection Criteria
On-Call Schedule	Interview Day Details
Evaluation Criteria	Social Life
Research Citations	Domestic Considerations
Password Content	Debt Management
Association Links	Alumni Contact