

# Fellowship

After completing their neurosurgical [residency](#), some [residents](#) may choose to pursue further subspecialty training through [fellowship](#) programs in areas such as neurovascular surgery, neuro-oncology, functional neurosurgery, or pediatric neurosurgery.

A fellowship is a period of medical training in the [United States](#) and [Canada](#) that a physician or dentist may undertake after completing a specialty training program ([residency](#)). During this time (usually more than one year), the physician is known as a [fellow](#). Fellows are capable of acting as attending physicians or consultant physicians in the generalist field in which they were trained.

After completing a fellowship in the relevant sub-specialty, the physician is permitted to practice without direct supervision by other physicians in that sub-specialty.

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Sonig et al., published the first study that has used departmental [h index](#)-and [e index](#)-based matrices to assess the academic output of [neuroendovascular intervention fellowship](#) programs across the continental US.

Fellowship program listings were identified from academic and organization websites. Details for 37 programs were available. Bibliometric data for these programs were gathered from the Thomson Reuters [Web of Science](#) database. Citations for each [publication](#) from the fellowship's parent department were screened, and the h and e indices were calculated from non-open-surgical, central nervous system vascular publications. Variables including “high-productivity” centers, fellowship-comprehensive stroke center affiliation, fellowship accreditation status, neuroendovascular h index, e index (h index supplement), h10 index (publications during the last 10 years), and departmental faculty-based h indices were created and analyzed.

A positive correlation was seen between the neuroendovascular fellowship h index and corresponding h10 index ( $R = 0.885$ ;  $p < 0.0001$ ). The mean, median, and highest faculty-based h indices exhibited positive correlations with the neuroendovascular fellowship h index ( $R = 0.662$ ,  $p < 0.0001$ ;  $R = 0.617$ ,  $p < 0.0001$ ; and  $R = 0.649$ ,  $p < 0.0001$ , respectively). There was no significant difference ( $p = 0.824$ ) in the median values for the fellowship h index based on comprehensive stroke center affiliation (30 of 37 programs had such affiliations) or accreditation (18 of 37 programs had accreditation) ( $p = 0.223$ ). Based on the quartile analysis of the fellowship h index, 10 of 37 departments had an neuroendovascular h index of  $\geq 54$  (“high-productivity” centers); these centers had significantly more faculty ( $p = 0.013$ ) and a significantly higher mean faculty h index ( $p = 0.0001$ ).

The departmental h index and analysis of its publication topics can be used to calculate the h index of an associated subspecialty. The analysis was focused on the neuroendovascular specialty, and this methodology can be extended to other neurosurgical subspecialties. Individual faculty research interest is directly reflected in the research productivity of a department. High-productivity centers had significantly more faculty with significantly higher individual h indices. The current systems for neuroendovascular fellowship program accreditation do not have a meaningful impact on academic productivity <sup>1)</sup>.

Fellowship awards represent a strategic investment by the CNS on behalf of the field of neurosurgery. We offer fellowship awards for residents, neurosurgeons who have recently completed training and established neurosurgeons alike. The awards are meant to defer some of the costs fellows incur during their research and to enhance the education of neurological surgeons at all stages of their careers.

Applicants must complete an online standardized application, to be reviewed by the CNS fellowship committee. Applications may be given special consideration according to the research or clinical topic chosen and the importance of that topic to the field of neurosurgery. Any overlap in funding for the same research project and/or fellowship period should be disclosed to the CNS fellowship committee and will be considered on a case-by-case basis.

To ensure that suitable applicants receive fellowship training at centers that can provide a worthwhile learning experience, the CNS requires that the fellowship sponsor be qualified in the area of sought expertise, be interested in teaching and provide a suitable environment for the applicant.

<sup>1)</sup>

Sonig A, Shallwani H, Levy BR, Shakir HJ, Siddiqui AH. Academic impact and rankings of neuroendovascular fellowship programs across the United States. J Neurosurg. 2017 Jan 13:1-9. doi: 10.3171/2016.9.JNS161857. [Epub ahead of print] PubMed PMID: 28084907.

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