

Neurosurgery Elective for Preclinical Medical Students: 6-Year Follow-up



LETTER:

During the Spring semesters of 2012 and 2013, Zuckerman et al¹ designed and implemented a preclinical elective for medical students to increase early exposure to the field of neurosurgery. At the course's conclusion, students were more likely to consider neurosurgery for a career and felt neurosurgeons had a better work-life balance and collegiality than previously perceived. However, the students' perception of residency difficulty did not change. The most impactful part of the course was the in-depth, open discussions with neurosurgery faculty members about the multiple facets of their lives both in and outside neurosurgery. Areas of improvement included better organization of surgery schedules to allow for a more meaningful intraoperative experience.¹

Bonney et al² in an editorial questioned, "whether attrition would be higher in [...] a group that does not actively seek out opportunities in neurosurgery but is receptive to being sought out, than among students who are proactive about early exposure." We wholeheartedly agree that attrition, estimated to be 6.7%–12.5% in neurosurgical

training, is a valid concern.³⁻⁵ Presently, our understanding of neurosurgery resident recruitment and attrition is guided by minimal data, generated mostly without an evidence-based approach to drive decision making.

To understand the long-term impact of our preclinical neurosurgery elective, herein, we report a 6-year follow-up of our course with aims to answer the following questions:

1. What are the long-term effects of the preclinical neurosurgery elective on students' residency and career paths?
2. Did the elective lead to an increase in students applying for and matching into a neurosurgery residency?
3. Was there increased attrition in students who matched into neurosurgery?

A total of 35 (27 males, 8 females) students took the preclinical elective. Twenty-nine (22 males, 7 females) of these students are currently in a medical (10) or surgical (19) residency program. Medical specialties included anesthesiology (1), child neurology (1), emergency medicine (1), family medicine (1), internal medicine (2), neurology (1), pathology (1), and pediatrics (2). Surgical specialties included neurologic surgery (10), general surgery (2),

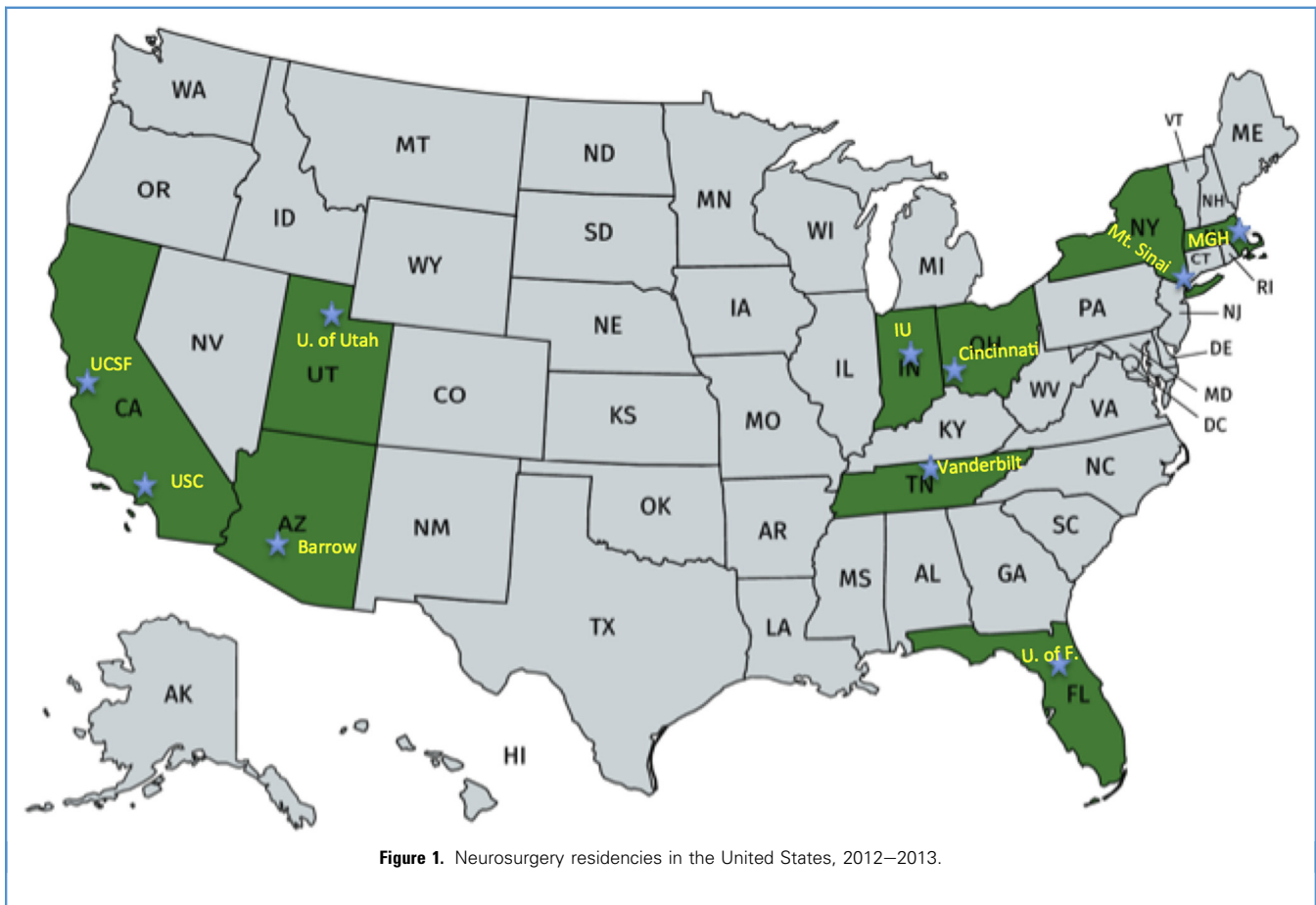


Figure 1. Neurosurgery residencies in the United States, 2012–2013.

ophthalmology (1), orthopedic surgery (4), otolaryngology (1), and plastic surgery (1). The 10 students (34.5%, 9 males, 1 female) who pursued a neurosurgery residency matched into the following programs: Barrow Neurological Institute, University of Cincinnati Medical Center, Icahn School of Medicine at Mount Sinai, Indiana University School of Medicine, Massachusetts General Hospital, University of California at San Francisco, University of Florida, University of Southern California, University of Utah, and Vanderbilt University Medical Center (Figure 1). At the time of this work, they are currently in the following postgraduate years (PGY): PGY-4 (2), PGY-3 (2), PGY-2 (5), and PGY-1 (1). We report a 0% attrition rate among both students who matched into neurosurgery and non-neurosurgery residency programs. The 6 students not in residency programs have pursued a medical scientist-training program, law, start-up business, and teaching.

Of the students who took our preclinical neurosurgery elective, 34.5% applied to a neurosurgery residency program and 100% matched. However, this percentage of students pursuing neurosurgery must be interpreted cautiously. The number may be inflated by selection bias. By enrolling in the elective, students likely had a preexisting interest in pursuing neurosurgery. However, the importance of a preclinical elective in catalyzing their initial interest into a committed drive for a career in neurosurgery deserves focus. The elective provided a practical and realistic perception of the field by neurosurgeons, instead of acquiring it indirectly by external means or from those with only marginal neurosurgery experience. Additionally, faculty enthusiasm for their career was infectious. Students often become excited by similarly energetic and motivated individuals. Thus it appears our preclinical neurosurgery elective was a viable method to increase preclinical medical student interest in neurosurgery. Furthermore, the elective did not increase attrition. All of the elective students who matched into neurosurgery are currently in residency, and we intend to continue to follow their development in the field of neurosurgery. It deserves mention that our report is potentially limited by not knowing which students intended to pursue neurosurgery but matched into another specialty. On the basis of anecdotal, institutional knowledge, all students from the elective who intended to match into neurosurgery did so successfully; however, it is possible, though unlikely, that students did not disclose their primary intention to pursue neurosurgery.

Bonney et al² remarked, "However, the success enjoyed by the Vanderbilt neurosurgery program within its medical school may not be generalizable to other programs." We agree that a limitation of this study is that it is

specific to only our institution, and we hope similar educational courses will report their long-term findings.⁶⁻⁸ However, we hope that our experience with this elective will encourage more institutions to provide early exposure to their medical students, especially in the absence of required courses or clinical rotations in neurosurgery. We recently restarted the neurosurgery elective, which was halted due to major changes to our institution's medical school curriculum. Encouraged by our past experience, enrollment was extended to students from a local medical school that does not have a neurosurgery department. Data collection and long-term career choice follow-up with current and future classes remain ongoing.

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REFERENCES

- Zuckerman SL, Mistry AM, Hanif R, Chambless LB, Neimat JS, Wellons JC 3rd, et al. Neurosurgery elective for preclinical medical students: early exposure and changing attitudes. *World Neurosurg.* 2016;86:120-126.
- Bonney PA, Fujii T, Zada G. Recruitment of medical students in neurosurgery. *World Neurosurg.* 2017;98:859.
- Lynch G, Nieto K, Puthenveetil S, Reyes M, Jureller M, Huang JH, et al. Attrition rates in neurosurgery residency: analysis of 1361 consecutive residents matched from 1990 to 1999. *J Neurosurg.* 2015;122:240-249.
- Renfrow JJ, Rodriguez A, Liu A, Pilitsis JG, Samadani U, Ganju A, et al. Positive trends in neurosurgery enrollment and attrition: analysis of the 2000-2009 female neurosurgery resident cohort. *J Neurosurg.* 2016;124:834-839.
- Zuckerman SL, Mistry A, Dewan MC, Morone PJ, Sills AK, Wellons JC 3rd, et al. In reply to: medical student recruitment into neurosurgery: maximizing the pool of talent. *World Neurosurg.* 2017;98:860.
- Agarwal N, Norrmen-Smith IO, Tomei KL, Prestigiacomo CJ, Gandhi CD. Improving medical student recruitment into neurological surgery: a single institution's experience. *World Neurosurg.* 2013;80:745-750.
- Kashkoush A, Feroze R, Myal S, Prabhu AV, Sansosti A, Tonetti D, et al. Fostering student interest in neurological surgery: the University of Pittsburgh experience [e-pub ahead of print]. *World Neurosurg.* <https://doi.org/10.1016/j.wneu.2017.08.125>, accessed November 8, 2017.
- Zuccato JA, Kulkarni AV. The impact of early medical school surgical exposure on interest in neurosurgery. *Can J Neurol Sci.* 2016;43:410-416.