



# Neurosurgery Elective for Preclinical Medical Students: Early Exposure and Changing Attitudes

Scott L. Zuckerman MD; Akshitkumar Mistry; Rimal Hanif MD; Joseph S. Neimat; John C. Wellons MD; J Mocco; Allen K. Sills MD; Matthew J. McGirt MD; Reid C. Thompson MD  
Vanderbilt University Medical Center, Department of Neurosurgery



## Introduction

Exposure to surgical sub-specialties is limited during the preclinical years of medical school. To offset this limitation, we created a Neurosurgery Elective for first and second year medical students. Our objective was to provide each student with early exposure to the field of neurosurgery by combining clinical experience with faculty discussions about the academic and personal realities of a career in neurosurgery.

## Methods

From 2012 to 2013, we offered a comprehensive Neurosurgery Elective to first and second year medical students. An introductory session was followed by 6 classes. Each class consisted of the following: 1) journal club; 2) student presentation; 3) faculty academic lecture; 4) faculty personal lecture followed by a question and answer session. All students completed anonymous pre- and post-elective surveys.

## Results

Thirty-five students were enrolled over a two-year period. The elective significantly increased student's knowledge across 11 areas. After completing the elective, students were more likely to: consider neurosurgery as a future career ( $p < 0.001$ ), perceive the personalities of attendings to be more collegial and friendly ( $p < 0.001$ ), perceive attending quality of life to be higher ( $p = 0.01$ ), and feel it was achievable to be a neurosurgeon and have a family ( $p < 0.001$ ). The elective did not alter students' perceptions about how emotionally draining neurosurgery can be ( $p = 0.09$ ) or how difficult the training is ( $p = 0.62$ ).

Figure 1. Neurosurgery elective structure throughout semester.

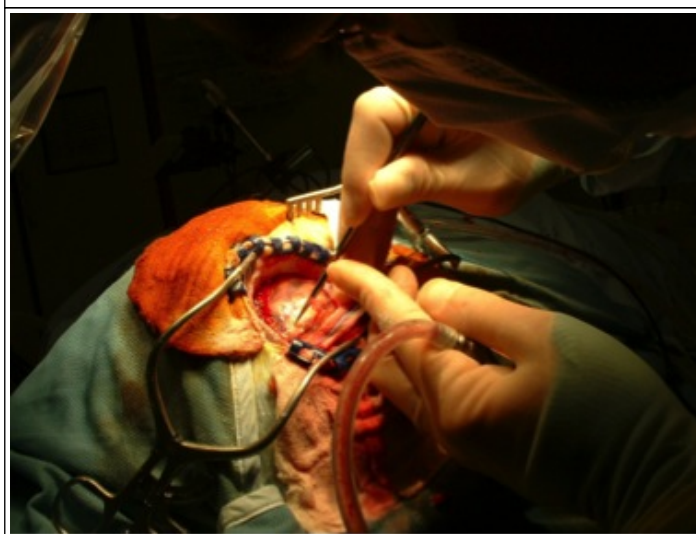
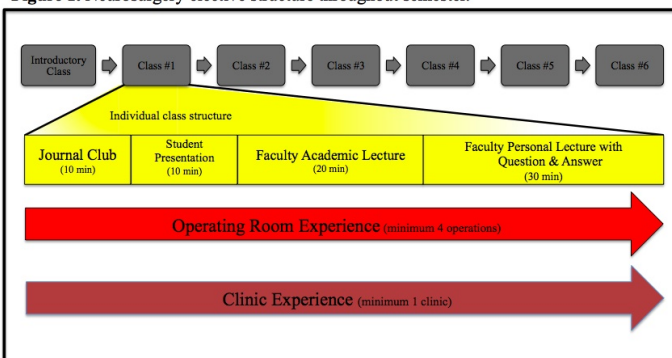


Table 1. Pre and post-elective survey averages and standard deviations with paraphrased questions. All questions were answered on a Likert scale ranging from 1-10; refer to Figure 2 for complete set of questions and answers.

Question	Pre-Elective	Post-Elective	p-value
1. How educated do you feel about neurosurgery?	3.9 ± 2.1	8.0 ± 0.8	<0.001
2. How educated are you about areas of neurosurgical research?	4.1 ± 2.4	7.8 ± 1.0	<0.001
3. How educated are you about a career in academic vs. private practice?	3.0 ± 1.7	7.3 ± 1.4	<0.001
4. How strongly are you considering neurosurgery as a future career?	6.4 ± 1.8	7.9 ± 1.1	<0.001
5. How diverse are neurosurgical operations?	7.5 ± 1.6	8.9 ± 1.0	<0.001
6. How bright do you perceive the future of neurosurgery?	7.4 ± 1.6	8.3 ± 1.3	0.046
7. How do you perceive the outcomes of neurosurgical patients to be?	5.5 ± 1.3	6.7 ± 1.0	0.001
8. How emotionally draining is field of neurosurgery?	7.9 ± 1.5	6.8 ± 2.2	0.090
9. How difficult do you perceive neurosurgery training to be?	8.7 ± 1.0	8.9 ± 1.0	0.617
10. How do you perceive personalities and collegiality between faculty to be?	6.5 ± 1.5	8.1 ± 1.3	<0.001
11. What is the financial security of a neurosurgeon?	8.4 ± 1.1	9.3 ± 0.8	0.002
12. How do you perceive the quality of life of a neurosurgeon?	6.2 ± 1.8	7.6 ± 1.8	0.013
13. How achievable is it to be a neurosurgeon and have a family?	5.9 ± 2.1	7.9 ± 1.3	<0.001

## Conclusions

Our elective significantly increased knowledge across several areas, changed perception about collegiality, quality of life, and family/work balance, while not altering the student's views of the emotional toll of treating neurosurgical patients or the difficulty of training. We conclude that adopting a neurosurgery elective can significantly change attitudes about the field of neurosurgery in a group of preclinical medical students and has potential to increase interest in pursuing a career in neurosurgery.

## Learning Objectives

To describe in granular detail how to start a neurosurgical elective for preclinical medical students.

TOPICS	FACULTY	SPOTLIGHT / RESEARCH
Introduction to Neurosurgery <i>Course Nuts and Bolts</i>	Zuckerman/Mistry Feb 6 <sup>th</sup>	- Rish BL. The Vanderbilt University neurosurgical heritage. <i>J Neurosurg</i> . 1993 - Suk L, Tamargo RJ. Concealed neuroanatomy in Michelangelo's Separation of Light From Darkness in the Sistine Chapel. <i>Neurosurgery</i> . 2010.
Functional and Psychosurgery <i>Balancing Surgery and Research</i>	Dr. Neimat Feb 20 <sup>th</sup>	- Sathana N, Haneef Z, Stern J, Mukamel R, Behnke E, Knowlton B, Fried I. Memory enhancement and deep-brain stimulation of the entorhinal area. <i>N Engl J Med</i> . 2012 - Lin SC, Deisseroth K, Henderson JM. Optogenetics: background and concepts for neurosurgery. <i>Neurosurgery</i> . 2011. - <a href="http://abcnews.go.com/video/player/index?id=5946602">http://abcnews.go.com/video/player/index?id=5946602</a>
Spine Surgery and Outcomes <i>Humanitarian Aid and Neurosurgery</i>	Dr. McGirt Feb 27 <sup>th</sup>	- <a href="http://www.thedoctors.com/videos/101/52310">http://www.thedoctors.com/videos/101/52310</a> - McGirt MJ, Spetzoff T, Goddi SS, Cheng JS, Selden NR, Asher AL. Outcome science in practice: an overview and initial experience at the Vanderbilt Spine Center. <i>Neurosurg Focus</i> . 2013
Brain Tumors <i>Delivering Bad News</i>	Dr. Thompson Mar 13 <sup>th</sup>	- Myers J. Who He Is. <i>JAMA</i> . 2012 - Memorable stories from Dr. Thompson's career as brain tumor surgeon
Vascular Neurosurgery <i>Residency Education</i>	Dr. Mocco Mar 20 <sup>th</sup>	- Hoh BL, et al. "Higher Complications and No Improvement in Mortality in the ACGME Resident Duty-Hour Restriction Era" <i>Neurosurgery</i> . 2012 - Weaver KJ, Neal D, Hoh DJ, Mocco J, Barker FG 2nd, Hoh BL. The "July phenomenon" for neurosurgical mortality and complications in teaching hospitals. <i>Neurosurgery</i> . 2012 - Schwarz A. "Before Dementia Assistance, Help With N.F.L. Application" <i>The New York Times</i> . Jan 21, 2010
Sports Neurosurgery <i>Academic vs. Private Practice</i>	Dr. Sills Apr 10 <sup>th</sup>	- Dunn IF, Dunn G, Day AL. Neurosurgeons and their contributions to modern-day athletics. <i>Neurosurg Focus</i> . 2006
Pediatric and Peripheral Nerve Neurosurgery <i>Working with Children</i>	Dr. Wellons Apr 17 <sup>th</sup>	- Wellons JC, Tabbs RS, Pugh JA, Bradley NJ, Law CR, Grabb PA. Medial pectoral nerve to musculocutaneous nerve neurotization for the treatment of persistent birth-related brachial plexus palsy: an 11-year institutional experience. <i>J Neurosurg Pediatr</i> . 2009

