Students Are not the Only Ones to Benefit from an Undergraduate Experiential Neurosurgery Immersion Course

Gary Simonds MD, Josh Prickett DO, Cara Rogers DO, Chris Busch DO, Michael Benko DO, Brendan Klein DO, Evin Guilhams DO, Zev Elias MD, Lisa Apte MD, Eric Marvin MD, Greg Howes DO, Edgar Weaver DO, Mark Wilcher MD, Harland Sontheimer PhD

Virginia Tech Carilion Neurosurgery. Virginia Tech School of Neuroscience

Background

Physicians must be, in essence, consummate teachers. They must condense, interpret, and summarize highly complex conceptualizations for an array of consumers (patients) of tremendously varied, and often very limited, medical/educational sophistication. These concepts must be understood, processed, and acted upon by the consumer. Thus, the better the “education” from their physician, the better the consumer can participate in a truly “informed” consent, and thus, shared decision making. Neurosurgery training features a heavy focus on critical thinking, particularly with respect to surgical decision making and critical care, and on the acquisition of high-level technical skills. Little attention has traditionally been paid to the development of teaching skills in neurosurgical residents. We believe that exposure of our residents to a wide and varied array of teaching opportunities will make them better educators overall, and thus better and more efficacious providers and surgeons.

We have long involved our residents in teaching efforts with medical students, other residents, and allied-health sciences students. In 2016, we initiated an experiential undergraduate course at a major university, featuring deep immersion into the clinical neurosciences. We sought to invest our residents in the conduct of the course in order to expand their experience as educators. We felt the course provided an exceptional opportunity for residents to practice breaking down the complexities of clinical neuroscience to their more “digestible” components, for medically naïve students. Student response was most enthusiastic, and at times, rapturous. We “digested”, breaking down the complexities of clinical neuroscience to their more

Methods

In conjunction with the Virginia Tech School of Neuroscience, we designed, initiated, and conduct twice yearly, a semester-long, experiential, deep immersion, undergraduate course entitled “Clinical Neurosciences in Practice.”

In this course, our team holds weekly seminars on various nervous system disorders, their medical management, and the related socio-economical and ethical ramifications. Students prepare discussions on various disorders and evaluate and critique related scientific journal articles. Students, then spend 4-6 hours per week with our team in all activities including surgery, rounds, and consultations. They actually scrub in on several operations during the semester. Students write weekly papers on various “related questions of the week” (predominately socio-economic, ethics, and personal-response-related). They prepare personal statements and undergo mock graduate school interviews, patient encounters, and even malpractice depositions. As a “final exam”, students must give in-depth presentations on specific patients, their radiological studies, their hospital courses, and related discussions about their disorders. They are also required to take two full nights of neurological call with our team twice in the semester.

We involve our faculty and residents in every component of this unique course. They deliver the lectures and seminars. They shepherd and interact directly with the students on the in-hospital days. They act as mentors to 3-4 students per semester. The supervise the students on call. They are involved in the mock interviews and formal presentations. They help with individual essays, topic assignments and critical review of related papers.

We have evaluated the faculty, resident, and student experience via “paper and pencil” surveys (Likert Scale), interviews, and group discussions. Residents were surveyed about an array of related concepts including the impact of the course on their work schedules, their mood, their interest levels, their enjoyment of work, their comfort as educators, etc.

Results

Responses from students were uniformly positive; these have been reported in a previous presentation.

6 residents, 8 faculty, and 10 Advanced Care Practitioners were surveyed and interviewed about the course. There was little variation between the groups. Some of the responses follow.

On a 1-10 Likert Scale, 1 representing strongly disagree and 10, strongly agree:

- The course created significant additional work: 9.5 (strongly agree)
- Scrubbing students into operations is very taxing: 2 (strongly disagree)
- The course caused additional stress: 6 (neutral)
- The course is disruptive to workflow: 5 (neutral)
- The O.R. could be more welcoming to the students: 9 (strongly agree)
- I feel more frustrated on student days: 7 (weakly agree)

Results ctd.

I greatly enjoy the course: 9.5 (strongly agree)
I greatly enjoy the students: 9.5 (strongly agree)
I feel energized by the students: 9.5 (strongly agree)
I would like to teach more at Virginia Tech: 8 (moderately agree)
I feel less cynical and nihilistic with the students around: 8 (moderately agree)
I look forward to student days: 8 (moderately agree)

This course should be emulated and heralded: 9.5 (strongly agree)
I feel happier around the students: 9.5 (strongly agree)
I would like to see the course expanded: 9 (strongly agree)
I feel more energized on student days: 9.5 (strongly agree)
I feel more pride in my work on student days: 9 (strongly agree)

The course is a “win-win” for everyone involved: 10 (strongly agree)
I am a better teacher because of this course: 9 (strongly agree)
I am a better doctor because of this course: 8 (moderately agree)
I appreciate the academic title bestowed on me: 10 (strongly agree)

Some respondent quotes and observations follow:

- “The adage certainly seems to hold true that the best method to really learn something, is to have to teach it!”
- “I have learned better how to break down all that we do into simpler terms and concepts. I have already used these skills on my patients and their families.”
- “Going to the University and teaching in its classrooms makes me feel like I am a part of something much bigger- it gets me out of my isolated shell.”
- “It is amazing to see the students start to get it- start to see what we are seeing on the MRI’s, start to notice the emotional states of our patients and their families, start to understand what we are trying to accomplish in our interventions.”
- “I am a better doctor for this experience. I wish I could continue something like this throughout my career.”

Conclusions

We feel that this experience is of great benefit for all members of our team. We believe it makes them better communicators and educators. Although it adds to their workload, they uniformly enjoy the experience and wish for it to continue; in fact, they eagerly volunteer to conduct the seminars and hosts students at the hospital. They also greatly appreciate the academic titles the university has generously afforded them. As an added and important benefit, the experience appears to elevate multiple indices of wellness, and thus potentially contributes to provider resilience. We believe that resident training should involve ample opportunity to teach at multiple levels with all kinds of learners. We believe this will contribute to residents’ skills as educators, both for future generation of learners and for their patients, and will contribute to their overall wellness. We believe that neurosurgical “extra-curricular” activities such as this can be of tremendous benefit in the building of resilience and career sustainability.