

Expanding Medical Student Interaction In Neurology With A Redesigned Student Interest Group In Neurology (SIGN) Chapter

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Research article

Keywords: Neurology, Medical Education, Undergraduate Curriculum

Posted Date: June 19th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-25197/v1>

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Version of Record: A version of this preprint was published at BMC Medical Education on April 17th, 2021. See the published version at <https://doi.org/10.1186/s12909-021-02641-8>.

Abstract

Background: SIGN chapters across the country provide opportunities for medical students to participate in clinical, research, and service activities in neurology. Despite these, enrollment in SIGN chapters has been traditionally low.

Methods: Following changes were introduced: an open board style SIGN chapter executive committee with greater active engagement of first and second year students, new types SIGN chapter activities including journal club articles, hands on workshop (example EMG), celebration/cause events (example ALS walk). In addition, a free neurology clinic was introduced. Activities were planned in consultation with office of medical education, and were organized during 'down times'. Data on student enrollment, activities successfully carried out, students interested in neurology residency, number of neurology-related research projects with student involvement were collected prior to changes and compared to values after changes were introduced.

Results: Post intervention, student engagement in neurology activities and projects increased significantly. There were also significantly more students engaged in neurology related research projects and significantly more students reported interest in neurology. However, a similar increase in applications to neurology residency was not yet observed.

Conclusions: An open chapter with early engagement and involvement of first and second year medical students, creating a variety of chapter activities with greater hands on involvement, planned in conjunction with office of medical education has reinvigorated our SIGN chapter.

Background

Student Interest Group in Neurology (SIGN) chapters across the country provide opportunities for medical students to participate in clinical, research, and service activities in neurology. Despite this, enrollment in SIGN chapters has been traditionally low. Ralph Jozefowicz defined the term 'neurophobia' as a fear of the neural sciences and clinical neurology that is due to the students' inability to apply their knowledge of basic sciences to clinical situations¹. This is often used to explain medical students' poor understanding and interest in neurology. It was emphasized that integrating basic science and clinical neuroscience is the key to curing 'neurophobia.' Exposure to clinical aspects and latest treatments in neurology outside the regular medical school curriculum to pre-clinical/clinical students to the clinical aspects of neurology will be able to help students not only better understand neurology, but also make them more likely to consider a career in this field. The students, faculty, and staff working together made efforts to revitalize their local SIGN chapter. With these changes, we aimed to increase participation in the SIGN chapter and the number of students applying for neurology residency.

Methods

We employed 4 major components of change including: expanding the leadership, early engagement of students, scheduling around school activities, and offering a variety of activities.

Changes in SIGN executive committee:

The SIGN executive committee was re-organized as an open-board style executive committee with greater engagement of first and second year students. We created an executive position exclusively for the first and second year students to allow for pre-clinical students to get involved in the group. The board consisted of primary positions of president, vice president, treasurer, secretary, and medical student committee representative. It was expanded with the addition of preclinical years class representative, community outreach chair, and secondary positions for any of the previously listed positions. Each position has their own tasks along with specific events to organize over the year. This kept the members actively involved, didn't overload any one member of the board, and allowed for a variety of events covering a variety of interests.

Early engagement of students with continued involvement:

We engaged students early with events that introduced students to the field along with the faculty and events that overlapped with multiple interests. Continued involvement was encouraged by providing research opportunities, starting a student run free neurology clinic for the community, and organizing community service events.

For research, we compiled a concise summary of research opportunities with faculty within our institution and research programs at outside institutions. This list was sent to the SIGN chapter email group. Another major project was starting a free neurology clinic for uninsured patients which worked with the preexisting student run clinic at our institution. The neurology clinic is held once per month and consists of teams of one pre-clinical student paired with a clinical student who see patients. The students then present to attending and resident neurologists. We placed a special emphasis on allowing the first and second year students to lead the patient encounter as much as they felt comfortable.

Activities to Pique Student Interest:

A variety of events were held throughout the year to engage students. This first event of the year was an informal event at a local restaurant with neurologist representing various sub-specialties.

Interactive labs were held in partnership with local biotechnology companies to provide simulated cases and experiences for students. We were able to work with companies through our faculty to have simulated interventional neurology event. Another event involved practicing botulinum toxin injections and Lumbar punctures. During the events students were able to work with simulations that were brought in by the outside company.

Patient experience panels were held featuring patients with neurologic disorders sharing their outlook and answering questions about their experience. This was possible by working with the faculty at our

institution or neurology clinics in the surrounding areas. The Neurologists were able to assess which patients would be interested in speaking with students.

Community service events were held including raising money and awareness for the ALS foundation by participating in the annual ALS walk. We subsequently helped organized a MG walk. We also held a community outreach event at a local daycare center where we taught elementary to middle school kids about being a physician and basic physical exam skills.

To aid in preparation for exams and step 1, we held localization cases in small groups. In addition, we held a video review session covering commonly tested principles. We also carried out various journal club discussions pertaining to issues in neurology. We also had an on-site skills lab to help students learn and participate in an electromyography and nerve conduction studies.

Scheduling around School Activities:

A major barrier of student participation is conflict with other school activities. We scheduled events during lunch hours, in the evenings. Our school employs an 8-week block system with exams at the end. We scheduled activities during the first four weeks to avoid the latter weeks when students focused on exams.

Data Collection and Analysis:

Planned activities were carried out during the 2015–2018 calendar years. The following parameters were compared: student enrollment, activities planned and successfully carried out, Students interested in neurology residency, number of neurology-related research projects with student involvement.

Student enrollment in the SIGN chapter was determined by the students on the email list. Students would sign up to be on the email list during the opening meeting or could email an executive member to be added. The number of students interested in neurology residency and number of neurology-related research projects were determined by informal polling during the various SIGN events throughout the year. The data was analyzed using linear regression with P value of 0.05 considered significant. We assessed whether or not there was a positive linear relationship between the data over time.

Results

There was a significant increase in student enrollment, with over 50% of members being 1st and 2nd year students, as well as a significant increase in students involved in research and students interested in neurology. Initially, fewer than 5% of the school was engaged with SIGN events. That grew to over 22% after changes were made (Table 1). The SIGN organization carried out many more events carried out throughout the year with the new structure as well while involving more neurology faculty members. However, there was not a significant increase in students applying and matching into neurology residencies. From 2014 to 2019, the number of students applying to neurology residency were 2, 1, 4, 2, 2,

and 6 (P = .197). The significant increase in interest in the field has not immediately resulted in significantly higher neurology applicants.

Discussion

An open chapter with early engagement of students, strategic scheduling of events, and hosting a variety of activities has significantly increased the student and faculty involvement in our SIGN chapter. We hope to encourage other SIGN chapters to implement these changes to increase interest and participation.

The number of students applying for neurology residency (nationally) has remained stable at 2.5%.² However, the AAN's Workforce Task Force found that the US is currently experiencing an 11% shortfall in the number of neurology needed for patient care will grow to 19% by 2025.² Given this growing gap in care for neurologic issues, significant changes have been made to the AAN SIGN program in order to identify activities that better engage students.³

We found that students who were most likely to apply to neurology residency tended to be interested in the field during their pre-clinical years. The class of students with the highest number of students applying to neurology tended to have the highest number interested in neurology before third year of medical school began. We saw that students often did not pick their field as neurology in their third year as we expected, but were already leaning toward this area before their clinical years. Often times, students who were interested in neurology switched fields during their third year clerkships. Students have often cited general perception of high burnout, lower pay, and fewer treatment options as the reason for avoiding neurology. We are unable to change the general perception of the field, but can increase exposure to the field for younger students so those that are interested do not miss out.

Conclusion

The interventions made to the SIGN chapter at our institution has increased exposure to neurology to a significant amount of medical student. Having a higher number of students enter their clerkship years with previous exposure to neurology led to much higher engagement. This has not immediately led to a significant increase in neurology applicants. However, it has provided insight into the path many students take when moving toward neurology as their chosen field.

Abbreviations

AAN – American Academy of Neurology

ALS – Amyotrophic Lateral Sclerosis

EMG – Electromyography

MG – Myasthenia Gravis

Declarations

Ethics approval and consent to participate

Not applicable. This was a quality improvement project for medical student education. Approval would be unnecessary according to national regulations (Code of Federal Regulations 6 §46.104 – Exempt Research).

Consent for publication

Not applicable

Availability of data and material

All data generated or analyzed during this study are included in this published article.

Competing interests

Dr. Raghav Govindarajan serves on the advisory board of Alexion Pharmaceuticals.

Dr. Rohit Gummi has no competing interests to declare. Dr. Ross Smith has no competing interests to declare.

Funding

The interventions in this study were possible due to funding available from the department of Neurology at the University of Missouri and American Academy of Neurology.

Authors' contributions

RRG analyzed the data, interpreted the data, and was a major contributor in writing the manuscript. RS set up the intervention, collected the data, and a major contributor in writing the manuscript. RG organized the interventions and assisted in collection and analysis of data. All authors read and approved the final manuscript.

Acknowledgements

Not applicable

References

1. Jozefowicz RF. Neurophobia: the fear of neurology among medical students. *Archives of Neurology* 1994;**51**:328-329.

2. Sacco RL. *Growing our Workforce to Meet the Rising Demands for Neurological Care*. President's Column 2017 [cited 2019; Available from: <https://www.aan.com/AAN-Resources/Details/about-the-aan/board-of-directors/presidents-column/october-2017-growing-our-workforce-to-meet-the-rising-demands-for-neurological-care/>].
3. *2018 Annual Report*, A.A.o. Neurology, Editor. 2018: AAN.com. 6.

Tables

Due to technical limitations the Table is available in the Supplementary Files.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Table1.pdf](#)