Our Mission

Brain and Spine Group is dedicated to improving brain and spine health globally through education, research, and community service.
Dear Supporters,

Your continued support throughout the 2023 - 2024 academic year has a lasting impact by training brain & spine care providers around the world and inspiring student-led research that will become the technical and scientific advancements of tomorrow. Thank you for believing in our vision and helping our organization remain nimble yet effective. Enclosed is a detailed outline of the past year in review. Among these are a few key milestones that we’re particularly proud of:

- Sustained and Expanding Global Education.
  - 706 hours of live-streamed educational and professional development content.
  - 7,500 new subscribers to our YouTube channel and 802,867 annual views.
  - Date set for September 7, 2024 In-Person Medical Student Neurosurgery Training Camp
  - Please see Attachment 1 for full Annual Education Program Summary.

- Three Distinct & Unique Research Teams - Increased from two.
  - 17 Peer-Reviewed Manuscripts Published
  - 5 Abstracts Accepted & Presented at National Conferences
  - Please see Attachment 2 for full Annual Research Program Summary.

- Our vision for empowering our mission through technology has completed a significant portion of the initial platform deployment phase and is transitioning to semi-public testing.
  - BSG Learn - Our brand new online learning system is LIVE at learn.brainandspinegroup.org
  - BSG Data Center - Our Research Data Warehouse, Catalog, and Statistical Processing Systems are LIVE at data.brainandspinegroup.org
  - BSG Work - Our custom Research Team & Project Management platform has been prototyped and undergoing preparation for server development.
  - Please see Attachment 3 for full Technology Program Summary.

Thank You
A significant amount of work has been done behind the scenes this past year to position Brain & Spine Group for an impactful 2024 Summer and 2024 – 2025 academic year. Our immediate next steps include:

1) Expanding Global NeuroEducation by increasing course offerings through our new online learning system – BSG Learn.

2) Increase student research productivity with newly available data assets and research support tools.

3) Improve in-house technology development with updates to existing systems and addition of new technologies to further our education & research capabilities.

Attachment 4 includes a full outline of our 2024-2025 Strategic Plan.

We are extremely grateful for this past year of support. We have seen much operational change this year as we adapt in a dynamic world, yet we ensure these changes always point toward a steadfast mission to improve brain & spine health globally through education, research, & community service.

We hope the impact outcomes enclosed are duly satisfying and show clear evidence of a bright future for our organization. Again, thank you for your unwavering support; we look forward to continuing our partnership in improving brain and spine health.

Sincere Regards,

Ryan E. Radwanski, MD
Co-founder and CEO, Brain & Spine Group
Sergeant USMC, OEF Afghanistan ’10, Cornell University ’16, Weill Cornell Medicine ’20
2023–2034 Education Program Summary

YouTube Video Library: Continued Engagement

In the 2023–2024 academic year, our team has been actively maintaining and expanding our YouTube Video Library to continue its service as a resource to students interested in careers in neurosurgery. This included reorganizing existing content into functionally distinct playlists to help make our content more accessible and useful for our audience. In 2023 and 2024 combined, we live streamed over 706 hours of content including new professional development discussions, clinical presentations, and community education videos. The impact of this is evident in our expanded reach during this period: an addition of nearly 7,500 new subscribers to our channel and 802,867 views of our video content.
Perhaps the most exciting educational development of the 2023-2024 academic year is the development of Brain & Spine Group’s own online learning management system, BSG Learn. This system, constructed on the Open edX platform, will allow our team to deliver high quality, tailored learning experiences for our audience. BSG Learn will serve as the primary platform for delivery of self-paced courses covering a range of clinical, professional development, and research topics relevant to the clinical neurosciences. We are currently wrapping up development of an “Introduction to Biomedical Research” course which is geared towards students entering early research experiences. The course covers key topics in clinical research such as: developing a research question, conducting a literature review, preparing research proposals and/or IRB applications, accessing and collecting data, and high-yield statistics. This course will be rolled out early this summer among the incoming cohort of NERVE students as they prepare to engage in mentored neurosurgical research. Students using BSG Learn will receive individualized profiles allowing them to save their progress and select courses based on their interests and needs. To this end, BSG Learn will become a “one stop shop” for students to engage with learning experience and track their progress toward their academic and career goals.
Medical Student Neurosurgery Training Camp

We are currently finalizing plans for the 2024 Medical Student Neurosurgery Training Camp which will take place on Saturday, September 7. This year’s course will be held at the Mayfield Surgical Innovation Center, a state of the art lab facility in Cincinnati, Ohio. The hybrid nature of the training camp will combine the best of what Brain & Spine Group has to offer – expertise in virtual programming and hands-on skills acquisition. The virtual component will consist of didactic content including an overview of the residency match process, neuroanatomy and radiology, and perioperative management of the neurosurgical patient. The in-person portion will be focused entirely on experiential learning and hands-on skills. Students will be introduced to the operating room (OR) environment with a review of proper OR etiquette, neurosurgical instrumentation, and scrub techniques. Expert faculty will demonstrate techniques for safe and effective positioning of patients for common cranial and spinal procedures. Similarly, the anatomic approaches for these procedures will be demonstrated on cadaveric specimens. Finally, students will be given the opportunity to learn and practice key surgical and endovascular skills including wound closure, placement / removal of ventricular and lumbar drains, and obtaining arterial access for catheter placement.
Brain and Spine Group continues to expand our research efforts with the goal of providing research opportunities and research education to students interested in the neurosciences and related specialties. These efforts include significant growth of the Neurosurgery Education and Research Virtual Experience Group (NERVE), continued productivity of the Radwanski & Pannullo Research Team, and the establishing of a new research team in collaboration with faculty of Mayfield Brain & Spine.

As the largest BSG research team, NERVE’s mission remains the provision of a multi-institutional forum for shared objective mentorship. NERVE’s recruitment efforts focus on disadvantaged students, with preference given to students interested in the neurosciences and neuro-related specialties who:

1) Do not have a home residency program and/or a national organization chapter (AANS, AAN, etc.) in their specialty of interest at their home institution
2) Are underrepresented in medicine/their specialty of choice
3) First generation medical students
4) Are currently enrolled in their first through third year of medical school or in research fellowship years.

NERVE’s annual development program focuses on five competency domains:
1) Research Skills and Scholarly Activity,
2) Clinical Knowledge
3) Professional Development
4) Technological Literacy and Resource Management
5) Technical Skills.
Since its inception and particularly over the last year, NERVE has enjoyed continuous growth in both student members and institutions represented.

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<th>ACADEMIC YEAR</th>
<th>NUMBER OF MEMBERS</th>
<th>INSTITUTIONS REPRESENTED</th>
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<td>34</td>
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NERVE is primarily student led with senior students mentoring incoming members throughout the research process. Additionally, NERVE has increased its faculty and resident involvement over the past year, including the addition of Dr. Randy D’Amico (Lenox Hill Hospital/Northwell Health) as Faculty Director as well as Dr. Alvan Ukachukwu (Duke University) as a Faculty Advisor.

As a result of increased student interest as well as faculty involvement, NERVE has published over 15 articles in the 2023–2024 academic year. The NERVE Program’s full citation list is enclosed below.

Additionally, BSG’s Radwanski & Pannullo Research Team continues their productivity under the guidance of BSG Co-founder and CEO Dr. Ryan Radwanski and Co-founder Dr. Susan Pannullo (Cornell University). Over the past year this team has published 2 peer-reviewed manuscripts with 5 abstracts selected to present at academic conferences.

The most recent addition to BSG’s research mission includes our Mayfield Brain & Spine research team. Under the mentorship of Mayfield Brain & Spine faculty, we have established a student-led research team (~4 students initially) that will work with a combination of BSG and Mayfield Brain & Spine data assets to conduct meaningful research projects. We intend to expand this team in the coming year as more faculty and data resources become available.
Attachment 2

2023–2034 Research Program Summary

NERVE Program 2023–2024 Citations:


Brain & Spine Group’s Technology Team and operational program is the newest formal group of the organization. The technology team exists to provide infrastructure, tools, and assets that directly support the education, research, and administrative operations needed to firmly achieve our mission to improve brain & spine health globally.

Our Team

**Ryan E. Radwanski, MD**  
Team Lead  
Lead Software Engineer  
Data Engineer  
Clinical Consultant

**Henry Melendez**  
Software Developer & Data Engineer

**James Haas**  
Senior Advisor: Data Analytics & Architecture
Our Technology Ecosystem

**BSG Learn** provides global access to world class education. Leveraging the OpenEdX open-source code base, the BSG Tech team has deployed and manages this platform on Amazon Web Services.

**The BSG Data Center** is a collection of software layers assembled by our technology team that allows for ingestion, storage, and lightning-fast access of research data. In addition, the team has incorporated statistical packages to reduce the distance between data storage and data analysis.

"We’ve made millions of rows of data nothing more than a google search away for BSG Research Teams."

**BSG Work** is a custom built research team, project, and task management platform.

- Facilitates student & mentor collaboration.
- Improves research project completion and handoff.
- Combines high-level oversight and individual focus.
2024–2025 Strategic Plan

1 **BSG Learn**

**Summer 2024**: internal student beta testing, limited public material for browsing.

**Winter 2025 onward**: regular release schedule for new courses.

**Fall 2024**: public launch of initial courses.

2 **Research**

**Provide Live Data & Statistical Support** for student-led research projects via data.brainandspinegroup.org

**50+ NEW research students** starting with Brain & Spine Group’s NERVE program.

**Mayfield Education & Research Foundation** student research team to begin meeting and initializing first projects.

3 **Technology**

**Ingest New Data Assets** to significantly increase the amount of data available in our warehouse for research projects.

**Increase self-service capabilities** by reducing the technological barriers to searching, preparing, and analyzing data by leveraging GPT/LLM-based interfaces.

**Launch custom Research Team & Project Management platform.**

**Secure salary lines** for 1 full-time software engineer and 1 part-time software engineer.
We thank you for your ongoing support of Brain & Spine Group

Acknowledgements

Brain and Spine Group would like to thank our network of donors and volunteers who selflessly give their funds and time in pursuit of a shared mission to improve brain and spine health globally.

Thank you to Michael Rallo, and Nikki Barrington for their volunteer leadership that ensures quality, free educational programming and student-driven research remains at the forefront of our mission.