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Editorial

Honoring the legacy: bridging the pioneering foundations of neuroanatomy and the future of neurosurgery

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Introduction

In the *Neurological Surgery and Anatomy* initial two issues, we are reminded of the essential duty of our generation to honor and uphold the legacy of pioneers whose groundbreaking work laid the foundation for modern neurosurgery. Our discipline has transformed dramatically over the past century, evolving from high-risk, limited-access procedures to an advanced field where technology enables precise access to the brain's most challenging regions. Today's sophisticated imaging, microsurgical techniques, and endoscopic tools enable neurosurgeons to approach complex cases with unprecedented accuracy and safety. However, these advancements stand on the shoulders of historical giants whose dedication to exploring and mapping the intricacies of the nervous system transformed neurosurgery into the refined discipline it is today. This journal is dedicated to remembering these figures and advancing their vision by promoting knowledge and innovation within neuroanatomy and neurosurgery.

Foundational figures in neurosurgery

Our journal highlights the critical contributions of several influential figures whose work continues to inspire. Among these pioneers is Sir William Macewen, regarded as the "Father of Modern Brain Surgery." Practicing in the late 19th century, Macewen revolutionized neurosurgery by pioneering methods for accurately localizing intracranial disease. His work led to the development of innovative techniques that allowed surgeons to treat brain abscesses and other conditions with remarkable precision. Macewen's *Atlas of Head Sections*, a monumental work on cranial anatomy, remains a significant reference, particularly valuable in skull base and microsurgical procedures.

Another notable figure, Thomas Willis made profound contributions to neuroanatomy with his work *Cerebri Anatome*, which provided one of the earliest comprehensive illustrations of the brain's vascular structures. Known for his meticulous descriptions, Willis is remembered today through "Willis's Circle," a structure that bears his name and serves as a foundation for understanding cerebrovascular anatomy.

Albert L. Rhoton Jr. also stands out as a visionary whose intricate dissections and anatomical insights set a new standard in cranial surgery. His work in microsurgical anatomy enhanced our understanding of cranial structures and elevated surgical precision. Through his publications and teachings, Rhoton disseminated an approach to neuroanatomy that profoundly influenced both practitioners and trainees. These figures represent a few of the many pioneers who have propelled neurosurgery forward, providing a foundation for contemporary innovation.

Eponyms in neuroanatomy: honoring contributions through naming

The journal *Neurological Surgery and Anatomy* also recognizes the lasting impact of historical contributors whose names have been immortalized in anatomical eponyms. These eponyms serve as an enduring bridge between past and present, linking the anatomical discoveries of early anatomists with the techniques we use today. For example, Thomas Willis, as noted, lends his name to "Willis's Circle," a term used to describe the critical arterial network at the brain's base. Other eponyms in cerebrovascular anatomy and neuroanatomy include Arnold's nerve, named after Friedrich Arnold, a

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prominent 19th-century anatomist, and the sylvian fissure, named after Franciscus Sylvius, whose work in cerebral anatomy set the groundwork for identifying crucial brain structures. These names are embedded in daily practice, ensuring that the contributions of these pioneers remain integral to medical education and clinical work.

In addition, eponyms like the Rolandic fissure and Broca's area honor anatomists who expanded our understanding of motor and speech regions, critical to functional neurosurgery today. These eponyms are a tribute and a reminder of the profound impact early research has had on the development of advanced neurosurgical procedures. By preserving their names, we celebrate a rich history of discovery and acknowledge the lasting relevance of these contributions.

The role of modern technology and knowledge in advancing neuroanatomy

Today's neurosurgeons are equipped with tools and technologies that early pioneers could scarcely have imagined. High-resolution imaging, neuronavigation, intraoperative monitoring, and advanced endoscopes allow for more precise and minimally invasive procedures, even in the most complex brain regions. These technologies enable neurosurgeons to reduce patient morbidity while expanding the range of treatable conditions. However, it is essential to recognize that these advancements are deeply rooted in historical anatomical research. Every technological improvement enhances our ability to map and protect critical neuroanatomical structures, reinforcing the importance of detailed anatomical knowledge.

In recent years, 3D visualization and virtual reality have brought a new dimension to neurosurgical training and planning. These tools allow surgeons to simulate complex procedures, gaining insights into each patient's unique anatomy. While these innovations are extraordinary, they rely on the foundational work of anatomists who meticulously mapped the nervous system. As we look to the future, it is essential to maintain an appreciation for this history, recognizing that the precision and capabilities we now enjoy are built on centuries of anatomical study.

As we advance further into this era of technological sophistication, we must remember that our progress is rooted in the knowledge and dedication of those who came before us. By acknowledging the achievements of visionaries such as Sir William Macewen, Thomas Willis, and Albert L. Rhoton Jr., we reinforce the importance of a historical perspective in advancing neurosurgery. Each new discovery, every innovative technique, and every groundbreaking study is a testament to the foundational work of our predecessors. This journal is committed to being more than a publication; it is a tribute to the enduring influence of these giants and a platform for pushing the boundaries of neurosurgery and neuroanatomy.

Let us celebrate this legacy as we continue to explore the complexities of the human brain, honoring the dedication, skill, and courage of those who paved the way. By building on their achievements and embracing new tools and techniques, we can elevate our field and ensure that the next generation of neurosurgeons will have an even richer foundation from which to innovate. Together, let us remember, respect, and advance the art and science of neurosurgery, bridging history and progress in each procedure, every publication, and with every contribution to this noble field.

Establishing legacy and pioneering future directions in neurosurgical publications

The *Neurological Surgery and Anatomy* journal, established in 2024, emerges as a promising addition to academic publications in neurosurgery and neuroanatomy. Its foundation coincides with a period of significant advancements in neurosurgical techniques, driven by breakthroughs in technology and anatomical knowledge. The journal is well-positioned to contribute by emphasizing high-quality studies in neuroanatomy, cranial and spinal surgery, microsurgical techniques, and, notably, historical perspectives, highlighting past pioneers' contributions in shaping modern neurosurgery.

Strengths and initial contributions

Neurological Surgery and Anatomy has already established a strong foundation by focusing on key historical figures and anatomical eponyms in its first issues, which both honors legacy and contextualizes current practice within a historical framework. The journal brings a unique perspective that reinforces the importance of foundational knowledge in advancing surgical precision. This historical approach sets it apart, creating a bridge between foundational discoveries and current innovations in neurosurgery.

The journal also offers a valuable platform for contributions from seasoned professionals and new researchers, enhancing its inclusivity and academ-

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ic diversity. Additionally, as an open-access publication, it reaches a broader audience, including practitioners, academics, and students globally, democratizing access to advanced knowledge in neuroanatomy and surgical technique.

Challenges and areas for development

Like any new publication, *Neurological Surgery and Anatomy* faces the challenge of establishing credibility and visibility in a highly competitive field with established journals. To secure a lasting presence, it must focus on rigorous peer-review processes, maintaining high standards for quality and innovation, and ensuring contributions from internationally recognized experts in neurosurgery and anatomy. As the field is data-driven and precision-oriented, the journal's ability to provide cutting-edge research backed by empirical data will be crucial.

Another potential challenge is balancing historical content with novel, forward-looking studies. While historical articles add depth and perspective, the journal will need to balance this with contemporary research to remain relevant. Including more clinical trials, technological assessments (e.g., neuronavigation, intraoperative imaging), and studies on emerging techniques like robotic-assisted surgery will increase its impact.

Projections for the future

Looking forward, *Neurological Surgery and Anatomy* could become a central publication for both seasoned neurosurgeons and younger professionals by evolving with the field's demands. As neurosurgery increasingly intersects with fields like artificial intelligence, virtual reality for training, and precision medicine, the journal has an opportunity to broaden its focus and attract multidisciplinary contributions. Special issues dedicated to these advancements could position the journal as a pioneer in translating cutting-edge research into clinical practice.

Furthermore, by actively engaging with academic institutions and neurosurgery conferences, the journal can increase its visibility, fostering a community of practitioners who contribute to and benefit from its publications. Collaborations with neurosurgical societies, a robust editorial board, and special editions on current topics could enhance its reputation and authority.

In conclusion, *Neurological Surgery and Anatomy* has a strong foundation and promising outlook. With a strategic focus on quality research, technological advancements, and a balance between honoring history and driving innovation, it has the potential to become a respected, influential publication in the field.

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