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Commentary: The History of Neurosurgery at Albany Medical College and Albany Medical Center Hospital, Albany, New York

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The origins of the Department of Neurosurgery at Albany Medical College closely parallel the development of early America and the establishment of modern health care. The tales of Washington Irving, the works of the Hudson River School of painters, and summers in the Catskill Mountains or Adirondacks are the stories that color the history of Upstate New York (Figure 1). As a social, industrial, and political hub of the American colonies, New England's need for centers providing structured medicine led to the creation of Albany Medical College in 1839, one of the earliest such institutions in the young nation.¹ Rapid progress in nearly every other realm of life required medical advancements as well, prompting subspecialization and the development of neurosurgery in the region.

EARLY REGIONAL HISTORY OF UPSTATE NEW YORK

In 1609, the Dutch had claimed New Amsterdam as their first colonial outpost. That same year Henry Hudson sailed his ship, *Halfmoon*, up the Hudson River in search of a Northwest Passage to the Orient. The fur-trading post of Beverwyck was established 100 miles to the North of New Amsterdam. In 1624 a fort was constructed at this site named Fort Orange—currently the location of downtown Albany, New York. When England seized control of New Amsterdam in 1664, the British renamed New Amsterdam as New York, and Fort Orange as Albany. As these towns grew industrially, medical providers began to gravitate to the region.²

In 1806, the Albany Medical Society was started. Dr Alden March arrived in Albany in 1821 after completing his medical training in Rhode Island, and founded Albany Medical College—the oldest medical school in the United

States—in 1839 (Figure 2). Albany Medical College opened its doors for medical training in 1839, and by 1849 Albany Hospital provided patient care.

GROWTH OF ALBANY MEDICAL COLLEGE

Dr Henry Hun brought Neurology to Albany in 1885. He obtained his MD from Harvard University in 1879, and returned to Albany after studying with Charcot in Europe. He served as Chairman of the new Department of Neurology until 1914. His son, Dr Henry Hand Hun, earned his medical degree from Harvard, spent time on the faculty of Johns Hopkins Hospital, and returned to Albany to become an instructor and surgeon in 1912.

During the early 1900s, newly educated faculty from Johns Hopkins School of Medicine began migrating to Upstate New York. As a result, Albany Medical College came under the indirect influence of the four “giants of medicine” of that time, namely Drs William Welch, William Osler, William Halstead, and Howard Kelly. Dr Arthur Elting, an 1898 graduate of Hopkins, was named the new Chairman of the Department of Surgery in 1915.³ He had trained under Halstead and Welch, and served as Chief Surgeon of Albany Hospital for many years. He quickly realized that he needed to make Neurosurgery available in Albany and worked with Dr Walter Dandy, then head of Neurosurgery at Johns Hopkins. Dr Dandy encouraged his chief resident, Dr Eldridge Campbell, to come to Albany.

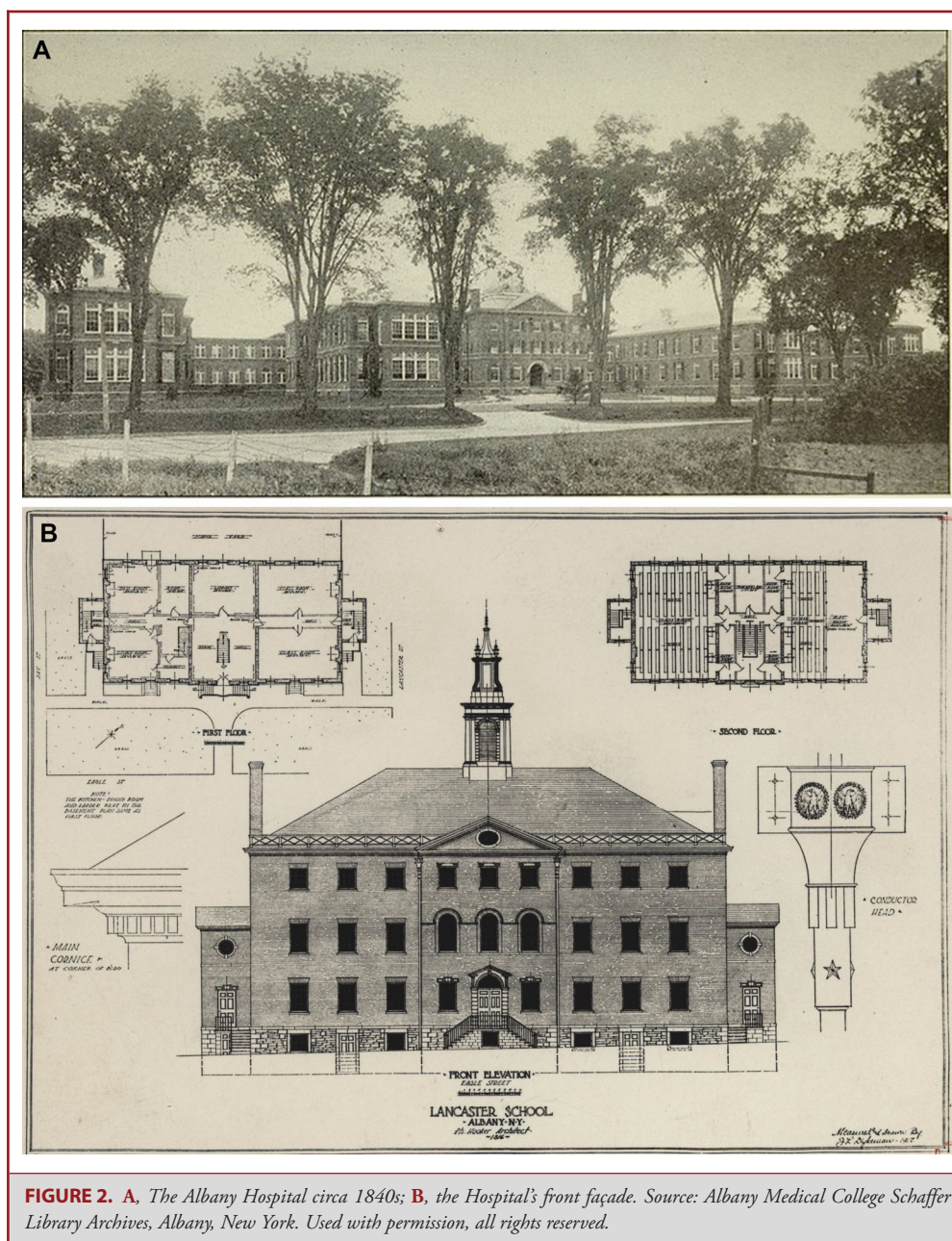
EARLY DAYS OF “MODERN” NEUROSURGERY IN ALBANY

Dr Eldridge Campbell, a Rhodes Scholar, received his doctorate from Johns Hopkins in 1927 (Figure 3). He was mentored under Dr Walter Dandy until 1934 when he joined the Albany faculty. Dr Campbell was appointed

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FIGURE 1. A, Fort Orange 1635, First permanent Dutch settlement in NY State located in the present day city of Albany. **B,** Return of the Experiment 1787, Homecoming of the sloop "Experiment" to City Hall Dock in Albany, NY following its voyage to China 1785-1787. (Source: Permission of artist Len F Tantillo and personal collection of Dr Semenoff)



as the Chairman of the Sub-Department of Neurosurgery. He became recognized internationally as a leader in the field. Dr Campbell had a strong interest in hunting, fishing, and tennis, all of which could be pursued by living in Albany. He was an excellent teacher and demanded high academic and surgical standards of his staff.^{4,5}

World War II temporarily interrupted Dr Campbell's pursuits; in 1942, he was appointed as the Surgeon in Chief of the 33rd General Hospital and neurosurgical consultant for the US Army's

Mediterranean theater of operations. He was awarded the Legion of Merit at Caserta, Italy, in 1945. He then returned to Albany where he was appointed Professor of Surgery and Chairman of the fledgling Neurosurgery department.

Afterwards, he formalized the residency training program and was one of the founding members of the AOA Theta Chapter at Albany Medical College. The additions of doctors Robert D. Whitfield in 1947 and William Kite in 1950 expanded and diversified Dr Campbell's Neurosurgical Sub-Department. Numerous

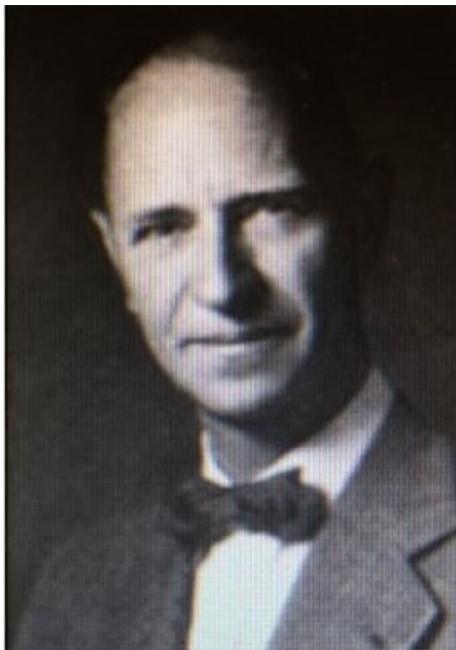


FIGURE 3. Eldridge Campbell, MD. Source: Albany Medical College Schaffer Library Archives, Albany, New York. Used with permission, all rights reserved.



FIGURE 4. Lieutenant General Paul W. Myers, MD. Source: Albany Medical College Schaffer Library Archives, Albany, New York. Used with permission, all rights reserved.

articles were published in the 1950s under his leadership, though his tenure was cut short by an untimely death, succumbing to cerebral hemorrhage at the age of 55 in 1956.

GROWTH, DEVELOPMENT, AND KEY FIGURES

The addition of faculty from around the country continued to diversify Albany's neurosurgical program, improve the quality of resident education, and increase the scope of neurosurgical procedures performed.

Lieutenant General Paul W. Myers, MD (1923-2003) completed his Neurosurgical training in Albany in 1956 (Figure 4). In 1958, Dr Myers became director of Neurological Surgery at Wilford Hall, USAF Medical Center at Lackland AFB, Texas. From 1971 to 1978, he served as a commander and Surgeon General of the United States Air Force and was actively involved in NASA's Project Mercury.

Dr Arthur O. Schilp (1924-2006) participated in the training of over 40 residents in Albany (Figure 5). He was an accomplished tennis player, and represented Holland as a Davis Cup tennis contender in his youth, though World War II put an end to this endeavor. He completed his Neurosurgical residency at Albany Medical Center in 1958 and subsequently went into practice with Drs Robert Whitfield and Fremont C. Peck Jr

Fremont Carson Peck Jr (-1994) trained in medicine at Cornell Medical College under Dr Bronson Ray. He studied

endocrinology under Dr Olaf Pearson, which he brought to Albany. At that time, transsphenoidal pituitary ablation was being used as adjuvant treatment for breast cancer. In 1962, Jules Hardy had introduced transsphenoidal surgery as a treatment for pituitary tumors, and Dr Peck soon adapted this technique in the 1960s. Drs Peck and Schilp became close personal friends and colleagues. They practiced together and helped educate many residents. They were among the first to study and report the family lineages of Dutch descendants afflicted with the neurosurgical manifestations of Von Hippel-Lindau's disease.

Richard Allan Lende, MD (1924-1973), was born in Canby, Minnesota, in 1924 (Figure 6). He earned his doctorate in 1951 from University of Oregon Medical School. At the University of Wisconsin he trained with C.N. Woolsey and developed an interest in cerebral localization. He continued with his neurosurgical training at the Montreal Neurological Institute under Drs Wilder Penfield and Thomas Rasmussen.⁴ In 1965, he was made Professor and Chairman of the Division of Neurosurgery at Albany. Dr Lende loved skiing, hiking, photography, and painting, and life in Upstate New York suited his lifestyle. He became a world authority on cerebral cortical localization, until his death in 1973. His scientific pursuits resulted in 42 publications in clinical neurosurgery and the related basic neurosciences. To this day, his memory lives on with the Annual Richard Lende Neurosurgery Conference sponsored by the AANS at Snowbird, Utah. Dr Lende recruited James Ernest Mincy (1934-present),

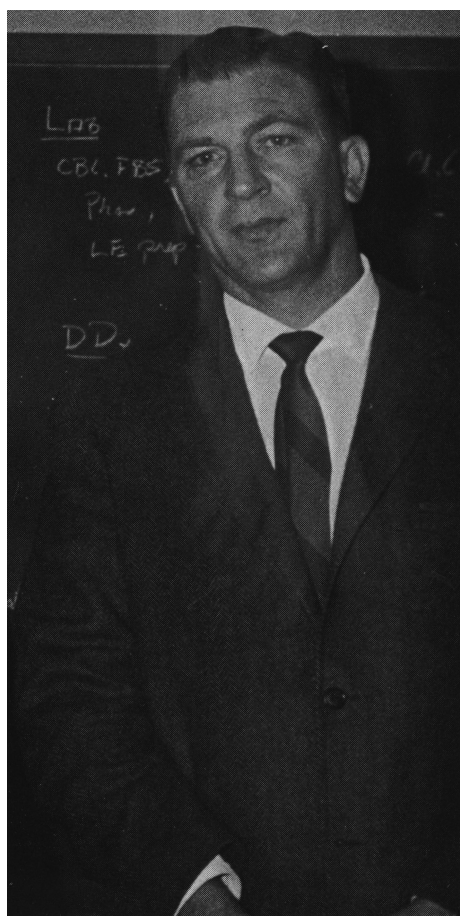


FIGURE 5. Arthur O. Schilp, MD. Source: Albany Medical College Schaffer Library Archives, Albany, New York. Used with permission, all rights reserved.

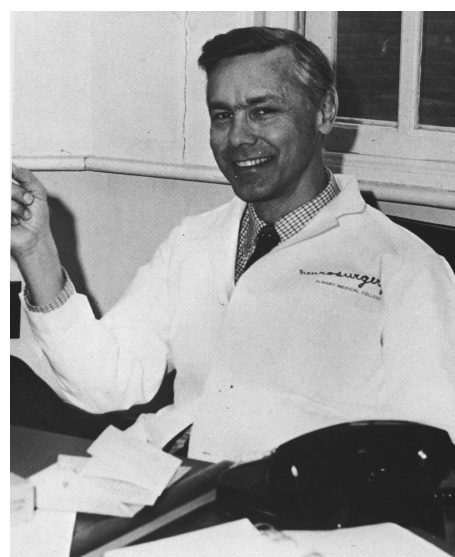


FIGURE 6. Richard A. Lende, MD. Source: Albany Medical College Schaffer Library Archives, Albany, New York. Used with permission, all rights reserved.

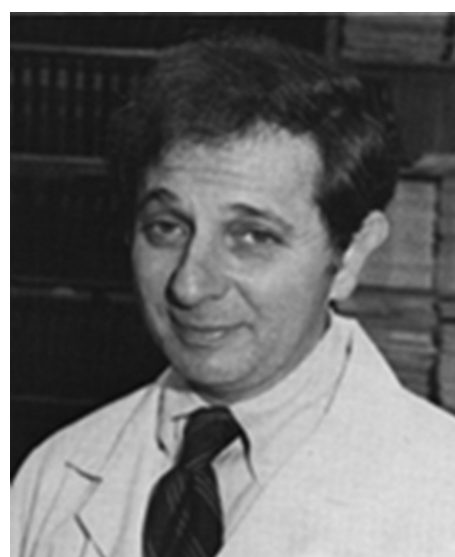


FIGURE 7. Robert S. Bourke, MD. Source: Albany Medical College Schaffer Library Archives, Albany, New York. Used with permission, all rights reserved.

whose papers on post-traumatic cerebrospinal fluid fistula are still referenced in modern literature.

Robert Samuel Bourke, MD (1935-1995) became Chairman of Neurosurgery in 1974 (Figure 7). He received his MD with honors from Tufts Medical School in 1960 before continuing in Neurological Surgery at Barnes Hospital in St. Louis, Missouri, under the direction of Dr Henry Schwartz.⁴ Dr Bourke brought to Albany a rich research background. Prior to his arrival in Albany Dr Bourke had served as acting chief at Georgetown University Hospital in Washington, D.C. (1967-1969). He served as Chief of Neurosurgery at Roswell Park Memorial Institute in Buffalo, NY (1969-1974), and Chairman of Neuro A Study Section at NINCDS, NIH, where he worked in Dr Donald B. Tower's laboratory of neurochemistry, investigating cerebral cortex fluid spaces and ion transport across cellular membranes. In Albany he worked with his colleagues, Louis R Nelson, A. John Popp, and Harold Kimelberg. Together they published novel mechanisms of closed head injury, astroglial swelling, transcel-

lular sodium transport, cerebrospinal fluid production and flow, and treatments for cerebral edema and spinal cord injury. They published a novel animal model that replicated human closed-head and spinal cord injuries. The Albany neurosurgical program continued to grow and define itself as a regional and national teaching and research institution. Dr Bourke was a consultant to



FIGURE 8. A. John Popp, MD. Source: Albany Medical College Schaffer Library Archives, Albany, New York. Used with permission, all rights reserved.



FIGURE 9. Alan S. Boulos, MD. Source: Albany Medical College Schaffer Library Archives, Albany, New York. Used with permission, all rights reserved.

Merck Research Laboratories, and laboratory and clinical research studies were an active part of the program. He and other academic neurosurgeons, such as Donald Becker (Richmond, Virginia) and Robert Grossman (Houston, Texas), were considered the leaders in their fields in the 1970s. Dr Bourke left Albany in 1985.

A. John Popp (1941-present) served as Chairman of Neurosurgery from 1986 to 2009 (Figure 8). He was born in Warsaw, New York, in 1941. He received his medical degree from the Albany Medical College in 1967.⁴ He completed his General Surgery residency at the Albany Medical Center Hospital in 1969 and served as Captain in the Air Force in Tachikawa Hospital in Japan. He returned to Albany Medical Center for neurosurgical training under Dr Lende. In 1975, Dr Popp was named Assistant Professor of Surgery and Head of Neurosurgery at the Albany Veterans Administration Hospital (1975-1981). In 1986, he was named Head of the Division of Neurosurgery, and Chairman of the Department of Surgery from 1986 to 2004.

Dr Popp served as Treasurer and President of the Society of Neurological Surgeons, President of the American Association of Neurological Surgeons, President of the World Academy of Neurological Surgeons, Director of the American Board of Neurological Surgery, and Chairman of the Washington Committee for Neurosurgery. He participated in the RRC for Neurological Surgery and has served as an advisor for a National Science Foundation. Dr Popp has published on various topics, including improved patient outcomes after carotid endarterectomy, the development of neuroprotective agents for treatment of ischemic stroke, the management of vascular abnor-

malities of the brain and spine, the management of traumatic spinal injury, vascular bypass for occlusive cerebrovascular disease, treatment of cerebral vasospasm, and the workforce demands for neurosurgeons in the United States.

Alan Samuel Boulos (1970-present) was born in London, England (Figure 9). He is a third generation neurosurgeon. Dr Samuel Boctor, his grandfather, was the first modern neurosurgeon in Egypt. His father, Dr Magdy Boulos, graduated from medical school in Egypt, completed neurosurgical training in England, and moved to the United States where he practiced for 40 yr. Dr Boulos graduated from Albany Medical College in 1994 and subsequently completed neurosurgical residency in Albany and a Neuroendovascular Fellowship under L. Nicholas Hopkins at SUNY Buffalo. He returned to Albany where he created a neuroendovascular program. In 2009, (Figure Dr Boulos was appointed as Chief of the Division of Neurosurgery, and in 2013 a Department of Neurosurgery was created. This was the first surgical subspecialty department at Albany Medical College. Dr Boulos continues to publish and expand the field of endovascular neurosurgery. Research interests include new endovascular techniques and product development, the effects of intracranial stenting, neuroprotection, and surgical management of skull base tumors.

PRESENT DAY NEUROSURGERY IN ALBANY

The philosophies of Eldridge Campbell continue to permeate the Department of Neurosurgery as we progress into the 21st



FIGURE 10. A, Aerial view of Albany Medical Center late 1990s; B, and present day. Source: Albany Medical Center Library Archives, Albany, New York. Used with permission, all rights reserved.

century. Focus on clinical services, research, and education is of paramount importance. Recent advances in neurosurgery have expanded the scope of services that the department is providing to the people of northeastern New York (Figure 10).

An expansive functional neurosurgical program was developed by Julie Pilitsis, MD, PhD. She is internationally recognized for her work in functional neurosurgery. She also serves as Chair of the Department of Neuroscience and Experimental Therapeutics

at Albany Medical College. Basic science research of movement disorders, brain tumor genesis and therapeutics, neuronal cell biology, brain development, are currently investigated. Publications include treatments provided by deep brain stimulation, the treatment of tremor, facial pain, robotic systems in stereotactic neurosurgery, spinal cord stimulation, subcortical localization of pain and behavior, and the role of women in neurosurgery. The combined efforts of clinicians and scientists working collaboratively makes this department unique in searching for solutions to a variety of neurological conditions. The addition of Vishad Sukul and several other new members to the department has expanded the academic mission of neurosurgery, while simultaneously promoting the College's Junior Faculty Development Program.

Dr Tyler Kenning serves as the Director of Pituitary and Cranial Base Surgery. He established a Pituitary and Minimally Invasive Cranial Base Surgery Program and a multidisciplinary neuro-oncology Clinic. His addition led to collaborative partnerships with otolaryngology and radiation oncology. The recent addition of Dr Maria Peris-Celda, a Rhoton trained neuroanatomist and Mayo-trained cranial base neurosurgeon, has amplified the program's academic standing. Dr Peris-Celda has co-authored a textbook of neuroanatomy. Research and literature publications regarding endonasal surgery, anterior skull base reconstruction, treatment of malignant intracranial hypertension, and the development of novel endonasal approaches to the skull base have been contributed by her to the literature. A new neurosurgical anatomy laboratory hosts national and international neurosurgeons.

Dr Matthew Adamo serves as the region's only pediatric neurosurgeon. His addition has created the availability of pediatric neurosurgical procedures that previously would have had to be referred out of the region. Orbital and craniofacial pathologies are commonly treated in collaboration with ophthalmology and plastic surgery. Complex pediatric brain tumors and spinal pathologies are treated on a regular basis. Dr Adamo continues to make academic contributions regarding diverse topics including the development of extended strip craniectomy for craniosynostosis, outcomes after craniosynostosis surgery and shunting procedures, and the outcomes of pediatric patients after head injury.

Drs Darryl Dirisio, John German, David Semenoff, and Allen Carl have provided various treatments for a host of complex spinal disorders. A multidisciplinary comprehensive spine center provides a variety of surgical and nonsurgical treatments for various spinal disorders and musculoskeletal syndromes. Contributions to the literature have been made regarding mechanical loading of the lumbar spine, the development of novel techniques for the management of spinal injuries, and the treatment of scoliosis, degenerative, and traumatic conditions of the spine. Dr Dirisio regularly collaborates with colleagues at the Biomedical Engineering program at Rensselaer Polytechnic Institute in Troy, NY. Neurosurgical faculty collaborates with senior biomedical engineering students, and each Spring the biomedical engineering

students present their designs and prototypes. Dr German serves as the Department's Residency Program Director, while leading the minimally invasive spinal surgery program. His publications include topics regarding minimally invasive spinal surgery, biomechanics of spinal implants, and the management of spinal deformity and trauma.

Dr Boulos and his endovascular colleagues (Drs John Dalfino, Alexandra Paul, and Junichi Yamamoto) remain actively involved in the technological advancement of their subspecialty. We remain the only comprehensive stroke center in Northeastern New York.

The expansion of the clinical services over the past decade is also reflected in the residency training program, which has grown (**Appendix, Supplemental Digital Content**). Despite the increase in the number of residents, the clinical volume and the quality of the neurosurgical training program has only increased and improved. Each year graduating medical students, neurosurgical residents, and functional and endovascular fellows in neurosurgery become part of the AMC diaspora that accept positions through the United States and abroad.

CONCLUSION

The Department of Neurosurgery has enjoyed a rich history—from its humble beginnings to its present state that now offers comprehensive neurosurgical care across many different disciplines. Furthermore, 25% of our faculty are women neurosurgeons, reflective of the diversity we feel is needed in neurosurgical care of the future. At present, Albany Medical Center provides medical care for 25 counties in Eastern New York and Western New England. There are currently 715 hospital beds, an average daily census of 630 patients, over 30 000 surgical cases performed yearly, and over 80 000 Emergency Department visits annually. Albany Medical Center Hospital functions as a Level 1 Trauma Center.

The philosophies of Cushing and Penfield insisted that we provide excellence through our research, training, and clinical services. These tenets have been bred into the fabric of the Department of Neurosurgery at Albany Medical College. Our current faculty is diverse and brings to Albany the best of what they have learned during their formative years of neurosurgical training and the scope of their diverse practices. The Department and the neurosurgical services provided will serve the residents of Northeastern New York well into the future.

Disclosures

Dr Pilitsis is a consultant for Medtronic, Boston Scientific, Nevro, Jazz Pharmaceuticals, Neurobridge Therapeutics, and Abbott and receives grant support from Medtronic, Boston Scientific, Abbott, Nevro, Jazz Pharmaceuticals, GE Global Research, and NIH 1R01CA166379. She is medical advisor for Centauri and Karuna and has stock equity. The other authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

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Supplemental Digital Content. Appendix. Graduates of the Albany Medical Center Neurosurgical Residency Program

COMMENT

The authors provide excellent insight into the significance of Albany Medical Center and its role in the history of the early development of America. Fort Orange was founded in 1624 and became Albany in 1664, which is the capital of New York State. The medical school, oldest in the United States, was founded in 1839 and has had a distinguished history in the tri-state area of Upstate New York. The founder of the Division of Neurosurgery, Dr Eldridge Campbell, provided a firm construct upon which the department developed over the years. The tenure of Dr Richard Lende lives on and is recognized by his annual ski meeting. The importance of the work by Dr Robert Bourke and his entire staff cannot be overstated. He, along with several other neurosurgeons in the country including Dr Donald Becker, transformed our management of brain and spinal cord traumatic injury. The department continues on and flourishes with a strong clinical flavor as well as having played major roles in political neurosurgery.

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