

# Commentary: The Tulane University-Ochsner Clinic Foundation Neurosurgery Program: 75 Years of History, Including the Program's Rebirth After Katrina

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## ORIGINS OF MEDICAL AND SURGICAL TRAINING IN NEW ORLEANS

### Charity Hospital

After New Orleans was founded in 1718, sailor Jean Louis died and bequeathed his fortune in 1736 to establish a hospital for the poor of New Orleans, which would be recognized for almost 300 yr as Charity Hospital. Father Phillipe of St. Louis Cathedral and sisters of the Ursuline Convent assumed responsibility its management, and these “Daughters of Charity” continued to provide care into the modern era. Charity was the oldest continually operating hospital in the United States and had served as the training Mecca of many medical generations. Charity, “where the unusual occurs and miracles happen,” was known for providing second-to-none care for all patients while training the future leaders in medicine.

### Tulane University and the Medical School

In 1834, 2 physicians from Philadelphia who had been shipwrecked arrived in New Orleans, where they recognized the magnitude of pathology, thus opening the Medical College of Louisiana.<sup>1</sup> In 1847, the Legislature absorbed the medical school into the University of Louisiana.<sup>1,2</sup> In 1882, Paul Tulane, a wealthy New Orleans businessman, donated a large tract of land and monies to the Tulane Educational Fund, who became the trustees of the Tulane University. The legislature subsequently transferred ownership of the University to the Administrators of the Tulane Educational Fund, and Tulane University became a private institution. While the University was relocated in uptown New Orleans, the medical school remained downtown, adjacent to Charity.

In 1972, the Tulane Board of Governors approved the construction of a 235-bed hospital across from Charity to serve as a private teaching hospital; it was completed in 1976.

### Ochsner Clinic Foundation

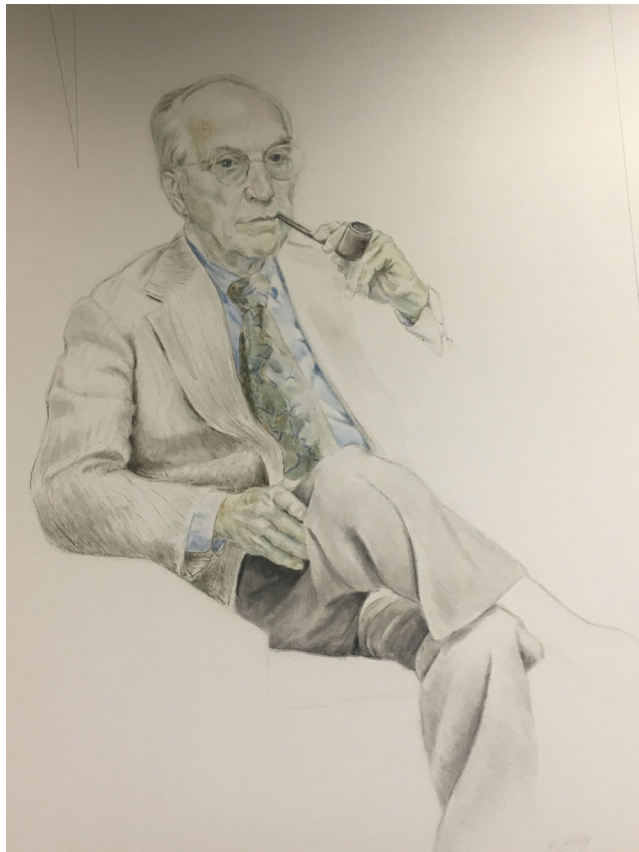
Dr Rudolph Matas, world-renowned vascular surgeon and Chairman of Surgery at Tulane and Charity, graduated from the University of Louisiana in 1880. When he stepped down as Chairman in 1927, Dr Alton Ochsner took over, making New Orleans a popular medical destination. In 1942, after a political disagreement with Governor Huey P. Long, Ochsner and 4 other Tulane department heads left to form an independent multispecialty clinic. Dr Dean Echols, a neurosurgeon that Dr Ochsner had recruited for Tulane, soon followed to join the group at the new Ochsner Clinic. As the first group practice in the Deep South, Ochsner was founded to provide a “one stop” medical center for comprehensive care from a physician group.<sup>2,3</sup>

### Veteran Affairs Medical Center

The New Orleans Veterans Affairs (VA) Medical Center began in 1946 as buildings near Lake Pontchartrain that were modified after World War II. The first formal VA hospital was opened in September 1952 as a 492-bed hospital. That facility closed in 2005 after Hurricane Katrina left the hospital's electrical equipment submerged in water for weeks. The VA clinics remained open, but Tulane contracted to provide inpatient care for veterans. In June 2006, Congress approved a new \$1 billion institution situated on 31 acres that partially opened in 2016 for outpatient and limited inpatient care. This hospital is projected to serve over 70 000 veterans.

## DEAN H. ECHOLS, MD, AND THE NEUROSURICAL TRAINING PROGRAM

Dr Echols was born in Wisconsin in 1904 and finished medical school at the University of Michigan in 1931. He completed a neurosurgical residency under Dr Max Peet. Dr Echols



**FIGURE 1.** Dr Dean Echols. Courtesy of the Tulane-Ochsner Neurosurgery Program.

was befriended by Alton Ochsner, who invited him in 1937 to practice to New Orleans. He supervised general surgery residents' neurosurgical rotations.

Dr Echols was a leader in the field; he was one of the 8 founders of the American Academy of Neurological Surgery (AANS) and its first president. Dr Echols was the first to submit a paper describing the ruptured lumbar intervertebral disc, though it was not published. He had interests in spinal surgery, syringomyelia, tic douloureux, and promoted the use of tracheostomy to manage comatose patients. Dr Michael DeBakey described Echols as "the smartest person I ever met."<sup>4</sup> He was also a remarkable gentleman; in 1950, when Ochsner had financial difficulties, Echols lived on credit rather than drawing a salary.<sup>1</sup>

Dr Echols is considered the fifth founder of the Ochsner Clinic; he started the Alton Ochsner Clinic Foundation-Affiliated Neurosurgery Residency in 1944. Furthermore, he was appointed head of Graduate Medical Education (one of the first programs in the country). The 4-year program consisted of 2 yr at Ochsner, 1 at the VA, and a final year at Charity (Figure 1).

## SPONSORSHIP OF THE NEUROSURGICAL PROGRAM MOVES TO TULANE

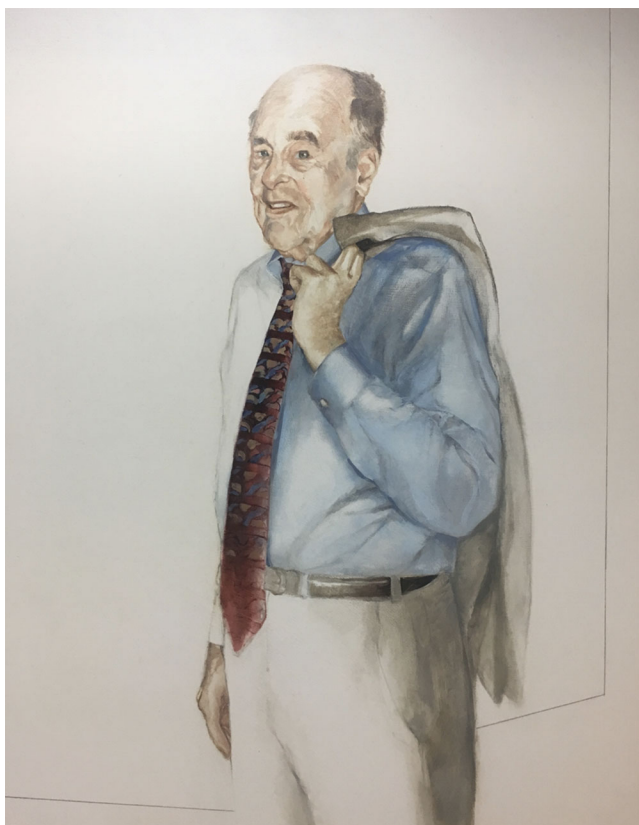
In 1959, sponsorship of the program transferred to Tulane. The staff at Ochsner already enjoyed clinical appointments with Tulane's Department of Surgery, and Dr Raeburn Llewellyn, who had finished his residency at Ochsner in 1952, was appointed Chairman of the Section of Neurosurgery. Program alumni Charlie Wilson and Donald Richardson joined him. Dr Wilson subsequently transferred to the University of Kentucky before being appointed Neurosurgery Chairman at the University of California San Francisco (UCSF) in 1968. In 1971, LSU New Orleans began a training program under Dr David Kline and began sending residents to Ochsner as well as Charity. Dr Llewellyn stepped down in 1979, and Dr Richardson became chairman.

Dr Raeburn Llewellyn, native of Corbin, Kentucky, earned his undergraduate degree at the University of Alabama (UAB) and his medical degree at the University of Virginia (UVA). During his chairmanship, he converted the division into an independent department. Dr Llewellyn participated in the development of functional neurosurgery. He tried cerebellar pacemakers to treat intractable behavioral pathology,<sup>5-7</sup> used early deep brain stimulation (DBS) electrodes to treat seizures,<sup>8</sup> and described lobotomies for managing cancer pain.<sup>9</sup> He advocated heparin for prophylaxis<sup>10</sup> and was one of the first neurosurgeons interested in stroke (Figure 2).<sup>11-14</sup>

Donald Richardson, born in Vicksburg, Mississippi, quickly adopted New Orleans as his home, fully embracing the city's culture and music through his saxophone skills. He studied at Millsaps College before matriculating to Tulane Medical School. Dr Richardson was interested in functional and stereotactic neurosurgery and pain management. He developed an innovative comprehensive pain center in 1978. He published extensively about DBS and pain management even before DBS electrodes were commercially available.<sup>15-27</sup> He continues to practice part time (Figure 3).

## Role of the Ochsner Clinic in Neurosurgical Training From 1980 Until Hurricane Katrina

Dr Echols stepped down in 1972 and was succeeded by Dr Edward S. Connolly. Dr Connolly was born in Omaha, Nebraska, in 1934. After graduating from Stanford University and Creighton Medical School, where his father was a professor of Surgery, Dr Connolly finished his residency at UCSF under Drs. Edwin Bouldrey and Charles Wilson. He practiced in San Francisco until coming to Ochsner, where he remained faculty for 32 yr. Due to recognition of the unwieldiness of covering 4 institutions with only 5 residents, Tulane withdrew the residency program from Ochsner in 1993; subsequently, Ochsner became a primary site for the LSU New Orleans program (Figure 4).

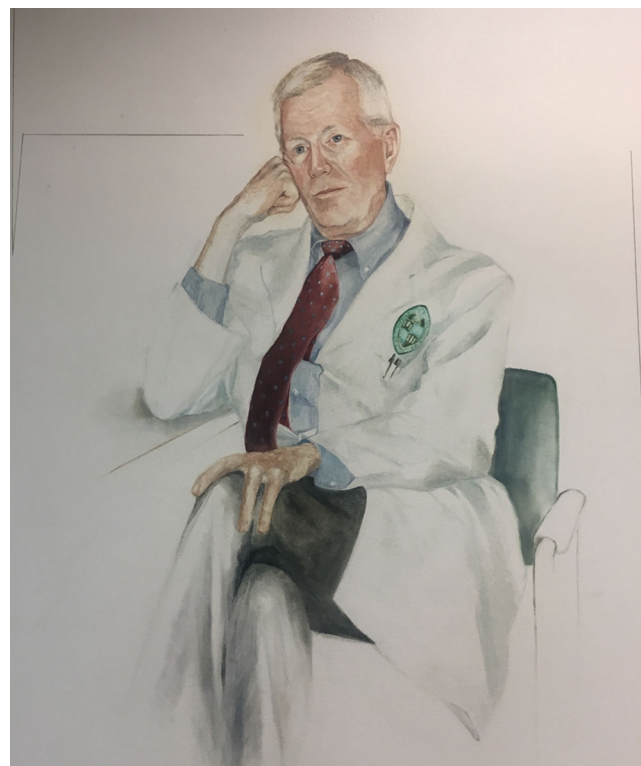


**FIGURE 2.** Dr Raeburn Llewellyn. Courtesy of the Tulane-Ochsner Neurosurgery Program.

## HURRICANE KATRINA AND THE REBIRTH OF THE TULANE UNIVERSITY/OCHSNER CLINIC FOUNDATION PARTNERSHIP FOR THE NEUROSURGERY PROGRAM

The floodwaters of Hurricane Katrina closed Charity and Tulane University Medical Center (TUMC) in 2005. Residents in the Tulane program were graciously accepted at different programs across the country while TUMC was rebuilt; meanwhile, Ochsner was largely spared and increased its volume. Tulane residents returned to New Orleans in 2006, but without Charity, the patient population was reduced. Dr Roger Smith, then Chairman at Ochsner, and Dr Miguel Melgar, Interim Chairman at Tulane, re-established a Tulane-Ochsner relationship, enabling Tulane residents to rotate at Ochsner. In 2008, the LSU program, with Dr Frank Culicchia (a Tulane graduate) as Chairman, restructured and withdrew residency training from Ochsner. Tulane and Ochsner again became partners in residency training.

Following years of negotiations post-Katrina, the new University Medical Center New Orleans (UMCNO) broke



**FIGURE 3.** Dr Donald Richardson. Courtesy of the Tulane-Ochsner Neurosurgery Program.

ground on April 18, 2011 to replace Charity. The facility, a 424-bed hospital, was built with storm-resistant technology designed to withstand hurricanes, tornadoes, and nuclear and biological accidents. It opened in the summer of 2015, and Tulane-Ochsner residents participate at UMCNO during their trauma surgery rotations.

With the support of leadership at both hospitals, the program's name was changed to the Tulane University/Ochsner Clinic Foundation Neurosurgery Program in 2009, with sponsorship remaining at Tulane. Dr Roger Smith continued as Chairman of the combined department, until 2013, when Dr Aaron Dumont was appointed Chairman of Tulane. Drs. Manish Singh, Ricky Medel, Chris Maulucci, and Peter Amenta joined the Tulane faculty. Drs. Roger Smith, Wale Sulaiman, CJ Bui, Erin Biro, Marcus Ware, James Kalyvas, Edison Valle, Daniel Denis, Sebastian Koga, Ilias Caralopolous, and Joseph Keen now form the Ochsner Neurosurgery Department.

## CURRENT PROGRAM LEADERSHIP AND INSTITUTIONS

Dr Aaron Dumont is the Charles Wilson Professor and Chairman of the Tulane University Department of



**FIGURE 4.** Dr Edward S. Connolly. Courtesy of the Tulane-Ochsner Neurosurgery Program.

Neurosurgery. Dr Dumont trained at UVA under Drs. John Jane and Mark Shaffrey. He joined the faculty at UVA before serving as Vice-Chairman and Director of the Division of Vascular-Endovascular Surgery at Thomas Jefferson. When appointed Tulane Chairman in 2013, he was the youngest chairman in the United States. Dr Dumont, who directs a National Institutes of Health-funded lab researching aneurysms, had focused in increasing the academic production at the Tulane-Ochsner Neurosurgery program<sup>28,29</sup> and was appointed Director of the newly created Tulane Center for Clinical Neurosciences in 2016, leading the clinical, education, and research efforts of the neuroscience program.

Tulane Medical Center has 496 beds across its campuses and is a tertiary care referral center with a comprehensive stroke center. The Tulane Department of Neurosurgery offers comprehensive neurosurgical, neuroscience, and neurocritical care services and functions as a hub for a 14-hospital network.

Dr Roger D. Smith was Chairman at Ochsner from 2006 to 2011, Chair of Tulane from 2009 to 2013, and Program Director

from 2009 to 2016. He completed his residency under Dr John Green at the Barrow Neurological Institute. He trained under Dr Gazi Yasargil in Zurich, becoming the first author of the Yasargil neurovascular textbooks. He joined LSU in July 1979 and subsequently served as Program Director until 2001, when he moved to Ochsner as Chairman. He has been president of the Louisiana Neurosurgical Society and the Louisiana Medical Society. He has special interests in open vascular neurosurgery, treatment of skull base tumors, and DBS, and has been elected several times as one of the best surgeons in Louisiana.

Dr Wale Sulaiman became Chairman of Ochsner in 2011. Originally from Nigeria, he completed his residency training at University of Manitoba in Canada, a spine fellowship at the Medical College of Wisconsin, and a peripheral nerve fellowship at LSU. He is the Neuroscience system's chair and the director for the Back and Spine Center and has special interests in minimally invasive spine surgery<sup>30-32</sup> and peripheral nerve surgery.<sup>33-36</sup> He directs the peripheral nerve research laboratory at Ochsner that focuses in nerve regeneration pathways.<sup>37</sup>

Dr Cuong "C.J." Bui became Chairman of the Ochsner Department of Neurosurgery in February of 2018 in addition to serving as Program Director. A graduate of LSU, he completed residency in Syracuse under Dr Charles J. Hodge and pediatric fellowship at UAB under Dr W. Jerry Oakes. He has special interests in hydrocephalus, Chiari malformations, pediatric brain tumors, adult and pediatric epilepsy, and spina bifida. He has established the only intrauterine myelomeningocele repair program in the Gulf South region. He is the current secretary and president-elect of the Louisiana Neurosurgical Society.

Currently, the Ochsner Health Care System is a nonprofit entity with over 30 hospitals and affiliates across the Louisiana region, more than 50 health centers, 1200 physicians, and about 17 000 employees, making it the largest employer in Louisiana. Ochsner Main Campus, a 650-bed hospital, is the primary site for the Department of Neurosurgery and the Neuroscience Institute. The Neuroscience Institute hosts the largest comprehensive stroke and neurovascular program in Louisiana, carries the largest neurocritical care unit in the state, and is qualified as Level IV Epilepsy Center. The department at Ochsner is currently ranked as the 24th best Neurology/Neurosurgery program by *U.S. News & World Report*<sup>38</sup> and has grown from 4 neurosurgeons to 11 since 2009 under the leadership of Drs Smith, Sulaiman, and Bui.

### Resident Training Structure and Philosophy

In the tradition of the "Echols" method, our overarching goal is to graduate residents that are superb clinicians and future academic leaders. We alternate between taking 1 and 2 residents a year. The beginning of the 7-year program is spent as an intern in neurosurgery, general surgery, otolaryngology, anesthesia, neurology, and critical care. Junior residency is divided between Tulane Hospital and Ochsner Main Campus. Fourth and fifth years are dedicated to research, electives, and/or enfolded

fellowships. The remaining years are spent as senior and chief resident at both institutions. Recently, our program has pursued Committee on Advanced Subspecialty Training accreditation for spine surgery, vascular neurosurgery, and neurocritical care fellowships.

### Global Neurosurgical Surgical Exposure

The chief resident and several attendings participate in annual education-exchange trips to Vietnam, including lecture sessions with our Vietnamese colleagues, hands-on clinics, and surgeries. As part of this initiative, the program works in partnership with UAB and AANS to sponsor Vietnamese neurosurgeons for educational time in the United States. Nigerian neurosurgeons also spend observation time at Ochsner. These programs expose our residents to a global perspective of neurosurgical care.

### The Current and Future Program

The future of the Tulane-Ochsner is inextricably linked with the evolution of New Orleans. The Crescent City has enjoyed robust recovery from Hurricane Katrina, garnering a number of accolades including “number one biggest brain magnet” (Forbes)<sup>39</sup> and “most improved metro” (Wall Street Journal),<sup>40</sup> and Orleans Parish is the third-fastest growing county in the United States.<sup>41</sup> Since the formal partnership between Tulane and the Ochsner Clinic Foundation, the program again realizes its founding mission, developing neurosurgeons that are leaders in the field. Residents have scheduled academic conferences in all neurosurgical subspecialties and graduate with an average of at least 1500 cases. The combined program performs more than 3500 surgeries per year.

With the death of Dr Wilson on February 24, 2018, the program has decided to create the Charles B. Wilson, MD Society comprised of the Tulane-Ochsner Residency Program alumni to promote academics and education in our program and networking.

Just as the City of New Orleans has recovered from Hurricane Katrina to be more innovative than ever, so too is the future of the Tulane-Ochsner Neurosurgery program exciting. We are proud of the obstacles that our program has overcome to regain the excellence that has characterized the program for generations.

### Disclosure

The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

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