OBITUARY

Charles B. Wilson, MD, 1929–2018

Mitchel S. Berger, MD, Ilona V. Garner, BS, and Michael W. McDermott, MD

Department of Neurological Surgery, University of California, San Francisco, California

CHARLES Byron Wilson was born August 31, 1929, in Neosho, Missouri, a small farming community near the Ozark Mountains. His parents were Margaret Francis Polson Wilson and Byron Sanders Wilson. His father owned the local drugstore and instilled a strong work ethic in Wilson from the time he was a boy. His maternal grandfather, Henry Polson, was of the Native American Cherokee tribe and this heritage remained an important part of Wilson's identity throughout his life.²

As a child, Wilson excelled at music, athletics, and academics. His natural talent and tremendous self-discipline and work ethic earned him both academic and football scholarships to Tulane University upon graduation from high school in 1947. As an undergraduate, he completed the pre-med curriculum and graduated summa cum laude in 1950. He then entered Tulane University School of Medicine (Fig. 1).²

Tulane

As in high school and college, Wilson excelled in medical school. As a senior, he won the Borden undergraduate research award and the medical book award for scholarship. He also won the Isadore Dyer Memorial Prize for the highest grade point average over 4 years, graduating first in his class from Tulane School of Medicine in 1954.²

Following graduation, he completed a 1-year internship on the Tulane Service at Charity Hospital, followed by a 1-year residency in pathology. During his pathology residency, he became skilled at conducting autopsies and worked with neuropathologist John Moossy. Over time, Wilson became especially interested in neuropathology and diseases of the brain, particularly gliomas.

In the spring of 1956, with his pathology residency coming to an end, Wilson decided to pursue neurosurgery, later explaining, "I was deeply interested in neuropathol-

FIG. 1. Charles B. Wilson, MD. Copyright UCSF Department of Neurological Surgery Archives. Published with permission.

ogy, the art of diagnosis, and the precision of surgery. Neurosurgery brought all my interests together, and it just felt right."²

He entered the Ochsner-Tulane neurological surgery residency program in 1956, training under Dean Echols at the Ochsner Clinic for 2 years and learning standard neurosurgical procedures for trauma, vascular and infectious disorders, and congenital and neuropathic pain syndromes. He also learned selective rhizotomy for trigeminal neuralgia, which was developed by Echols.

In 1958, Wilson became the first neurosurgical resident at the VA Medical Center of New Orleans, working under Raeburn Llewellyn and maintaining his interest in both pathology and gliomas. He personally analyzed the tissue of all of his tumor cases to confirm diagnosis after surgery. If the patient died, he removed the brain and brainstem and dissected them for microscopic analysis. "He became known both at the VA and later on at the neurosurgical service at Charity Hospital as the 'neuropathologist with operative privileges.'"²

At the end of his neurosurgical residency, he returned to Charity Hospital as chief resident. During this time, most brain tumors were still treated very conservatively, typically only with a biopsy to confirm the diagnosis, but there were some experiments being done using nitrogen mustard gas as a chemotherapeutic agent. Wilson hypothesized that intraarterial infusion of nitrogen mustard chemotherapy could help avoid the systemic side effects of venous administration, and he began testing this in his patients with malignant brain tumors. The regimen was better tolerated but wasn't effective against the tumor. This was Wilson's first experience with chemotherapy, which would later become a major focus in his search for a cure for malignant gliomas.

Louisiana State University

After graduating from neurosurgical residency in 1960, Wilson accepted a position as a faculty instructor at Tulane Medical School, but he soon left to join the faculty at Louisiana State University (LSU). It was at LSU that he developed his first laboratory experiments, learning to culture tissue *in vitro* and implanting tumors into rodents. With these methods, he devised the first animal model for testing intraarterial chemotherapy against brain tumors.^{10,13} In the spring of 1963, he received the Best Teacher Award from the LSU medical students. Shortly after, he took his board exams in neurosurgery and passed with the highest score ever recorded.²

University of Kentucky

Later in 1963, he was recruited by the chair of surgery, Benjamin Eiseman, to the University of Kentucky to become the first chair of a new division of neurosurgery. It was here that he met researcher Marvin Barker, who would become a lifelong friend and colleague. He and Barker began to develop a variety of cell and animal models for neurological conditions, including meningioma cell cultures and hydrocephalus and spinal cord compression models in dogs. In 1964, he and Barker applied for and received one of the first NIH grants for brain tumor research.

While at the University of Kentucky, Wilson organized one of the first-ever national conferences devoted to brain tumors: The Kentucky Conference on Brain Tumor Che-

FIG. 2. Charles B. Wilson, MD, prepares for surgery at UCSF Medical Center. Photograph by Paul Fusco. Copyright UCSF Archives & Special Collections. Published with permission.

motherapy.⁴ This highly significant event was the first to foster cooperation among academic neurosurgeons, scientists, and the NIH on the treatment of brain tumors. It was also a precursor to the International Conference on Brain Tumor Therapy and Research, which continues today.

University of California, San Francisco

Wilson was recruited to the University of California, San Francisco (UCSF), as chair of the Division of Neurosurgery in 1968, at just 39 years of age. His appointment put him in prestigious company; previous chairs included the illustrious neurosurgeons and educators Howard Naffziger, John Adams, and Edwin Boldrey. But over the next 28 years, Wilson would turn the already well-regarded division into one of the nation's most sought-after academic neurosurgery training programs and an internationally recognized center for research and treatment of brain tumors (Fig. 2).

Brain Tumor Research Center

When Wilson arrived in 1968, he became director of the Howard C. Naffziger Laboratories for Neurosurgical Research and expanded them to include basic scientists from a variety of fields, including experimental therapeutics; cell biology, kinetics, and culture; radiation biology; and pharmacology. Among these were Takao Hoshino, an internationally recognized scientist famous for his work with cell cultures of human brain tumors, and Wilson's research partner in Kentucky, Marvin Barker.

In parallel, he established the Clinical Chemotherapy Service, which was the clinical research counterpart to the basic science labs. He also recruited clinical investigators from a variety of disciplines, including neurosurgery, neurology, oncology, radiology, radiation oncology, pharmaceutical chemistry, and many others. In doing this, the Naffziger Labs and the Clinical Chemotherapy Service became the first concentrated scientific effort devoted exclusively to CNS tumors and one of the first examples of translational research in the United States.

In 1970, Wilson sought support from the NCI, writing

a letter to the Clinical Investigations Branch outlining the evolution of a Brain Tumor Research Center (BTRC) at UCSF, which included integrated programs devoted to chemotherapy, research, and training. His proposal described 15 projects, including immunological and DNA studies.⁵

The NIH approved a cancer center research grant to UCSF on June 1, 1972, to fund Wilson's vision. The inaugural ceremonies for the BTRC took place on January 17, 1973. The BTRC was the first such center approved by the NCI and the cancer center research grant was the only federal support for any program that integrated clinical research programs, which opened the door for similar programs for brain tumors to be funded at other centers.

In 1972, Wilson recruited Victor Levin, who had previously trained at the NIH and Massachusetts General Hospital, to work on the pharmacokinetics of cancer drugs. Levin would go on to become the chief of the Chemotherapy Service, which later become known as the Neuro-Oncology Service.⁵ In creating a dedicated term ("neuro-oncology") for the practice of treating patients with brain tumors, Wilson and Levin essentially established an entire subspecialty of oncology.

The laboratory and clinical investigations made during the first few years of the BTRC influenced the direction of brain tumor chemotherapy in the US. The BTRC investigators published the initial reports showing the efficacies of carmustine and procarbazine as single agents,^{3,9,11} and then in 1975 they published the first report showing the multidrug PCV protocol was an effective treatment against malignant brain tumors.⁷ In 1979, the BTRC was awarded its first NIH Program Project Grant, which has been renewed in every cycle since that time and continues to be funded in the UCSF Department of Neurological Surgery today. In 1978, Wilson established the BTRC Tissue Bank, and today it is one of the largest repositories of human brain tumor samples in the world. Over the next 3 decades, the basic science investigators and clinical trials specialists at the BTRC continued to make tremendous contributions to the field of brain tumor care and research, contributing over 1500 publications to the literature.⁵

A Master Technician

In addition to his contributions to the field of brain tumor research, Wilson was widely regarded to be a technically superb neurosurgeon. So much so that his "physical genius"—a combination of innate skill and an intense schedule of practice and preparation—was documented in a *New Yorker* article by writer Malcolm Gladwell.⁶

In the operating room, he was known to be fast and aggressive, with no wasted motion and a distinct, recognizable style. At the apex of his career, his reputation had grown internationally, and he was referred approximately 750 cases per year and would perform 8 surgeries in a single day.^{2,6}

The procedure perhaps most associated with Wilson is the transsphenoidal approach to pituitary tumors. Prior to Wilson's arrival at UCSF, John Adams had treated several of these tumors with craniopharyngectomy, but results were not good and approximately 25% of patients had per-

sistent growth hormone secretion.¹ Not satisfied with these outcomes, Wilson learned to perform microscopic transsphenoidal surgery for pituitary tumors, which was being used at a few centers around the country.

The success rate was much higher than with irradiation or hypophysectomy, and this led him to continue perfecting this operation.¹² UCSF soon became a major referral center for all over northern California for pituitary cases. By the time he retired in 2002, he had done over 3300 of these operations. Wilson's protégée in pituitary surgery, Sandeep Kunwar, MD, continued his legacy and developed the extended endonasal approach to pituitary tumors.^{2,8}

Although brain and pituitary tumors were his particular interest, his practice extended to a variety of subspecialties including cerebrovascular surgery, spinal surgery, and the surgical treatment of trigeminal neuralgia with microvascular decompression.

Selected Honors

In 1985, Wilson became the first Tong-Po Kan Chair of Neurological Surgery, which was endowed by UCSF faculty member Yuet Wai Kan, MD, in memory of his father. Among Wilson's many other achievements, which are too numerous to list here, he served on the board of the American Association of Neurological Surgeons (AANS) from 1990 to 1994 and as its vice president in 1994; he received an honorary doctorate from Tulane in 1996 for his lifetime of work; and in 2008 he received the Cushing Medal from the AANS and a Lifetime Achievement Award from the Society of Neuro-Oncology. In 2000, Tulane University established the Charles B. Wilson Professor of Neurosurgery to honor him, and it is currently held by Tulane's Chair of Neurosurgery, Aaron Dumont, MD.

A Legacy of Training Academic Neurosurgeons

From the beginning of his time as chair, Wilson sought to train the next generation of leaders in academic neurosurgery. In 1968 there were 50 applicants to the neurosurgery residency program, and by 1994 the program attracted 100 applicants. During those 26 years, 41 residents were trained and 44% continued in academic neurosurgery (L. H. Pitts, personal communication, 2018).⁸ Fourteen of Wilson's residents went on to serve as chairs of neurosurgery programs themselves (Mitchel Berger, Philip Gutin, Stephen Powers, Mark Rosenblum, Robert Spetzler, James Boggan, Robert Levy, Philip Weinstein, Griffith Harsh, Neil Martin, Nicholas Barbaro, Jonathan Hodes, Joshua Bederson, and Dong Kim). Many others have gone on to achieve senior leadership positions in academic neurosurgery throughout the nation. In this way, Wilson himself has dramatically influenced the direction of the field today.

Professor Emeritus

In 1994, Wilson retired as chair and became director of tertiary care services at UCSF. He obtained a master's degree in health science administration and then became

senior associate of medical affairs to the president of the University of California in 1996. That same year he stepped down as director of the BTRC.²

After speaking at a panel put on by the Institute for the Future in 1997, he was invited to become a senior fellow there. In 1998, he co-founded the Global AIDS Interfaith Alliance, which focused on preventing maternal-to-fetus transmission of the HIV virus in Malawi. It then expanded to provide a variety of programs throughout Africa, especially in regions most affected by HIV/AIDS, tuberculosis, and malaria. He was also involved with setting policy and fundraising for Clinic by the Bay, which provides free medical services to uninsured people in the Bay Area.

Wilson became Professor Emeritus of Neurological Surgery on January 2, 2002, and continued to pursue his interests in issues regarding academic medical centers, emerging health technologies, the health care workforce, and the impact of genomic medicine. Until his death, he retained close personal ties with his former UCSF colleagues and many of his trainees, all of whom felt extremely privileged to have known him.

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References

1. Adams JE, Seymour RJ, Earll JM, Tuck M, Sparks LL, Forsham PH: Transsphenoidal cryohypophysectomy in acromegaly. Clinical and endocrinological evaluation. **J Neurosurg** **28**:100–104, 1968
2. Andrews BT: **Cherokee Neurosurgeon. A Biography of Charles Byron Wilson, M.D.** San Francisco: Brian T. Andrews, M.D., 2011
3. Barker M, Hoshino T, Gurcay O, Wilson CB, Nielsen SL, Downie R, et al: Development of an animal brain tumor model and its response to therapy with 1,3-bis(2-chloroethyl)-1-nitrosourea. **Cancer Res** **33**:976–986, 1973
4. Bering EA Jr, Wilson CB, Norrell HA Jr: The Kentucky Conference on Brain Tumor Chemotherapy. **J Neurosurg** **27**:1–10, 1967
5. Eastwood S: **Brain Tumor Research Center 30th Anniversary.** San Francisco: UCSF Department of Neurological Surgery, 2002
6. Gladwell M: The physical genius. **New Yorker**. April 2, 1999 (<https://www.newyorker.com/magazine/1999/08/02/the-physical-genius>) [Accessed May 17, 2018]
7. Gutin PH, Wilson CB, Kumar AR, Boldrey EB, Levin V, Powell M, et al: Phase II study of procarbazine, CCNU, and vincristine combination chemotherapy in the treatment of malignant brain tumors. **Cancer** **35**:1398–1404, 1975
8. Rosegay H: A history of neurological surgery at the University of California, San Francisco. **Neurosurgery** **38**:794–805, 1996
9. Vasantha Kumar AR, Renaudin J, Wilson CB, Boldrey EB, Enot KJ, Levin VA: Procarbazine hydrochloride in the treatment of brain tumors. Phase 2 study. **J Neurosurg** **40**:365–371, 1974
10. Wilson CB: Chemotherapy of brain tumors by continuous arterial infusion. **Surg Forum** **13**:423–425, 1962
11. Wilson CB, Gutin P, Boldrey EB, Crafts D, Levin VA, Enot KJ: Single-agent chemotherapy of brain tumors. A five-year review. **Arch Neurol** **33**:739–744, 1976
12. Wilson CB, Rand RW, Grollmus JM, Heuser G, Levin S, Goldfield E, et al: Surgical experience with a microscopic transsphenoidal approach to pituitary tumors and non-neoplastic parasellar conditions. **Calif Med** **117**:1–9, 1972
13. Wilson CB, Weilbaecher R, McGarry P: Characteristics of human brain tumors in tissue cultures and animal host. **Surg Forum** **14**:430–431, 1963

Disclosures

The authors report no conflict of interest.