IN MEMORIAM

Juhn A. Wada, MD (1924–2023)

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Juhn A. Wada, MD

Juhn Atsushi Wada was a creative scientist-physician who altered the trajectory of understanding brain-behavior relationships through his innovative intracarotid application of amobarbital to produce a reversible lesion, aptly named the Wada test.

Dr. Wada graduated from Hokkaido Imperial University in 1946. As a young physician, he was placed in charge of a neurology service, but because neurosurgery was not yet available in postwar Japan, Dr. Wada taught himself brain surgery by reading texts provided by his older brother, Juro, a surgeon training in the United States, and eventually performed hundreds of craniotomies. Witnessing the devastating effects of postoperative aphasia, Dr. Wada used local anesthesia during surgery and verbally engaged patients during the operation to minimize resection of functional language areas.

In addition to his clinical duties, Wada conducted animal research on basic mechanisms of epilepsy. An early animal experiment studied the effects of amobarbital. When Dr. Wada encountered a patient with prolonged focal motor status epilepticus refractory to available anticonvulsants, he obtained family consent and was able to terminate the status with left intracarotid amobarbital injection. Until the patient's hemiplegic and speech arrest resolved, he was worried that amobarbital administration had caused a stroke.

Intracarotid amobarbital administration was developed to reduce the cognitive side effects of electroconvulsive therapy (ECT) by anesthetizing the language dominate hemisphere during ECT. To gain full knowledge of carotid amobarbital effects before combining it with ECT, Wada tested effects of amobarbital to the left and right brain in 15 patients with psychiatric disorders.[1,2] This first report of the language and behavioral effects of intracarotid amobarbital administration was published in Japanese in 1949[3] but was not translated to English for almost 50 years.[1]

Penfield and colleagues at the Montreal Neurological Institute (MNI) were pioneers in expanding epilepsy surgery techniques including intraoperative stimulation to map language functions. In 1954, Wada visited the MNI on a Rockefeller scholarship and introduced them to intracarotid amobarbital testing, allowing the procedure to establish cerebral language lateralization preoperatively. This led to the application of the Wada test to preoperatively assess language in epilepsy surgery patients at MNI and other centers.[4] Multiple reports of amnesia after unilateral temporal lobectomy were hypothesized to be due to contralateral temporal lobe damage.[5] Dr. Brenda Milner modified the Wada test to assess risk of postoperative amnesia using the Wada reversible lesion design to mimic the effects of surgical resection on memory.[6]

Dr. Wada published 323 peer-reviewed articles and edited 11 medical books. He helped establish the epilepsy program at the University of British Columbia. He was the founding President of the Canadian League Against Epilepsy, President of the American Clinical Neurophysiology Society, President of the American Epilepsy Society, and received the CLAE Wilder Penfield Gold Medal Award, American Epilepsy Society Founders Award, Herbert Jasper Award, William G. Lennox Award, and Lifetime Achievement Award from the International League Against Epilepsy and International Bureau for Epilepsy. Dr. Wada was named an Officer of the Order of Canada and received the Order of the Sacred Treasure from the Emperor and Empress of Japan and the Queen Elizabeth II Golden Jubilee Medal and Diamond Jubilee Medal. Despite all of the honors, Dr. Wada was always very humble.

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We first met Dr. Wada in 1986 when he visited the Medical College of Georgia. Dr. Wada discussed why he studied epilepsy, presenting slides filled with images of paintings, architecture, theater, and dance, explaining that he was fascinated by the arts as expressions of the human brain. Similarly, Dr. Wada described how disorders of the brain including epilepsy were also expressions of the human brain (although in a pathologic sense) that provided insights into brain mechanisms in the search to improve the human condition. A few years before this lecture, Dr. Wada had visited southern France and became inspired to become a painter. His quests for learning, exploring, and creating were lifelong. At age 90 years, he found great joy in learning to play the piano.

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