Jacob Valk, MD, PhD

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This memorial aims to honor Professor Jaap Valk, who passed away on April 13, 2024, at 94 years of age, for his many clinical, educational, and scientific accomplishments.

Jaap was born in Rotterdam, the Netherlands, on July 23, 1929. He obtained his medical degree at Leiden University, followed by a residency in neurology and psychiatry. He practiced neurology and psychiatry for several years but decided to become a neuroradiologist and did his training with the famous Professor Bernard George Ziedses des Plantes, who invented planigraphy and radiographic subtraction. Jaap completed his thesis on brain atrophy in schizophrenia in 1971, with Ziedses des Plantes as supervisor. After his training in radiology and neuroradiology, Jaap became Head of the Department of Neuroradiology of VU University Medical Center as well as the Valerius Clinic, a psychiatric hospital in Amsterdam. In 1979, he was appointed full Professor of Neuroradiology at VU University. In 1981 he became the Head of Radiology of VU University Medical Center. He retired from his academic job in 1999 but continued to work in private practice.

Jaap loved to be at the forefront of new developments. He excelled in pneumoencephalography, myelography, angiography, intervention, and CT. His landmark articles on lateral cervical puncture, described in 1977 and re-evaluated in 1982 with more than 1000 cases, were required reading for radiology trainees. When the amazing, novel technique MR imaging entered medicine, he dived into it and wrote a book on the basic principles of MR imaging, together with Professor Cor MacLean and Dr Paul Algra (Elsevier, 1985). He got his first MR imaging machine in 1985, a 0.6 Technicare (Ridderkerk, The Netherlands). He had a keen interest in pediatric neuroradiology, and many children from the Netherlands came to Amsterdam for MR imaging, providing Jaap with a wealth of cases for studies, papers, courses, and international lectures.

Jaap had a true scientific mind. He taught his residents and PhD students that when coming to a conclusion, they always needed to be open to doubt and alternative interpretations. Nothing was set in stone for him. He was very interested in fields outside radiology and neurology, including physics, biochemistry, toxicology, embryology, pathology, immunology, molecular biology, and statistics. A review of his myriad publications confirmed his interest in these fields and his ability to encourage trainees in their academic pursuits. He supervised trainees not just in neurology and neuroradiology, but also in pathology, otolaryngology, orthopedics, and cardiology, inspiring them to explore new techniques, such as MR arteriography and blood flow to organ systems outside the brain and spine. He was highly regarded by both clinicians and basic scientists, always curious about the latest technical developments, suggesting improvements for more meaningful applications in patient populations.

Jaap was extremely productive. He favored writing books and authored and co-authored many, among which were *Computed Tomography of Cerebral Infarctions* (1981), *Basic Principles of Nuclear Magnetic Resonance Imaging* (1985), *Magnetic Resonance of Head, Neck and Spine* (1987), *Magnetic Resonance of Myelination and Myelin Disorders* (1989, 1995, and 2005), and *Magnetic Resonance of Dementia* (2002). He also co-authored many articles, more than 300 on PubMed. He gave numerous invited lectures at international meetings, which were impressive and overwhelming. He received many awards, including the Wertheim Salomonson Medal of the Dutch Society of Radiology (1996), the Gold Medal of the International Society of Magnetic Resonance in Medicine (1999), the Cornelia de Lange award of the Dutch Society of Child Neurology (2007), and the Gold Medal of the American Society of Pediatric Neuroradiology (2011). He became an honorary member of numerous international medical societies, including the Radiological Society of North America (2003) and the European Society of Neuroradiology (2018).

Jaap Valk was an inspiration to many. His relentless energy, his curiosity, his analytic thinking, and his unwavering interest to explore, study, and understand the fascinating complexity of the

Professor Jaap Valk was a wonderful clinical radiologist and physician who was able to connect to children with ease, instantaneously gaining their trust and sympathy.

human brain were unparalleled. One of his favorite phrases was "no matter, no mind," referencing the many inborn errors of metabolism and neurodegenerative disorders he studied during his long and illustrious career. During his entire life, he was a visionary. Jaap Valk recognized technologies early in his career and knew how to use them to advance science. He was one of the first to use CT and later MR imaging to study the CNS. The concept of pattern recognition of white matter disorders propelled the correct classification, recognition, and discovery of many neurodegenerative disorders. Together with Marjo van der Knaap, a child neurologist, he published the landmark article titled "Pattern Recognition in MR Imaging of White Matter Disorders in Children and Young Adults" in 1991.[1] It mentions the following: "The pattern recognition program was written so that when fed data about MR imaging abnormalities observed in a new case, the computer produces a differential diagnosis with probabilities and 95% confidence intervals for each differential diagnosis. The database is open-ended. It is hoped that the addition of new cases will result in more complete insight into the variability of patterns observed in disease categories and subcategories, and it will make the computer diagnosis more specific and reliable."

These conclusions were visionary and groundbreaking 33 years ago and could even today be the key message of any scientific article on artificial intelligence, machine learning, and deep learning, which is even more impressive. Jaap Valk was always far ahead of his time. MR imaging pattern recognition for white matter disorders turned out to be a magnificent diagnostic tool, which is still central for white matter disorders today. At its introduction, approximately two-thirds of the patients with a suspected genetic white matter disorder, a so-called leukodystrophy, did not receive a specific diagnosis. MR imaging pattern recognition of these unsolved cases led to the identification and definition of a series of novel leukodystrophies. The subsequent identification of related gene mutations proved that these novel disorders were real disease entities. One could say that MR imaging pattern recognition revolutionized the field of leukodystrophies. Throughout his life, Jaap kept a keen interest in leukodystrophies and supported the research when he could. Other subjects Jaap worked on included MR imaging of developmental anomalies of the spinal cord, multiple sclerosis, and dementia.

Jaap Valk was, of course, more than "just" a physician, educator, mentor, and scientist. He was a true renaissance man who enjoyed the company of people, traveled around the world, and made friends on at least 6 of the 7 continents. Knowing Jaap Valk, it may very well be that he also visited Antarctica, the seventh continent. Jaap Valk was generous, warm, welcoming, and interested in all aspects of culture and art. He showed a true interest in every person he met and made one feel special. He truly enjoyed being questioned by trainees at conferences and had the delightful habit of showing up at their presentations to be an encouraging presence. Jaap welcomed visits to his reading room by those same trainees, proud to highlight the accomplishments of his team. He loved to mentor people; he shared his wisdom, gave advice, and shaped and supported the careers of many of us.

Jaap Valk was a gifted pianist. During scientific meetings, whenever he could find a piano, he would sit down and play a happy tune for everybody to enjoy. He also wrote several plays. One of his recommendations was to try to write at least 1 book per year. Another piece of advice was that if you do not know anything about the subject, it helps to write a book about it.

A giant in medicine, a superb scientist, a great mentor, a world traveler, and a friend to so many has left us, but his legacy will endure and we are grateful for all he gave us.

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