

In Memoriam: Albert Leon Waldo, MD, 25 November 1936 to 17 August 2023

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Pioneer and Master Teacher of modern clinical electrophysiology

Professor Albert Waldo passed away on 17 August 2023, in Key Largo, Florida, USA. He was born in the Bronx in New York City (NYC) and went to school in the NYC school system. He received a scholarship to Cornell University for his undergraduate studies and obtained his medical degree from the State University of New York, Downstate Medical School in 1962. His postgraduate training included residency at John Hopkins Medical Center in Baltimore, MD, and Kings County Medical Center in NYC. In 1966, he undertook a cardiac electrophysiology fellowship with Professor Brian Hoffman that imbued him with a lifelong interest in research in cardiac electrophysiology. He joined a stellar and collegial cast of researchers in this department that included Michael Rosen, Robert Myerburg, Harold Strauss Thomas Bigger, Henry Gelband, and Arthur Bassett. In that period, he encountered Professor David Scherf, the former Head of Cardiology at the University of Vienna, who had come to New York after escaping the Nazi terror and subsequently joined the faculty of New York Medical College, Valhalla, NY. Waldo discussed with him the findings of his work on atrial pacing from different sites and the resulting P-wave morphology as well as rapid atrial pacing. Scherf encouraged him to pursue this line of investigation, and this culminated in the discovery of the phenomenon of 'entrainment of re-entrant tachycardias'.

In 1971, Dr Waldo assumed the position of Associate Professor of Medicine and Director of Electrophysiology at the University of Alabama at Birmingham. The Chief of Cardiology at this time was Dr Thomas James, and the Chief of Cardiac Surgery was Dr John Kirklin.

Dr Waldo started a close co-operation with Dr Kirklin and his colleagues, Drs Kouchoukos and Karp. Using simple technology, he pioneered the utilization of atrial pacing techniques in patients with post-operative atrial flutter or atrial fibrillation using epicardial electrodes. In 1977, he published his landmark paper on 'Entrainment and interruption of atrial flutter with atrial pacing: studies in man following open heart surgery' in *Circulation* (1). This initiated a lifelong investigation into the properties and application of entrainment in numerous tachycardias and became a fundamental part of the investigation and diagnosis of many tachycardias. Together with the cardiac surgeons, he started surgery for ventricular tachycardia and designed sophisticated intra-operative mapping techniques—at the same time as the Philadelphia group (Mark Josephson and Alden Harken) and the group at Duke University (Drs Will Sealy and John Gallagher). He also collaborated with the French group of Drs Guy Fontaine and Gerard Guiraudon at Lariboisière Hospital in Paris. However, his important contributions to clinical electrophysiology extended far beyond this. They included complexities of atrial activation manifest in varying P-wave morphologies, identification of low amplitude 'fractionated' potentials in the ischaemic myocardium, classification of various forms of atrial flutter, pause dependence of the torsades de pointes, the concept of entrainment of many re-entry tachycardias, and designing and contributing to important clinical trials.

In 1986, Dr Waldo moved to Case Western Reserve University in Cleveland, OH, as Head of the Electrophysiology section. He was granted an endowed chair, the Walter Pritchard Professor of Cardiology and Professor of Biomedical Engineering, where he continued his many contributions to our field. Dr Waldo has a long train of students and fellows who became leaders in the field in the USA, Europe, and Japan including Drs Vance Plumb, Helmut Klein, Mark Carlson, Andrew Epstein, Richard Henthorn, Michael Hilo, Brian Olshansky George Van Hare, and J. Christoph Geller.

He published over 500 scientific articles and numerous books. A master teacher, he was acclaimed worldwide for his commitment to education and training in the field. He was the first electrophysiologist elected to be the President of the North American Society of Electrophysiology in 1984.

Despite his eminence, Albert Waldo was a humble, self-effacing, and endearing person. He had particular aphorisms that defined the man. Among them:

I come from a family that says SPS—self-praise stinks

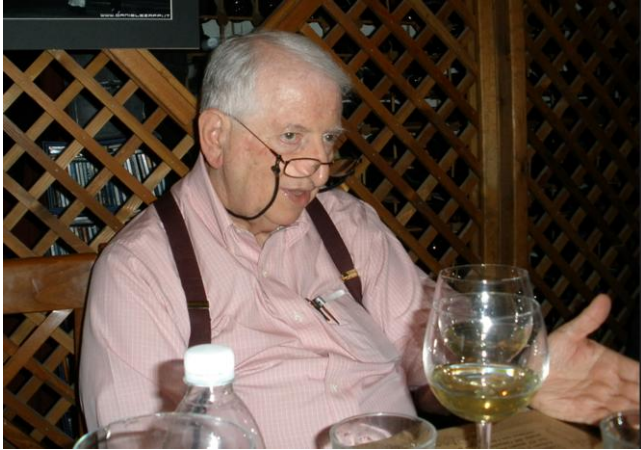
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His warm and welcoming personality was loved and appreciated by students, trainees colleagues, and his patients. He enjoyed a quiet sense of humour, relating anecdotes and often quoting American comics such as Henny Youngman. Growing up two blocks from Yankee Stadium, he was an avid baseball fan and often quoted the great Yankee Yogi Berra, e.g. 'You can observe a lot just by watching' in pointing out that the first axiom of medical practice is to do no harm.

Dr Waldo had a great humanitarian spirit, loved travelling all over the world, and had an astonishing knowledge of history. He particularly enjoyed the company of friends and guests.



Professor Waldo in a quintessential unguarded moment with his colleagues

He is survived by his wife, Rosin, their three children, and five grandchildren. He will be remembered by all of us as an extraordinary human being, a great teacher, and a wonderful physician to whom the field of modern medicine owes a great debt of gratitude and respect.¹

Reference

1. Waldo AL, Maclean AW, Karp RB, Kouchoukous NT, James TN. Entrainment and interruption of atrial flutter with atrial pacing: studies in man following open heart surgery. *Circ* 1977;**56**:737–45.