

## Pioneering the Pacemaker in Michigan

RICHARD JUDGE LOOKS BACK

In the summer of 1960, I was a new assistant professor of internal medicine attending on Two West in Old Main, not without some trepidation, I might add. I was only four years out of residency and the junior member at the Heart Station. On August 11, I was summoned to the bedside of a 30-year-old, semi-comatose woman who had been admitted for treatment of complete heart block and was having Stokes-Adams attacks — loss of consciousness resulting from a sudden reduction in blood flow from the heart to the brain.



Richard Judge

The patient was attached to a Zoll Defibrillator with an external pacemaker designed for emergency use. This consisted of a big gray box plugged into the wall next to her bed and two wires attached to electrodes strapped to her

chest. Each discharge from the defibrillator lifted her back off the bed, causing a soft groan. While taking her pulse (there were no electronic monitors in 1960), I gradually lowered the output. Abruptly her pulse disappeared and she began to seize. I increased the output, then tried again; strike two. Tried again; strike three. It was a Catch-22: Turn off the pacemaker and she was dead; continue pacing, and cause agony. Oh, how I wished we had an implantable pacemaker.

It became clear to me that follow-up was going to be crucial with pacemaker patients in the future. This experience also convinced me that I wanted to play a role in future pacemaker development.

I was aware from occasional visits to the operating room that the Thoracic Service possessed a first-generation external pacemaker for clinical trial from the Medtronic Instrument Company. The chief of service, Herb Sloan, had forbidden its use because we had no back-up permanent pacemakers. However, after we explained the patient's dire condition, Herb said we could use it. Accompanied by Delbert Bobblit from Radiology and Jim McKenzie from Thoracic Surgery, I took the patient to our primitive cath lab. Her rhythmic



Medtronic Pacemaker used to pace the heart of a female patient from August 1960 to April 1961. From the U-M Center for the History of Medicine Collection, gift from Richard Judge. Photo: Martin Vioet

twitching made things technically difficult, but Jim was able to isolate the cephalic vein and I took over. With Del handling the fluoroscope, I advanced the catheter into the right ventricle. I hooked

up the generator, set the rate at 70, and turned it on. Then I turned off the Zoll pacemaker. Her rate continued at 70. An ECG showed good ventricular capture. I doubt that any of us felt that she could continue to pace very long, but at least she was off the emergency pacemaker and very much alive.

By August 17, the patient had recovered, been placed on oral anticoagulants to prevent venous thrombosis and prophylactic antibiotics to prevent sepsis, and was ready for discharge. Her pacemaker

was suspended by a ribbon around her neck and was pacing her heart just fine. Jim McKenzie and I saw her jointly over the next eight months, and each time she was pacing well. It was hard to believe. In fact, it was like a miracle.

There were unique problems along the way, of course. We had to supply batteries and show the family, which luckily was immensely supportive and loving, how to replace them and adjust the two controls. We taught them how to take the radial pulse. It became clear to me that follow-up was going to be crucial with pacemaker patients in the future. This experience also convinced me that I wanted to play a role in future pacemaker development.

When the patient was dying on April 11, 1961, from a cerebral hemorrhage, her heart was still pacing at 70. Years later, after we had implanted over a thousand pacemakers at the University of Michigan, I gave a luncheon to honor those dozen or so patients who had survived more than 20 years. I gave each a little gold heart pin and told them that they were heroes.

Among them was a woman who, by the time of my retirement, had paced continuously for 42 years. "Well," she told me, "we didn't have very many alternatives, did we?" Perhaps they didn't, but nevertheless, I will always feel that those early, uncomplaining pacemaker patients were as heroic as they come. [m](#)

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## Hewlett and Wilson: Michigan's First Big Names in Cardiology

For more than a century, the University of Michigan has played a prominent role in the field of cardiology, a role that owes much to two physicians who, in the 1900s, made significant strides in helping the medical community better understand the cardiovascular system.

Cardiologist Albion Walter Hewlett joined the U-M Medical School in 1908 after Cooper Medical College, where he held a faculty position, was damaged in the San Francisco earthquake. In addition to Hewlett's pioneering work measuring blood flow, analyzing cardiac arrhythmias, and determining the effects of certain chemicals, such as amyl nitrite, upon blood vessels, he also advocated for laboratory tests to supplement clinical evaluation. But one of Hewlett's most valuable contributions to cardiology at Michigan was raising the funds needed to purchase an electrocardiograph in 1914, first introduced in the United States in 1909.

Hewlett had stated prophetically in a 1909 article in *Physician and Surgeon* that "it is not probable that the electrocardiogram will ultimately permit of an early diagnosis of disease of the heart muscle." Another of his valuable contributions was giving free reign to his assistant, Frank Norman Wilson, to get the machine working. Wilson accomplished that when he recorded the electrocardiogram of a 72-year-old farmer in March of 1914.

Wilson's research at Michigan over the next 32 years made him the world's leading electrocardiographer. Hewlett returned to California in 1916 to accept a faculty position at Stanford. His son William established the family name in computer technology by co-founding the Hewlett Packard Company.



Bookplate of Frank Norman Wilson reflecting his achievements with illustrations from his scientific publications. From *Not Just Any Medical School* by Horace Davenport. © 1999 The University of Michigan Press.

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