

John Canty Jr

A Full Life, Both at Home and in the Lab

Jaelyn M. Jansen

Among scientists and doctors, John Canty Jr, MD, might be best known for his successes in translational cardiology research. But outside the laboratory, in his lifelong hometown of Buffalo, NY, he is more likely to be recognized as the father of any one of his 6 children or the grandfather of 9. In a career where many struggle to balance professional and personal life, Canty has managed to find success in both.

As Chief of the Division of Cardiovascular Medicine at the State University of New York at Buffalo, Canty works to bring research from the laboratory bench to the patient's bedside. His work at the translational interface is broadly focused on understanding and treating ischemic heart disease. In fact, his clinical research has helped develop advanced imaging techniques that may prove to be helpful in identifying areas of the heart that experience inadequate blood flow.^{1,2}

Canty's basic research has defined how the heart adapts to inadequate blood flow. He found that the heart senses decreased oxygen and induces changes at the cellular level to downregulate its function and metabolism. This research demonstrated how the heart is able to protect itself from irreversible damage, providing insight into the molecular basis of a phenomenon known as hibernating myocardium, which was discovered decades ago.^{3,4}

At first, these adaptations to low blood flow seemed entirely beneficial, but Canty came to realize that they could also have dire consequences. Using animal models of hibernating myocardium, Canty found that the regional adaptations could render the heart vulnerable to spontaneous and lethal ventricular arrhythmias.^{5,6} The work may help to explain why patients with chronic coronary artery disease may die suddenly as their first and only manifestation of heart disease.

In a recent conversation with *Circulation Research*, Canty described how he has balanced life as a successful cardiologist and devoted father while living in a small city in upstate New York.

What Was Your Family Like Growing Up?

I was born and raised in Buffalo, NY, and it's where I've lived almost all of my life. My mom was a teacher, but she stayed home to raise me and my younger brother and sister. When we were grown, she went back to teaching kindergarten.

My father was an engineer. Early on, he worked for Union Carbide, but he later became a consulting engineer, designing hyperbaric diving chambers. When I was in high school, he was working with the University at Buffalo on their diving chamber. He brought me along on trips to visit the physiology department, and I'd listen to him talk with world-renowned respiratory physiologists like Leon Farhi and Herman Rahn

It was probably a very impressionable time for me. Biomedical research seemed like a neat thing—to be able to combine human physiology and basic science. This experience also made me realize that it was possible to do both research and clinical care and combine engineering with medicine.

How Did You Become Interested in Cardiology?

Because my dad was an engineer, I was interested in engineering from a young age. But in sixth grade, I did a project for school, and it was then that I knew I wanted to be a cardiologist. I drew a picture of the heart chambers and valves for a science project. I thought the heart was pretty neat—an organ made up of a pump and valves. Of course, I had a very simplistic understanding of it at the time. We had red magic markers and blue magic markers so I made all the arteries red and all veins were blue, which was a very egregious error on the lung side of things!

From then on, my career choice was pretty straightforward: I liked engineering and I liked medicine. Cardiology allowed me to pursue both.

I was fortunate that I didn't have to be tortured about what I was going to do. I looked at other options, but I had a pretty good path. I don't think that most people are this lucky.

What Is Your Family Life Like Now?

I'm married with six kids, so it's never a dull moment when I go home. We still don't have an empty nest yet. One of our kids is an undergraduate, another is pursuing a PhD in Biomedical Engineering and a third works. Three others are now married, and they all still live in the Buffalo area. We have nine grandchildren. Since everyone is in town, weekends—and most evenings—can be interesting. I go home, and I never know who will be there. With nine grandchildren, sometimes three or more are visiting.



John Canty Jr

We frequently have our immediate family over for Sunday dinner, and we are up to 20 people now.

That's a Large Family! How Do You Balance Six Kids and a Successful Career?

My wife used to be a teacher. When I finally got a paying job as a resident, she retired to stay home and raise our kids. I often say that she has a more important and time-consuming job than I do. Her support has allowed me to not have to worry about some of the things that other people juggle when raising families with two careers.

As far as balance, I try to make my kids a priority. Raising a family is a team sport. But even still, I could not have done it without my wife. There were those rare circumstances—like AHA meetings when all six kids had the flu, but I needed to go and present the abstract!—when her support was absolutely critical. Every team needs a quarterback, and that's my wife.

You Sound Very Busy at Home. Are You Just as Busy at Work?

My work feels more like a vocation. I don't really look at it as a job. The work is so varied and always exciting, with discovery, teaching, patient care, mentoring, and career development. My wife tells me that no one is paid as well as I am to do a hobby.

On average, I work 50–60 hours each week, but, like most of us, I spend more and more time on the computer at home. I'm trying to get better about this but without success—despite trying for over 35 years!

That's a Long Time. Do You Ever Consider Retiring?

Not on the radar screen right now! I guess I still consider myself mid-career.

How Did You Start Your Career in Cardiology?

I've spent my whole life in upstate New York. I went to Rensselaer Polytechnic Institute in Troy, NY, for my undergraduate in biomedical engineering. Then I came back to UB for medical school. At the time it was uncommon for engineers to be accepted into medical school. Fortunately, my medical school interview was with a cardiologist, David Green, who was working with engineers at the time. He understood the importance of engineering in cardiology, and it must have worked in my favor to be accepted to medical school.

While in medical school, I had the good fortune to begin research in the division of cardiology with my first mentors Fran Klocke and Bob Mates. They had a Program Project grant which allowed me to participate in research related to coronary blood flow throughout my entire 4 years of medical school. This solidified my interest in pursuing a career in academic cardiology and wanting to get back into research as soon as I completed clinical training.

After graduating, I went 50 miles East to the University of Rochester for residency in medicine. They liked me in Buffalo and wanted me back, so Fran Klocke made me an offer to start a faculty position after just two years of residency with two years of cardiology fellowship at UB. It wasn't a formal short track program, but the Chair of Medicine could propose special candidates for the Boards if they were full-time faculty. That circumvented the usual 6 or 7 year training and got me back into research quickly. The UB cardiology division was a superb environment. I've since been privileged to spend my entire career at the same institution, which is unusual for physician scientists.

Do You Feel Like You've Missed Anything by Staying in One Place?

Since starting at UB, they've built a new research building every 15 years or so, and I've been lucky to be selected to move into them. We started out behind the hospital, then moved on to the main campus in the mid-90s. Now I'm in the new Clinical and Translational Research Center downtown, adjacent to where our medical school will move this Fall. I never would have thought I'd circumvent the city like this, but each time we've moved into a bigger and better research facility. Most investigators have to move to a new institution to get better space and facilities.

Did You Ever Consider Another Specialty?

When I was growing up, we had a pediatrician who made house calls who left a lasting impression on me. I liked dealing with children and strongly considered going into pediatric cardiology. The only problem was that I couldn't look at kids' ears as a medical student. If you can't look at ears, you'll never get through pediatric residency. Later on, my wife actually showed me how to do it with our children. She was self-trained, but 100% accurate in diagnosing otitis media as compared to our pediatricians. Unfortunately, at that point I was a bit far along in my career in adult cardiology to switch.

Why Did You Choose to Do Research Rather Than Focus Just on Practicing Medicine?

Pretty simple: I think research is exciting and fun. Each week is full of new discoveries and you never know what you're going to find. While we always set out with a hypothesis, many of our most important discoveries and contributions are completely unexpected and serendipitous.

The challenge—especially for young physician scientists—is figuring out how to balance everything: You need to be a good researcher, a good clinician, and respected in both areas. And you need to have time for your family. Even if you work 60 hours each week, you still spend most of your time at home. That time is important. So with the right culture and the right support—in the right environment—a physician scientist in academic medicine can be a very rewarding profession.

Do You Have Any Advice for Young Investigators?

I was fortunate that I had really good mentors who were as interested in my career development as they were in their own. A mentor is a key to a successful career in biomedical research. You can have all the research space and money in the world, but it will be very hard to succeed if you don't have that individual who is going to mentor you, championing your career and protecting your research time, especially in a clinical department. A mentor will celebrate your successes and help you through difficult times when your experiments consistently fail or your paper or grant is rejected. It's like the MasterCard commercial: those people are priceless.

What Are Some Qualities That Make a Researcher Successful?

You need to be observant, always watching for the unexpected. When you see something interesting, you need to be ready to pursue a different direction. You must be persistent.

When new students approach me about coming to the lab, I tell them that most of what they will do in the next two or three months won't work. It is a lot like fishing because you sit on the pier, just waiting most of the time. If you are the sort of person that

gets excited when things work or you catch a fish, you'll probably be happy in a research career. But if you're bored with waiting, or want everything to work, then research probably isn't for you.

What Are Common Mistakes That Young Investigators Make?

Since I'm in a cardiology division, I'll focus on physician-scientists. I think many feel the need to establish themselves clinically. So, at the start of their career, they tend to overestimate the time they need to spend in clinical work and underestimate the time they need to spend on research. They worry about losing their clinical skills. But without devoting time to developing a research program upfront, it becomes very hard to compete with full time scientists. For that reason, there is a fairly high attrition of new physician-scientists to full-time clinicians over the first few years of their academic careers.

What's the Ideal Balance?

The classical split is 50% for each, but your clinical time is really fixed. Since research time is more flexible, things like teaching, administrative roles, vacations, and scientific meetings eat away at it. It quickly becomes 40% or even 30%—which makes it hard to make any meaningful contribution.

I suggest reserving 75% protected time for research and assigning only 25% to clinical practice. That works well and it is the bar that most career development programs demand. Nevertheless, with the increasing demand for clinical income to support academic departments, it is becoming increasingly difficult to fund protected research time for our junior faculty. We increasingly rely on the extremely important NIH career development programs.

Do You Have Time for Hobbies?

Life outside the lab is important in a research career. You need to find balance and take a break.

I'm a sailor. I started about ten years ago when we bought our first boat. It's fun and quiet on Lake Ontario. While it can be a little technical and you always need to pay attention, I am actually able to get a lot of thinking done on the boat. It's frequently about science.

In the winter, I go skiing. One of the benefits of living in Buffalo is that the ski resorts are only an hour or so from the city. It's not the best, but they make snow and are usually open 4 months of the year.

What Are Your Favorite Books?

I'm not a big reader—I'd rather spend time with family or playing and teasing my grandchildren. But I do have three to recommend.

My favorite is *Oh the Places You Will Go* by Dr Seuss. Every scientist should read this. It's a lighthearted—but absolutely true—description of the ups and downs we face in research careers.

Another favorite is *Only the Paranoid Survive* by Andrew Grove. I like it mostly for the title, but it is a good book to read about strategic inflection points in business which also relate to changes in the direction of one's research.

And finally, I like the book *Connected* by Nicholas Christakis and James Fowler. It's how your friends' friends' friends affect everything you think, feel, and do. It discusses the surprising power of our social networks and how they shape our lives—of particular importance with a large extended family!

Disclosures

None.

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