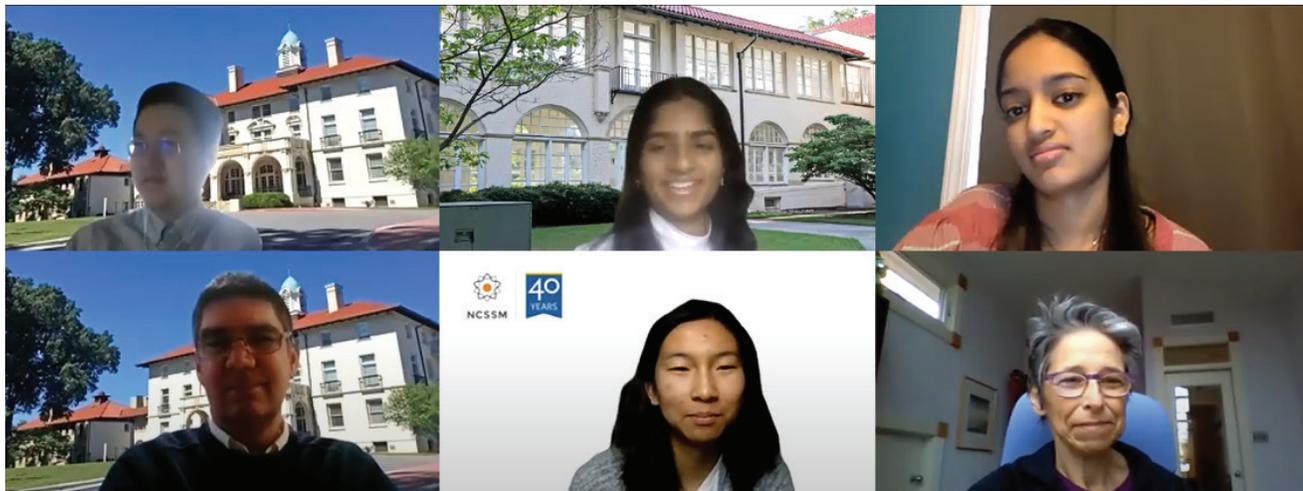


AN INTERVIEW WITH DR. PAMELA DOUGLAS



From left to right, top to bottom: Daniel Jin, BSS Publication Editor-In-Chief; Sriya Mantena, BSS Editor-In-Chief; Akshra Paimagam, BSS Editor-In-Chief; Dr. Jonathan Bennett, BSS Faculty Advisor; Shery Liu, 2021 BSS Essay Contest Winner; and Dr. Pamela Douglas, Ursula Geller Professor of Research in Cardiovascular Diseases in the Department of Medicine at Duke University and Director of the Multimodality Imaging Program at Duke Clinical Research Institute.

How and when did you become interested in cardiology?

I really became interested when I was working in the intensive care unit in my second year of residency. We really enjoy taking care of very sick patients because every brain cell is focused on getting this person out of danger and back to stability and that was very intriguing to me. As I started thinking about a fellowship or specialty after medical school, what was most interesting about cardiology was that clinical science was very respected in cardiology at that time. In most other specialties in internal medicine, if you wanted to be academic, you tended to need to do bench research. I was very interested in the intersection between clinical care and clinical science and not so much interested in basically going back to school to figure out how to become a bench researcher. I figured I'd spent my four years of medical school to become a clinician and a clinical scientist. So that was really how I made that decision was that I could do that combination of things, being a clinician, which I really enjoyed and a clinical scientist, which was intellectually stimulating to me.

Can you summarize your research in layperson terms? What has been one of your most memorable projects?

The bulk of my research is related to cardiac imaging, taking pictures of the heart and focused rather not on the pictures, but the information that we could get from the pic-

tures and how that information could drive improvements in outcomes or improvements in care and outcomes.

Probably the most memorable project was working on heart disease in athletes. [This project] was done in the setting of the Hawaii Ironman Triathlon over more than 15 years. We traveled to Hawaii every fall and set up a noninvasive laboratory on the beach to study the athletes before and after doing this incredible day of exercise, 2.4 mile swim, 112 mile bike ride followed by a marathon run, to see what it did to their heart.

And lo and behold their hearts. Some of the hearts looked fine, but some of the hearts looked awful and they also leaked muscle proteins, just like people having a heart attack. This was totally memorable to be where we were doing these studies, but also I had an incredible group of people to work with and found important discoveries with implications for clinical care.

How does your work in the clinic motivate your research? How do you navigate the dynamic between your work in the clinic and the lab?

You know, clinical care is all about the patient and the patient is totally at the center of that. When you're doing clinical research, you're using patient data, but the center of it is your research hypothesis. Hopefully you've selected a hypothesis that has important clinical implications and you've used it by having a question with patients like, so

you have chest pain, which tests should I order? I have half a dozen options and which is the best test? It sounds like a very simple question, but it turns out to have animated decades of research.

So I think they're very interrelated and the dynamic is of course that you need to leave one mind and start the other, but that dynamic in terms of keeping your enthusiasm fresh is you change, change venues and change thinking and change teams and, it keeps it interesting.

What are some of the greatest challenges you face in your work, and what have you learned from them?

I think the greatest challenge is to be creative and innovative, because if you can do that then of course the next challenge is convincing somebody to pay for the research that you want to do, and then doing the research and then can we think of somebody to publish it. I would say overall for my career, probably the biggest challenge is being a woman in a totally male dominated field.

When I became a cardiologist, less than 3% of the cardiologists in the country were women. And now it's maybe about 12%. And so you can see that over nearly 35, 40 years, we've not made a lot of improvement in that, and this is in spite of the proportion of people graduating from medical schools, half women and from internal medicine residency, half women. And then when you get into cardiology, it's just a cliff. And that has been both a challenge, but also, I mean, there's a silver lining in that as well. It's certainly a challenge to have to work twice as hard and be twice as good, but it's created some incredible bonds with women who were doing the same thing, and also the opportunity to change the culture of the field, which I think we are doing successfully now, so that it's much more friendly, not only to women, but other underrepresented groups.

As the President of the American Society of Echocardiography, the American College of Cardiology, and the Chief of Cardiology at both the University of Wisconsin and Duke University, how do you promote diversity and inclusion in medical fields? How would you describe the impacts of these efforts?

I think my biggest impact has actually been with the American College of Cardiology. I was president from 2005 to 2006 of that organization and then subsequently asked to lead their diversity and inclusion initiative, which we started in 2017. I have led that initiative and task force to the present, and I'll be rotating off in the spring. That has been a real learning curve for me. I joke that, you know, at the beginning of this, that I knew diversity and inclusion because I had experienced it, but there is a science to diversity and inclusion and there are best practices and there

are things that work and don't work and ways of going about it.

And I've had to learn all those things. We started out with doing a strategic plan, in which we really tried to define, "Why diversity?" We did it not in terms of individuals saying "I've been discriminated against," or "It's harder for me than it is for him," but in terms of what would make the field better and what the benefits to the field are in diversity.

And so our whole approach has been that we will do better science. We will be more innovative. We will have more functional teams. We will make better strategic decisions. We will take better care of our patients. We will also be accessing much more talent and promoting and developing that talent if we take a diversity and inclusion lens to everything that we do. And we have approached this through changing the culture through education and communication, through collection and publication of data, through really changing how the American College of Cardiology does business. It's got diversity and inclusion principles. Now it has diversity competencies for leadership. We have diversity professional development programs for underrepresented groups. And in addressing the pipeline, a deep pipeline issue as well as that residency cliff issue. And we have successfully changed the culture in the ACC and it's starting to trickle out to the rest of cardiology. We haven't changed the field entirely. There's a lot of work left to be done.

And, you know, the Black Lives Matter movement has shown us how much systemic, structural prejudice there is in our institutions and in our professions, not just about race, but also about sex. And so there's a lot more work to be done to do that, but the impact of this effort, I think, has been really large in the organization. I'll be modest here, but you would see it on my CV that ACC a few years ago created a diversity and inclusion leadership award, and last year they named it after me. So I think it's a recognition that not only have I done a lot, but that it's really truly valued by the profession.

As a researcher working in the medical field, what can you say about the ethical issues that you've faced in your work? How do you think students interested in going into STEM fields with possible human impacts, such as medicine, should prepare themselves?

I think ethics is very important, and if you try to create a clinical trial, the first thing you need to do is create a hypothesis for which there's equipoise, which is a really important word in clinical research. It means we don't know the answer. And so that we would be equally comfortable if a patient had X therapy or Y therapy.

Having equipoise is at the core of ethics, because if you don't have equipoise, you can't ethically do this study. You can have a guess as to which way it's going to turn out, right? That's your hypothesis and you structure the organization and the details of the trial design around that hypothesis.

But equipoise is really critical. And then how that plays out in terms of informed consent—which populations do you test? I think it is very important. A lot of this, I don't know that at a high school or college level is critically important to work on, unless you have a particular interest in the science of patient engagement, and that is increasingly becoming recognized as we transition to clinical care.

When we talk a lot about patient-centeredness, I'm not sure we always do it very well, but clinical research also needs to be patient centered and how you include patients in the research, not as subjects you do something to, but as people who help design the study and help conduct the study and the interpretation of the results. I think those things are all very important. They're very rich areas of research alone. How do you engage patients? How do you recruit them and retain them?

Why did you choose to study heart disease in women specifically?

I was doing all this athlete research and somebody asked me to write a chapter in a gynecology textbook, obviously about women, on exercise. So I said sure, and proceeded diligently to go to the library to read up on everything I could about exercise and women. There was a whole literature about how cardiac stress testing was less accurate in women than in men. And I thought, well, how come we don't know this? If I take a woman as a patient and do this test, how come I don't know that I need to interpret those results differently than I do for a man?

If you take a mixed population of people whose results need to be interpreted one way and then another way and mix them all together, you're blending apples and oranges, and you're not going to get very clear indications for either group, quite frankly, because they will each dilute the other.

And so that's how I got engaged in it. I took it upon myself and I wrote an editorial in *Circulation*, wrote a perspective, and said, "Hey, you know, we don't know the information about half our patients. How come we don't know this? We need to study heart disease in women." There were some early things that we were studying a lot like bypass surgery because it was fairly new in the 80s and it turned out women did worse than men. I thought, well, that's really interesting. Let's find out why women did worse than

men. And a lot of it turned out to be about body size and the size of the bypass grafts. They were much smaller in women because women were smaller and so they tended to close off sooner than in men, which was an important finding in women.

It also was an important finding because the same was true for small men. When you're looking at risk for bypass surgery, you need to look at vessel size and body size. If we hadn't done the research to try to understand the difference in outcome with women, we would never know that for men.

At NCSSM, many students are interested in pursuing STEM fields in college and beyond. Do you have any advice for these students?

I would urge you to think and learn broadly. If you're interested in STEM, increasingly, medical schools are very interested in something called holistic review, which is not just how well you've done in your Organic Chemistry class or on the MCATs but, what kind of person you are. Are you culturally competent? Are you empathetic? Can you relate to people? Are you ethical?

Be a human being. An empathetic, warm human being who can take care of others, and know how to access the literature and think critically. These are all things that are really important. I would also have to say that when somebody comes to a medical school application or a residency application, and they've published in the sciences and have a very strong letter of recommendation from a research mentor, that's very powerful. So do both. Be successful in science, but also be successful as a well-rounded human being.

How has COVID affected your day-to-day work as well as your research goals?

Our research building is in downtown Durham and it closed in March of last year. I have not been to my office for 10 months. I don't even know what's in there anymore. We do almost everything by Zoom and email now. We miss the contact and we miss the social interstices of a meeting where you're, you know, walking somebody back to the office or you meet them in the break room. I stopped doing clinical work at that time, being in a high-risk group because of COVID, and have not gone back to doing clinical work. So that was a big change, and also very personal. In terms of day-to-day work, that was about a third of my time.

What do you enjoy doing outside of work?

Having a little bit more flexibility in my time, one thing that I've done is intensified a meditation and yoga practice that I've had since the pandemic. It's really nice to be able to be flexible with my time and not have to show up in the office in the morning and leave late at night. Just things that you do at home, basically, scratch the cats. I have a garden. We do have a beach house that we are very lucky enough to have an escape to periodically to get a change of scenery and the North Carolina coast.

What do you see for the future of cardiovascular medicine? What plans do you have to continue your research?

I'm actually writing two grants right now. One is a sub study grant for a large cohort of patients in rural South Appalachia in the Mississippi Delta who have an incredibly high burden of disease, but have basically never been studied at all. This is a fascinating group to study the logistics of getting medical equipment and personnel to the deep, rural South, which has been challenging. We've met that by using an artificial intelligence guided ultrasound machine, which guides an unskilled observer to take pictures. It's all very exciting and forward looking, but also very human in where the sample lives and wanting to understand the social determinants of health in an area where we don't even know the medical determinants of health, because these people just don't have access to medical care.

The other grant that I'm writing is a large 8,000 patient cohort of patients living with HIV in whom we're doing a cardiac prevention trial. HIV imposes an additional cardiovascular risk above the usual risk factors, and we're doing a randomized trial using statin medications. We'll be following these patients to look at all different kinds of accelerated aging in the kidneys, liver, muscles and so on as a consequence of HIV. These are all problems that have become relevant because of the incredible success of HIV treatments in the last two decades. Now, these patients are living long enough and healthy enough to start encountering chronic diseases, and it turns out at a much higher rate than usual.

I think the future is wide open. There are so many populations to study, so many questions to ask. I think we're going to broaden the scope of less conventional research, such as implementation research, to bring what we learned in conventional studies to the clinic. It's a time of very rapid change. 10 or 20 years ago, we would have said, it's very narrow. Just how do we get drugs and devices to the market and then make sure we don't have side effects afterwards. Now it's much bigger than that - it makes it very exciting.

What motivates you?

I guess there's a certain selfish motivation. I do the stuff that I enjoy. But then the question would be, why do I enjoy it? On the selfish side, it's intellectually interesting. But I think if it didn't make a difference, I wouldn't do it. When we do a clinical research project, one of the things that we start very, very early on asking ourselves is how is this going to change care? How is this going to have an impact? If it's just going to be an intellectual finding that checks a box, I'm not very interested. I want to do work that has an impact. Whether it's an impact from the research or an impact from a diversity and inclusion initiative to really improve people's lives and improve our field, I think we all want to improve the world.

What gave you the confidence to enter such a male-dominated field? What pushed you to take on that challenge?

I didn't see the barriers. If you ski and you're skiing in trees, if you focus on the trees, you will hit the tree, so you've got to focus on the gaps. And so I just said, well, this is what I want to do. I don't see any reason why I shouldn't do it, so I just plowed on. I was the third woman to go through our fellowship program ever at Penn. And I was the first woman hired on faculty in cardiology at Penn, and then later, in 2000, when I went to Wisconsin, as chief, I was the only woman on the faculty in cardiology. Somebody asked me the question, "Well, you're going to be the only woman in the whole cardiology division, how are you going to deal with that?" My answer was I'm the boss. It doesn't bother me at all. And how are the men going to deal with it?

Do you have any tips for us to implement practices of diversity and inclusion in the teams we're a part of such as classes and clubs?

I'd urge you to do some thinking to really internalize why you want to implement these practices and what you hope to gain. Yes, it's moral justice, social justice. It's morally the right thing to do to have diverse teams. But beyond that, why does it serve the enterprise and how does it serve the enterprise? That elevates it from being "How do I treat you" to "How do we do this better together." If you start there and then look at the barriers to being better through that diversity lens, then I think you'll find specific strategies and tactics that you might engage in to make things more diverse. I would also make sure that you listen to underrepresented colleagues. If they're not joining a club, why aren't they joining a club? Why did they feel excluded? Why does this club's purpose not resonate with them and what might resonate better? Listening is really important to identifying those barriers and you might be surprised as to what you learn.