

Pioneer Perfusionist Interview: Joseph Sestino

Mark Kurusz: Well, today is Thursday, April 16th, 2015. My name is Mark Kurusz. We're in Tampa, Florida, at the AmSECT International Conference, and we're going to be interviewing Joseph Sestino today. Welcome, Joe.

Joseph Sestino: Thank you. I'm glad to be here.

Mark Kurusz: I have to tell you that the names of individuals to be interviewed were submitted by the AmSECT Executive Board, and I refused to get involved in the choosing process. So, I think it's important for you to know, as well as the other interviewees, that your peers have selected you to be interviewed.

Joseph Sestino: Thank you.

Mark Kurusz: The purpose, I think, is to not only just capture the footage today, but at some point, we may take some excerpts from the Pioneer Interviews and put them on the website. It's my hope, too, that we'll do a transcript and, of course, we'll let you and all the other interviewees have a chance to see what the edited final version looks like. So, without further ado, I'd like to ask you, what were the circumstances that led you to get into perfusion? What was your background before you got into perfusion?

Joseph Sestino: Well, when I found out about perfusion, it was actually when I was in high school. I was in an AP biology class, and I wrote a paper on open-heart surgery.

Mark Kurusz: Really?

Joseph Sestino: It was May 1970. I actually, still have a copy of that paper at my house, and I was going to show it yesterday at the award ceremony. And there's a whole section in the middle on cardiopulmonary bypass. One thing it does say in there is that, the surgeon stops the heart, and that was just at the beginning of cardioplegia, so I don't know how accurate that was. But, I knew there was this thing called the heart-lung machine, and it was used for heart surgery, and it also said in that paper that there were a lot of cardiac conditions that were not correctable by heart surgery. So, that was before Norwood operations, single ventricles, and everything.

Mark Kurusz: Sure.

Joseph Sestino: I remember one time, when I first started working, hearing about a patient with a single ventricle, and they said that nothing could be done for that patient. But, I knew in the back of my mind that there was such a thing as a heart-lung machine. And when I went to college, I got involved in the ambulance corps. At our university, I started the ambulance service on campus, and I was very active with that in the first two years. And then I got into this cardiorespiratory program at the State University of [New York at] Stony Brook. About four years ago, I got a call from the State University of [New York at] Stony Brook saying that

ambulance corps has two buildings now and has a budget of half-a-million dollars a year. So, it's still in existence, and I had no idea and there's 150 people that are part of that department now.

Mark Kurusz: Wonderful.

Joseph Sistino: So, I was the first president of that. So, I started that in school, and then I heard about this cardiorespiratory program, so I went into that program. And that program was a combination of respiratory therapy, cardiopulmonary technology, and perfusion. So, we did rotations in all three. So that's where I learned about perfusion through that program. And then, after I graduated, I started—there was a job available in Respiratory Therapy. So, I did that for about six months until a job became available in perfusion, and I started at Long Island Jewish Hospital in perfusion with Richard Chan.

Mark Kurusz: You did your undergraduate work at Stony Brook?

Joseph Sistino: State University [of New York] at Stony Brook. And it was mostly cardiorespiratory physiology with a small perfusion component to it.

Mark Kurusz: Really?

Joseph Sistino: Yeah.

Mark Kurusz: And you mentioned Richard Chan. When did you first come in contact with Richard?

Joseph Sistino: He was a clinical instructor. He actually came out to Stony Brook and gave some lectures, him and Richard Narvaez. Rich Narvaez was the Chief, and Richard Chan worked with him. They came out and did lectures. I believe we did animal lab, too, out of Stony Brook. And then, I did a clinical rotation at Long Island Jewish Hospital.

Mark Kurusz: So, they both were at Long Island Jewish and would go out to Stony Brook to lecture?

Joseph Sistino: Right.

Mark Kurusz: Okay. Well, you had a job as a Respiratory Therapist, is that right?

Joseph Sistino: Yeah.

Mark Kurusz: How did you transition over to perfusion?

Joseph Sistino: So, the job in Respiratory Therapy was at Saint Francis Hospital, which is a nearby hospital, which used to be a place where people went with heart surgery to basically

die. There was no treatment for heart surgery before the 1950s. So, like a sanatorium, maybe. I'm not sure you'd call it that. But it was a place where people with congenital heart disease to go and die, and then they eventually created a cardiac program there. But, when I was working there in Respiratory Therapy, all the patients were dying. The whole ICU was filled with patients on ventilators, and they were all dying after heart surgery. And I would see patients before surgery, and half of them never would come out after the surgery. So, after a couple of months of that, when I got offered the job at Long Island Jewish, so I went back to Long Island Jewish. Now, at that time, Long Island Jewish published a paper. They did 300 cases in a row without a mortality. Mostly, CABGs, and they were very good at that. There was no ICU. The patient went right into the recovery room right after surgery—very fast pump runs, and the patients did great. But then when I went to this other hospital, I worked in respiratory, the results were very poor. Eventually, they published mortality rates for that hospital, and they were 10% in the newspaper. 10% mortality at that time. So, anyway, I learned a lot of good techniques at Long Island Jewish. And then, in an interim I went to work at another hospital called Nassau Hospital, where I was the only perfusionist for about a year. And at that hospital, they were using a Cleveland Clinic technique of bypass. They had two venous lines, two three-eighths venous lines that came all the way back to the venous reservoir. And I basically took their circuit and made two perfusion circuits out of one tubing pack. There was so much tubing, and I worked there for a little while, and then was asked to go back to Long Island Jewish as the Assistant Director. I was pretty young to be in any kind of management role, but it was a good experience for me.

Mark Kurusz: Sure. So, the courses that you got at Stony Brook were really introductory courses—your perfusion training didn't start in earnest till you went to Long Island?

Joseph Sistino: Right. When I went to Long Island Jewish, I read every perfusion book I could get my hands on at the time I was there. And, I remember I did a case report. I had to do a case report at the end of the rotation with the surgeons and the perfusion staff, and my patient was a New York City bus driver. And I found a paper comparing bus drivers to train conductors and the incidence of coronary disease. Now, I don't how I found it, because there's no internet search at that time. But I found it, and it showed it was a much higher incidence of coronary disease in bus drivers.

Mark Kurusz: No kidding?

Joseph Sistino: It was sedentary and distressful driving in a crowded city. So, I think when I did that presentation, they were pretty impressed that I found that paper.

Mark Kurusz: Sure.

Joseph Sistino: So, it was a really good experience for me to be at Long Island Jewish.

Mark Kurusz: Well, you referred to some books that you could put your hands on. What books stand out during...?

Joseph Sistino: Galletti—I read that from cover-to-cover numerous times. John Norman’s book on cardiac surgery, and that had a portion of a chapter written by Jim Dearing. And, he talked about perfusion as a profession. He talked about the need for university-based perfusion. And at that time there was controversy with other perfusionists, whether should be university-based or post-college certificate program. And so, Jim Dearing in that article talked a lot about the university program that he had established at Ohio State, so that’s when I first realized it was a real profession.

Mark Kurusz: Sure. And where did you present the case report? Was that locally...

Joseph Sistino: Yeah, that was with the surgeons at the end of my clinical rotation.

Mark Kurusz: ... at Long Island?

Joseph Sistino: At Long Island Jewish, yeah.

Mark Kurusz: Well, now that we’re on that track, can you remember your first national presentation?

Joseph Sistino: Oh, yeah. Well, I got encouraged by Jeff Riley to get involved in presenting. I presented at a local meeting on a patient that needed a liver resection. It was a child, and we did use bypass as a rapid transfusion system. So, I presented that at a meeting in New York, and Jeff Riley was there. He was the Editor of the journal at the time, and he came up to me and he said, “You should really write that up.” So, I wrote that up. And then, the first time I actually presented was at a AmSECT meeting in California, in Anaheim. And, at that time, we didn’t have PowerPoint, so we had to use slides. And I got these special blue slides so that the typewriter was in white, with blue background.

Mark Kurusz: Blue diazos.

Joseph Sistino: We spent a lot of money getting those slides, and that was the highest technology at that time, so it was a national meeting. So, I went out into this auditorium, and it was a beautiful, almost like a theater, wraparound theater, and everybody was in the audience, and it was packed—the room was packed. And I could not really see anybody in the audience when I got up to speak, but the room was full because the speaker before me was from Johns Hopkins, and they were talking about separation of conjoined twins on [cardiopulmonary] bypass.

Mark Kurusz: Oh, my goodness.

Joseph Sistino: So, that was just an amazing presentation. I had to get up after that, and I did a survey of blood conservation techniques after [cardiopulmonary] bypass, how people—whether they were cell saving the blood, or whether they were hemoconcentrating. And it

allowed me to read a lot of papers about blood conservation. I was very interested in blood conservation during that time.

Mark Kurusz: Sure.

Joseph Sistino: And that's an interesting story how I got interested in blood conservation.

Mark Kurusz: Well, I'd like you to tell me about that in just a moment. But I'd like to know how long your formal training was when you were trained by Richard [Chan] and others there at Long Island?

Joseph Sistino: It wasn't really that long. Once I started the job, that's where my training really occurred. The school part was not that long, very short. Because we were trying to do respiratory therapy, cardiopulmonary technology, and perfusion, so we had rotations in all those areas. But they weren't that long, the rotations.

Mark Kurusz: Well, I preempted you—you were going to talk about blood conservation and your early interest.

Joseph Sistino: I got really interested in blood conservation around 1980. I had a case at a hospital, and at the end of the case, the patient was bleeding. So, the surgeon said, "Give the protamine and then just turn the pump off when the pump clots." And so, we went through those steps, and the pump clotted, and then the surgeon turned around and said set up another pump. So, that happened twice. One I remember was a mitral valve where it was a Bjork-Shiley valve that tore through the back of the left atrium, and it was not repairable. But anyway, I went to the other surgeon who was Chief, and he says, "You have to start using these cell saver devices." They just came out, cell savers. So, I went to a meeting in Boston at Haemanetics, and I learned all about cell savers, and I became very interested in blood conservation. And at that time, it was the beginning of the AIDS crisis, 1981, 1982. It was just that blood conservation was just really important. So, I got interested in just in time for that. So, that's how I ended up doing the survey a couple of years later.

Mark Kurusz: How long did you stay at Long Island Jewish?

Joseph Sistino: I was there for five years, and then there was a job opening at Montefiore Hospital in the Bronx, and a Chief's position. And I was 26 years-old, and I applied for that job, and I didn't really think I was going to get the job, but I think I got the job because I was almost done with a Master's in hospital administration. So, I started that a year after I finished at Stony Brook. I started going at night and on weekends to get my Master's in Hospital Administration. So, I mean, they did grill me on physiology and cardiac and pulmonary physiology as part of the...I had a cardiologist and a surgeon, both grilled me on physiology. And then, I think the fact that I was going for a degree, I think it really helped a lot.

Mark Kurusz: Sure.

Joseph Sistino: There were a lot of other people that applied for that job. I know for sure. And I was definitely the youngest one, but I got that job.

Mark Kurusz: And how big a team was there at Montefiore when you started the job?

Joseph Sistino: Oh, there were nine perfusionists there, and none of them had been trained formally in perfusion. They were all on-the-job trained, and a lot of them were transferred from other departments in the hospital—like one worked in the warehouse and in shipping, another person worked as a pharmacy tech. A couple of people, I don't even know where they started. They had no formal education, medical education at all. They used three perfusionists to do perfusion. One to watch the level, one to scrub in and hand off the lines, and the other person that ran the pump. It was three people.

Mark Kurusz: Amazing.

Joseph Sistino: And so, my goal at that time was to bring in, since there was no perfusion school really nearby, was to bring in nurses and Respiratory Therapists and train them to do perfusion, which I did. I trained a lot of people before 1981, before the deadline in 1981.

Mark Kurusz: Did you really?

Joseph Sistino: Plus, we had Stony Brook students for a while. So, yeah.

Mark Kurusz: It must have been challenging.

Joseph Sistino: By the time I left, almost everybody [on the perfusion team] was either a nurse or a Respiratory Therapist. Well, at least they had a medical background, so that when I worked with them, I could communicate with them on a higher level than the staff that I had.

Mark Kurusz: And the warehouse guy.

Joseph Sistino: When I first started, yeah.

Mark Kurusz: Sure.

Joseph Sistino: I mean, I can give you a couple examples. They didn't use any ACTs at all. They had arterial filters, but no ACTs. They used wall water, and during rewarming they would turn off the cold water from the wall. So, they did have a case where a patient got severely burned. And so, there were a couple of practices that were really outdated. But that's the first place I ever used cardioplegia, and that was not good. We had very bad results with crystalloid cardioplegia.

Mark Kurusz: Really?

Joseph Sistino: Terrible results with crystalloid.

Mark Kurusz: Well, we might get into that shortly, but clearly that was a real challenge.

Joseph Sistino: Yeah. I like challenges. And so, when I left that institution 11 years later, I mean the surgeons really recognized the work that I did there...

Mark Kurusz: Sure.

Joseph Sistino: ...to bring that place up to what it should be in perfusion.

Mark Kurusz: Where did you go next, Joe?

Joseph Sistino: I went to Columbia Presbyterian Hospital in 1990, and I was there for about four-and-a-half years.

Mark Kurusz: And you still lived on Long Island?

Joseph Sistino: No. Half the time I was at Montefiore, I moved up to Westchester, so I was closer to Montefiore. And then when I worked at Columbia, it was a little bit further, but Columbia's on the West side of New York, and it's pretty north. So, getting there wasn't too bad from Westchester.

Mark Kurusz: And where did you go after Columbia Presbyterian?

Joseph Sistino: That's why I came to Medical University of South Carolina.

Mark Kurusz: And tell me how that came about. Did they recruit you, or did you apply?

Joseph Sistino: No, I applied for the job. It was a time in my career when my kids were young enough that I could move. And I didn't really like the union environment in New York City. I had trouble getting rid of some employees that were not the best, and the union would fight me on it. And so, I really didn't want to be in that atmosphere anymore. So, I wanted to teach, and I don't know. I always have dreams of the future, and one of them was to work with Jeff Riley and learn from him. So, that was my dream. I said, if I'm going to go somewhere, I'm going to go someplace where I can really learn something.

Mark Kurusz: So, Jeff Riley was at the Medical University of South Carolina at the time?

Joseph Sistino: Yeah. He was Chief there.

Mark Kurusz: Okay.

Joseph Sistino: So, he recruited me at that point.

Mark Kurusz: Well, that was a big move for your family, wasn't it?

Joseph Sistino: Yeah, my wife actually didn't come with me at that time. She took one trip to South Carolina. She said, I'm not moving here. So, she said, "You go and check it out. And then if you really like it, we'll come down." So, my family came down three or four times. Every time they came down, they loved it even more. So, by the time the seven or eight months were up, they were convinced. And I was living on my sailboat during that time. I brought a sailboat down from New York. So, I was really happy during those seven months. It was great. I had a great time.

Mark Kurusz: This is pre-mobile phone era. Did you have a telephone on the boat?

Joseph Sistino: Yeah, I had a cable TV, and I also had a phone line on my boat.

Mark Kurusz: Really?

Joseph Sistino: Yeah. Had a phone on my boat and with a line that went to the dock. And my rental was \$175 a month, five-dollars for electricity, which included the little heater around my boat, and the cable was included. So, my expenses were pretty minimal during that time. And I lived about five miles from the hospital, so I could be to the hospital really quick.

Mark Kurusz: And what timeframe was this? Was this the early 1980s?

Joseph Sistino: I got there in November of 1994.

Mark Kurusz: Oh, okay.

Joseph Sistino: Yeah. Fast forward to 1994. So, it's 20 years that I've been there now.

Mark Kurusz: I was going to say...

Joseph Sistino: Yeah, it's 20 years.

Mark Kurusz: ... you've been there the longest of any job. And you've done a tremendous amount of work with the training program. How long was it before Jeff left the Medical University of South Carolina till you...

Joseph Sistino: I think it was about 1998, he left. So, 1994 to 1998. So, we worked together for four years, and then he left, and he told me that he drove...I was up in Myrtle Beach because we had a contract in Myrtle Beach, and every seven weeks we would do a case in Myrtle Beach. So, I went up to Myrtle Beach for my week, and then he called me up, and he said, "I'm coming up to visit you." And he drove up and he told me he was leaving.

Mark Kurusz: So, when he left, were you the heir apparent, or did you have to apply for it?

Joseph Sistino: No. I applied for it, and I actually didn't get the job. Somebody else got the job, and then they stayed for a year, and then they left. And then, I guess, I was the next one up on the list. I told them when I first got there, I did not want to do management. I wanted to teach, do clinical, but I did not...I had Montefiore for 11 years in management, and managing 15 perfusionists at Columbia. And it wasn't really my goal to go there and be in management. I really wanted to do clinical and teach and do research. But then after he left, it left a void, so...

Mark Kurusz: You did end up in management?

Joseph Sistino: ...I stepped up to the plate, yeah. So, for 13 years I managed a perfusion program and the hospital program, both.

Mark Kurusz: Oh, boy.

Joseph Sistino: So, the hospital program was about 900 cases a year. We had nine faculty that taught in the school and did all the cases in the hospital. So, it's like every emergency. I mean, I didn't run the schedule all the time. I tried to delegate it, but after a while the other perfusionists came to me, and they wanted me to run it because they didn't feel like everybody was being fair to each other. So, I ended up getting the day-to-day management back again. And I took call for 10 years, after 10 years. First five years, I took full call. The second five years I took second call. And after 10 years, I started in the PhD program, and I knew I wasn't going to be able to take call. So, I told them I couldn't take call. So, I finally got off call. I still did about 100 to 110 cases a year, mostly pediatric.

Mark Kurusz: Really?

Joseph Sistino: Yeah.

Mark Kurusz: So...

Joseph Sistino: I still...

Mark Kurusz: ...the big pediatric program.

Joseph Sistino: Yeah, the pediatric program's really good. They do about 300 cases a year, or we do 300 cases a year and [have] very good results. We have one of the lowest mortalities in the country. Our mortality is about 1% overall, and the average in the United States, about 3.5%. And that includes all comers, and our Norwood mortality is extremely low. So, we have really good outcomes. So, I like doing that. We don't do a lot of research. And so, in terms of national rankings, I think we're ranked 18th or something. But in terms of mortality, we're better than any other place.

Mark Kurusz: So, that brings us up pretty much to the present. Has your job evolved in any significant way in the last five or six years?

Joseph Sistino: Yeah. Well, when I got my PhD, I actually started...I knew I wanted to get into a PhD program, but there was nothing really available for me to get into part-time. I applied to the College of Graduate Studies, and for some reason they allowed nurses to be part-time students. So, I thought I was going to be able to get in on the same kind of way that they do it. But they said I couldn't be in the graduate study because I couldn't be full-time. So, I was really disappointed in that. And so, I met with the professors there, and they told me, "Well, take this course in clinical research. Get a Master's in clinical research. And then all those courses are part of the PhD program. So, you'll be able to transfer those." So, I started in the PhD program, but it was the Master's in clinical research. So, I started that, and I finished that in 2005. And so, that was my second Master's degree. And then they were supposed to start a program in our college. And I was actually on the planning committee to help start that. But our college is very rehab-oriented. There's a lot of PT—physical therapy, occupational therapy. And so, they decided to make the PhD in rehabilitation sciences because there's so many PhD faculty in that area. So, there's another component to it called health services. We have a couple experts in health services. So, that's what I ended up doing my research in. And even though it was called PhD in rehabilitation health sciences, but mine is really more health services and health services, the outcomes research. So, I finished that program in 2012 and defended my dissertation. So, that took me three years, but I had a lot of credits from before.

Mark Kurusz: Sure.

Joseph Sistino: So, that was the only way I could do it. I was officially full-time. Full-time is nine credit hours. So, I was taking nine credit hours a semester. And, usually six of those were actual classes that I was attending, and usually three were independent study. So, my two areas of interest were neonatal, long-term outcomes in neonates. And whether they developed, I was using an ADHD—attention deficit hyperactivity disorder, as a marker. And I was looking at the outcomes in kids. I was really interested in circulatory arrest versus cerebral perfusion. And the other area did a lot of papers in was simulation. I was trying to develop a body of knowledge in simulation. So, those are the two areas I did most of my independent studies on. So, has it changed my job? To get back to your question. Yes. It changed my job because in 2012, after I finished my degree, we split our program so that the college that I work for no longer provides the clinical component except for our 40 cases that we do a year to maintain our certification. And so, there are two faculty in the college, and the rest of the perfusion faculty all went to work in the hospital. So, we split our program. It was more like a traditional program. We were the only college that had that much faculty, what we call faculty practice. So, that comes with a lot of challenges. But, I mean, in terms of the students, it allows me to devote my time a hundred percent to the students. So, that's great for the students. In terms of income, it makes it more difficult to fund our program because we lost a lot of clinical income. We don't have the expenses of those salaries either. But the way colleges worked, there's a lot of overhead in colleges. So, in order to pay the bills, you have got to pay all the overhead first, the tax or the overhead, and that's quite substantial. And most of the income is related to tuition. So, the bigger class you have, the more income you're going to have. So, in perfusion, traditionally of small programs, so they don't really have that much income.

Mark Kurusz: What is your typical class size? And, I assume you have a senior class and a junior class?

Joseph Sistino: Yeah. Junior class now is 18 and senior class is 14, and we're probably going to go up to 21 this year. And I like having multiples of three because with research projects, we do research projects with three students on a project now. So, it's small enough that they can work, but it's big enough that they can divide up the assignments and the work between the group.

Mark Kurusz: So, a practical question, with three students on a research project who becomes the first author?

Joseph Sistino: That's one of the things we solve early on when we first talk about that. We actually have research policies, and it talks about who gets credit as first author. And it's based on calculation of effort for each part of the paper. So, if you have the idea for it doesn't mean that you're first author. If you do most of the work, then you get to be first author. And it could change during the process. If somebody doesn't do their part, then we consider that. But we have research policies that the students have to sign, and the biggest section is on authorship. And I've taken that from multiple sources in order to solve that early on because that always can be an issue. So, a lot of times you'll see at the meetings, one student will be the first author and then another student will present the paper—that's why. Because they decided to split it up. And the first author really is responsible for the editorial part of it. So, when the paper comes back, they're responsible to keep that...

Mark Kurusz: They're the point person.

Joseph Sistino: ...Exactly.

Mark Kurusz: So, tell me what month in 2012 did you get your PhD, Joe?

Joseph Sistino: It was August 2012.

Mark Kurusz: And tell me, did you have a party after that?

Joseph Sistino: Yeah, we had a pretty good party. I don't know, it's just...my wife got me this great t-shirt. It says, "PhDinshed" on it. So, "PhDinshed", finished. So, I got a great t-shirt, and we had party at my house, and it's pretty special. I was 59 years-old. My goal was to do it before I was 55, but then they didn't start the PhD program until 2009. So, I was waiting for that to get started.

Mark Kurusz: Yes.

Joseph Sistino: I was in the first class, and there were seven students in my class, and I'm the only one that finished. Nobody else finished.

Mark Kurusz: Really? Wow.

Joseph Sistino: I knew what I wanted to do for my research when I got into the program, and I knew exactly I wanted. Look, I wanted to contact all these families 10 years later and find out how the kids were doing.

Mark Kurusz: Sure.

Joseph Sistino: And then I wanted to see whether the ones that had circulatory arrest were doing better or worse than the ones that had cerebral perfusion. Because in 2000, we started doing cerebral perfusion. And the five years before that those patients had circulatory arrest. So, I had almost 13 years of data on patients. I just had to find the patients. So, I found about 45% of the patients from that cohort. So...

Mark Kurusz: That's a pretty good percentage to find.

Joseph Sistino: ...Well, when I sent it off for publication, they say it's very low. But 10 years later, fortunately, in South Carolina, we have this consortium of all the pediatric...We're the only pediatric heart program in South Carolina.

Mark Kurusz: Really?

Joseph Sistino: So, we have a Children's Heart Network of South Carolina that maintains records on all these patients. So, unless they move, or the other problem is people change their names a lot. You'll see as children get adopted or move foster homes, whatever it is, the names change. That to me was the hardest part, trying to keep track of who's who. Because I was matching up the perfusion records with the surveys that I did. And so, the surveys were on ADHD and a child health questionnaire finding out how they were doing. Because I wanted to have two different separate ways to categorize them as if they had ADHD. About 45% of the children have ADHD from their cohort.

Mark Kurusz: And have you looked at enough outcomes to be able to say cerebral perfusion is better than circulatory arrest?

Joseph Sistino: No, that's the latest paper that I submitted. We don't have enough data to show difference between the two.

Mark Kurusz: No, not even any trends at this point?

Joseph Sistino: No. Only thing we found was that patients that are certain diagnoses that are associated with genetic disorder, like interrupted aortic arch, that group had over 80% ADHD.

Mark Kurusz: Okay.

Joseph Sistino: So that's what we published. So, it's more genetic than—it's not a modifiable factor that we could do in the OR. I'm looking for something in the OR.

Mark Kurusz: Sure.

Joseph Sistino: Whether it's hematocrit, alpha-stat, pH-stat...

Mark Kurusz: Blood flows.

Joseph Sistino:..cerebral perfusion. There's a lot of good physiology on ADHD in neonates all related to blood flow. So, I thought that it was going to be a perfect...I thought that perfusion was going to be related to ADHD but haven't been able to show that. But still the numbers are very small, so...

Mark Kurusz: And this is ongoing research that you're...

Joseph Sistino: No. Once I get this paper published, then I would like to maybe write a grant for a multicenter study. But I don't know if that's going to happen. I'm still trying to get this part of it published. The last part, I published three papers for my dissertation. The first one was on pathophysiology of ADHD related to [cardiopulmonary] bypass. The second one was on the prevalence of ADHD in cardiac patients and the effects on the health status and it's behavioral issues related to ADHD after cardiac surgery. And then, the third one, is a relationship to the method of cerebral protection, and that's the one I really want to get published. So, I'm working on that.

Mark Kurusz: That's the holy grail.

Joseph Sistino: That's the one I'm really working on.

Mark Kurusz: Sure. Well, I'd like to shift focus now a bit, Joe, and ask you as you look back on all the places you've worked, instructors you've had, colleagues at your job, are there any surgeons or perfusionists or anesthesiologists that stand out as particularly memorable or somebody who really influenced you in a very significant way?

Joseph Sistino: I think I took something from everybody. The first surgeon I worked for, his name was Dr. [George] Wisoff, and he was very fast. He used to shake a lot, and almost like Parkinson's-type shaking in the operating room, but he was so fast, and he was an excellent surgeon. And I learned from him that if somebody's not ready to do something, that you should always be planning ahead, your next step should be in...The reason he was fast is not because his hands were fast is because he already had the next step of the operation planned what he was going to do. So, he would just move on to the next step, into the next step, and it taught me to think ahead. And when I worked at Nassau Hospital, it was a small hospital. And it was the kind of place where it was like a family where everybody knew each other. And so, that was a nice place to work, but I wanted to go do pediatrics again. So, I went back to Long Island

Jewish. And then I went to Montefiore, and the surgeons there, they were really great to work with. Most of them are retired now, but they were really great to work with.

Mark Kurusz: Any names jump out?

Joseph Sistino: Dr. **Larry Attai**. I think he's from Iran. He trained at that hospital in Montefiore under Dr. **George Robinson**, who was the Chief. And Dr. Robinson ended up having aortic valve surgery twice. I ran the pump on him twice, and **Larry Attai** did the surgery on him. So, we had a lot of challenges together.

Mark Kurusz: Sure.

Joseph Sistino: We had a lot of challenges together, and **Dr. Broadman** there, he was so supportive of me. So, he took me up to Boston Children's Hospital. I used to like to do field trips whenever I wasn't busy. Even though I worked at Long Island Jewish, I wasn't busy. We'd always go on field trips to other hospitals and try and learn. So, we took a field trip up to Boston Children's to learn how to do Norwood operations. We never were that successful with it, but it was early 1980s. So, nobody was really that successful with it.

Mark Kurusz: Even Dr. Norwood had his problems.

Joseph Sistino: Nobody was that successful, but he really tried. He and **Dr. Broadman**, he was an interesting surgeon. He's still alive, and I don't think he operates anymore. But his father was a general surgeon at the hospital. His mother was anesthesiologist at Montefiore. So, a lot of times they did cases together. So, he'd go like, "Mom, give the protamine." And his wife was the daughter of the Director of the hospital. I mean, he was all...

Mark Kurusz: Lot of in-breeding.

Joseph Sistino: ...Yeah. He was all connected in the hospital. He was a young guy. He was a resident there, and he went up to Boston Children's, and he went to the laboratory there where they have a couple of thousand specimens of hearts, every defect you can imagine. And there's just two professors there, the von Praaghs. And they wrote this book on cardiac surgery and pathology of cardiac surgery. And they maintained this collection, and they were there. And he introduced me to them, and I went down to see it and everything. And he was just so supportive, and we worked there.

Mark Kurusz: Sure.

Joseph Sistino: So, he was really good. So, all the surgeons at Montefiore were very...When I left there, they made a really nice party for me, when I left. So, I went to Columbia, and I got to work with a lot of great surgeons there. Dr. Craig Smith, who operated on Bill Clinton, he's there. Mehmet Oz, he was a resident there when I started, Dr. Oz. And who else was there? Robert **Michler**, who's now the Chief of Montefiore. He was there. That place was different

because those surgeons were very,very young, but they were 10 years ahead of their age in terms of their experience. I mean, [Dr.] Eric Rose, who was the Chief, he was 41 years-old when he became Chief. And everybody there, they didn't stay there long, most of them except for [Dr.] Craig Smith, but they were so far ahead. And they taught me how to do multiple research studies on the same animal. So, we would go to animal lab, and we'd do a study. We'd do five studies at the same time. They would be doing stuff in heart transplants. I would do something on low prime circuits. I mean, I never thought you could do that. But they showed me how to do multiple studies at the same time. So, there was a study on...they were developing a solution for transplant solution. That was a 24-hour solution. So, at the end of 24 hours every day, the heart that they would take out, they would transplant the next day. Then they would take that heart out and transplant it the next day. So, it was like every day it would be a transplant. So, we preserved it for 24 hours and then put it in and put the next one in. And so, the first time the heart came back after 24 hours, and oh, my God, everybody was hugging themselves, and they were hugging each other and jumping around a room. I never saw researchers react like that. They were just so excited. And then all of a sudden, about 10 minutes later, the heart fibrillates.

Mark Kurusz: That was it. End of experiment.

Joseph Sistino: So, the solution wasn't perfect, that was the end of that. But we also did the Lazarus experiment, which I call the Lazarus experiment. So...

Mark Kurusz: Lazarus?

Joseph Sistino: ...The Lazarus, like in the Bible.

Mark Kurusz: Raising the dead?

Joseph Sistino: Yeah. So, when they took the heart out of the patient for heart transplants, we'd take it back to the laboratory and started it up again on a Langendorf experiment.

Mark Kurusz: Sure.

Joseph Sistino: And then measure the effects of different drugs on the stroke volume. Some of these hearts had 400, 500 ccs of volume in each ventricle. They were huge hearts. So, one day we had a patient with, it was on a HeartMate, one of the early HeartMates. I was there for the first HeartMate at Columbia. And then the first one we did a right-heart assist on there, which was so much fun. The Abiomed had just come in, and I didn't even read the book on it. I watched the video on Abiomed the night before, and I came in and they said, "We're having problems with the right side after we put this HeartMate in." I said, "Well, we could put the Abiomed in." So, it was easy to prime it. I watched the video so I could prime it, and we hooked it up. And just as we were about to turn it on, there was no power in the Abiomed. It was just dead. So, I was with this cardiologist, he said, "Let's open it up and see if there's a fuse inside."

And we took it apart, and inside we found a fuse, and we replaced the fuse, and put the patient on the Abiomed, and the patient survived.

Mark Kurusz: Unbelievable. So, in the meantime...

Joseph Sistino: That was a little scary.

Mark Kurusz: ...you were using the foot pump?

Joseph Sistino: No, we actually didn't go on. We were ready to go on. The surgeon said he's almost ready to go on. He's like, "Whose cannulating?" And we're like, "We were almost ready to go on." And, all of a sudden there was no power to the device. But we got it going again, and that patient did well. So, for what I remember, that was the first one, we published that first use of Abiomed with a HeartMate. But with the Lazarus experiment, we had a patient one day who we got the heart for it, and they called me up, I came in. And they said, "Joe, the patient's ejection fraction is 60%. I don't know if we should do this transplant." So, they went out to talk to the family and the family said, "No. No transplant." The heart was perfectly good. The donor heart was a good heart, but it was too late to send it anywhere else. So, that was our control in the Lazarus experiment. We had a normal heart, and then we had all these other hearts with cardiomyopathy.

Mark Kurusz: Sure.

Joseph Sistino: They're still doing a lot of work with that now. The cardiologist that's there, I think he publishes a paper once a week. I see papers all the time. **Daniel Burkoff**, he's an engineer and a cardiologist, and he publishes papers on heart failure.

Mark Kurusz: Sure. Well, to bring it up to the present, [does] any surgeon stand out at the Medical University of South Carolina, Joe?

Joseph Sistino: Well, I work mostly with the pediatric team, but **Dr. Ikonmidis**, who's the Chief there. Now, he's very active in the Heart Association and a number of thoracic surgery societies, and he was on my dissertation team. My dissertation team, everybody often in the dissertation they usually have three people on it. I had five. I had **Dr. Ikonmidis**, Chief of Surgery, **Dr. Bradley** is the Chief of Pediatric Surgery who I work with a lot. **Dr. Atz**, who's the Chief of Pediatric Cardiology. My mentor, who is a health services research investigator, **Dr. Kit Simpson**, and she's my mentor for the last couple of years. And then there was one other person from the PhD program, **Dr. Ellis**. So, I had five people on my team. So, all of those people, I picked them because they're all so great. There were people that really helped me and supported me.

Mark Kurusz: So, you didn't feel that the odds were stacked against you, you had some insight?

Joseph Sistino: No. They were helping me. But when I did my presentation from, some of them read it, and some of them didn't read it. So, when I did my presentation, they started to ask questions of things that they should have asked when I was writing the paper.

Mark Kurusz: Yes.

Joseph Sistino: I had one little statistical problem that I had to solve, but they always find something. So, I mean, they're all really good surgeons there. I mean, all the people that I worked with there were really good.

Mark Kurusz: So, you mentioned some surgeons that stand out. You mentioned Jeff Riley earlier, are there any other perfusionists that you...

Joseph Sistino: Richard Chan...

Mark Kurusz: ...and Richard Chan, of course.

Joseph Sistino: ...and I worked with a lot. I worked with Linda Mongero in New York. She had left. She was the Chief before I got there. And then she came back after I was working there a year, I think. She came back and she was my Assistant Chief, and then she became Chief when I left.

Mark Kurusz: And I know from visiting the Medical University of South Carolina, many years ago, you've got quite a faculty, but some of them have left the university. Do they still keep in touch. Do you have meetings where everybody comes together?

Joseph Sistino: Well, we have our annual conference, a devices conference every year. So, I started that 1999. The person that was director that year asked me to try and come up an idea for a continuing education conference. So, we have a lot of faculty and former alumni that will come to that meeting. So, we usually get 60 to 70 people a year. And, usually, 20 of them are alumni or faculty in the college. So, that's how we try and keep in touch with people. This year we did this thing called the team approach to cardiac surgery, which I'm going to do it again. And we used a Ted Talk format, and we had 17 presentations by cardiologists, surgeons, perfusionists and Ted Talks. And so, the idea is they come out, and they don't have a slide with a title on it. They just start telling a story and they draw you in to their story. And then they tell you about something that they implemented that improved the patient care. And then they'll, at the end, they'll tell you the outcome of it. And it was riveting. A 20-minute talk, so they're riveting. Everybody was fantastic last year. So, we'll do that again this year.

Mark Kurusz: Good.

Joseph Sistino: And we invite all the nurses from the hospital to come for free.

Mark Kurusz: Great.

Joseph Sistino: So, we had about 250 people attend last year.

Mark Kurusz: Sure.

Joseph Sistino: So, that's our meeting.

Mark Kurusz: While we're talking about technology, I'd like to shift gears again and ask you if you could comment on what you think were some of the major technological advances in your career?

Joseph Sistino: Well, let me just phrase it this way—I think we still have a long way to go. I don't think we've progressed as much as I thought we were going to. Because I was early interested in blood conservation, I've always been interested in miniaturizing the [cardiopulmonary] bypass. And I thought we would be a little bit further along than we are. I mean, the oxygenators have gotten smaller, membrane oxygenators have gotten a lot smaller, but the patient population has gotten a lot sicker. So, many of the patients that we did in the 1970s or 1980s, we could probably do almost all of them without blood, but now in the higher risk populations, we need to do it...In terms of centrifugal pumps, I think there are some benefits in that area and some of the control features and having shutoffs on the arterial line, so we don't pressurize the circuit. We could never do the neonates that we do today. Inline monitoring of blood gases is really important, so we can control blood gases efficiently. In terms of anticoagulation, I don't think we've progressed that much. I mean, look, I always talked to the students about the paper in 1978, that looks at the 400 ACT level, Doty's paper. I mean, Young, Doty, Kisker, I think it is 1978. But nobody's redone that study with coated tubings or anything. We're still using that number. There's still a lot of research that needs to be done. And the perfusion market has shrunk quite a bit. It's almost becoming a commodity in some ways. So, I think we've progressed. I think probably the future is going to be smaller circuits and probably more uniform circuits and less customization because the cost of medical devices is going to force it to go more uniform. So, that we're going to be...

Mark Kurusz: Sure.

Joseph Sistino: ...in 10 years from now, we're probably using more uniform circuits or standard circuits rather than so much customization.

Mark Kurusz: Certainly, that's been talked about for a long time. Do you consider your circuits mini-circuits at this point or not?

Joseph Sistino: Not really. We've cut down priming volumes. But, for instance, for neonates, a neonate might have a priming volume of 250 [ccs]. We're still in the 250 range for priming volume. So, we're still equal to the patient's blood volume. We need to be below a hundred probably in order to avoid using blood.

Mark Kurusz: Sure.

Joseph Sistino: So, we're not there with small babies. We're not there, yet.

Mark Kurusz: Sure.

Joseph Sistino: So, I think the pump's going to have to be up on a surgical field at some point. That's the only way to do it.

Mark Kurusz: This is a bit of a loaded question, but what's your view, generally, of the cardiopulmonary industry? And you can cite experiences, or you can just answer in a general way.

Joseph Sistino: I don't know. I'm very favorable in terms of the support that they've given perfusion. There are a lot of meetings around the country. I understand they can't support every single one, there's a lot of expenses involved with that. But, I think they're very good in terms of their educational offerings. Some things we can't partake of it because of conflict-of-interest, but they do want to support perfusion through simulation, through product demonstrations, but they're facing a big challenges in healthcare reimbursement because of healthcare reimbursement, too. So, in terms of new technology, I think it's pretty slow. I think there's things that could be done to improve it. They respond to what the perfusionists want, to a certain extent, and to what that they see the market in the future. For instance, I'm glad they finally came up with a way to separate the cardiotomy return from the venous reservoir. They've been doing it in Europe for a while. They finally came to United States with it, and there's a lot of benefits to that. But, I don't really have that much interaction with the industry except at our conference where they come and do presentations, and they've always been supportive. And they do that without being too commercial and make it more of an educational experience.

Mark Kurusz: Okay. You talked about simulation earlier as being an interest of yours. Is there a perfusion simulator at your program?

Joseph Sistino: Yes, we have both—we have the Orpheus and the Califia. We have both. We have two rooms.

Mark Kurusz: Really?

Joseph Sistino: Yeah. And just this week they put \$50,000 worth of high-definition cameras and monitors in our simulation room. So, I think we have a really good facility. Simulation is a challenge for faculty because it takes so much time. So, as a program grows, it's hours and hours of time in simulation. So, with the Califia, we let the students use that on their own. We train them on it, but we don't stay with them there all the time. A lot of times we'll have labs with three students, and one student will run the pump, one student will run the simulator, and the other student would be an assistant, and they'll rotate or two people in there. So, once we go through the lab with them, they go back in there, they can practice as much as they want. And then we test them. With the Orpheus, because it's older and has become much more

fragile, we don't let students in there on their own. But that is in our mock OR. I mean, we have hanging lights. We have a table, and we inherited this room that was set up for OR training was completely equipped an OR. So, when you go in there, it looks like an OR. We have a camera and the light just like an OR.

Mark Kurusz: So, is that simulation room or simulator room exclusively for the perfusion program?

Joseph Sistino: Yes, it is.

Mark Kurusz: Well, that's a real benefit, isn't it?

Joseph Sistino: Yeah. They have a simulation center on campus for the rest of the university, and they used to be in this room. So, when they left to build their SIM center, they left that room, and they were going to dismantle the room. So, there's about \$700,000 worth of OR equipment in that room.

Mark Kurusz: Wow.

Joseph Sistino: They were going to dismantle it. And, fortunately, the Dean agreed to give it to me. And that year brought us the Orpheus simulator. And we also have a thing called "SIM Capture", which videotapes the student and can take up to four different cameras. So, we have two angles on the student. We have a direct feed of the OR hemodynamic monitor and a direct feed of the blood gas monitor on the Orpheus. So, the student can actually access that from home, and they can watch their simulation. And it also has evaluation forms attached to it, and as the students do certain tasks, you just check it off. And so, when they take their finals, we have a master checklist. And as the students are doing what they're supposed to do, they're in a procedure, we check them off whether it's changing an oxygenator or responding to a power failure. So, we check that off, and then it automatically calculates their grade. And we can also annotate the video. So, forgot to put the clamp on the arterial line, you can annotate the video so you can go right back to that spot and see where it is. And that's all saved. And that's part of the SIM center on campus. So that goes to their server. So, it's all protected. Nobody's carrying around videos of students or anything. But if the student wants to, they can log on and see their...

Mark Kurusz: Sure. So, I assume before a student in your program goes clinical, even with direct supervision, they are run through the simulation room.

Joseph Sistino: Right. So, what we do is, the first semester we use the simulation room to teach basic skills like how to balance transducers, hemodynamic monitoring, adjust occlusions, prime the circuits, those kinds of things. So, we don't really need a simulator for that kind of stuff, but the equipment's in that room, so we use it. Second semester, we teach skills. We'd break down into bypass and skills. So, we do on and off bypass. We do RAP, vacuum assist, and so, cardioplegia delivery, that's main. So, by the end of the second semester, the students have all

those skills down. They can go on off bypass, give cardioplegia, do RAP, vacuum assist. And then the third semester, we actually do cases in there where the student comes in, and it's just like a real case beginning to end. And we have the monitors, we can actually put an operative procedure on the monitors so we can coordinate that with the...say, give cardioplegia. You can see the cross clamp go on, and they give cardioplegia, and they say, "The only thing that's not realistic is there's not blood on the circuit." That's the only thing.

Mark Kurusz: Well, I thought you were going to say the only realistic thing...

Joseph Sestino: Don't have blood. The patient? The patient's pretty realistic.

Mark Kurusz: ...No. Surgeon screaming.

Joseph Sestino: Yeah. Well, we do a lot of videos in there.

Mark Kurusz: I know you do. You've done some...

Joseph Sestino: Yeah, we do.

Mark Kurusz: ...good instructor, bad instructor.

Joseph Sestino: No, but we also do videos where all the students play roles. They played a role as anesthesiologist. They played a role as a student, of the surgeon, of the nurse, and we've done videos on poor venous return, oxygenated failure, cardioplegia problems, water-to-blood leak—that's the funniest one because the perfusionist is telling the surgeon he has too much venous return. The surgeon's like, he can't handle it. He throws down his instruments, he goes, "What do you mean too much venous return? Perfusionists never complain too much venous return." And then you see a little cutaway of him pouring like this gallon jug into the heater-cooler every couple minutes. And that's really a funny one. But we've done a whole bunch of them, and we're going to put them all on AmSECT University soon.

Mark Kurusz: Good.

Joseph Sestino: That's our plan. We're going to get them all up there. So, we actually did an air embolism one with retrograde cerebral perfusion. And so, we actually edited an animal lab to it. So, you actually see us do reverse perfusion, air coming out of ascending aorta, everything.

Mark Kurusz: Amazing.

Joseph Sestino: But it is done in the SIM lab. It was done in the video, the interactions, the discussion between the perfusionists, everything is done in the SIM lab. But then we edited in the heart and the...

Mark Kurusz: Sure.

Joseph Sistino: ...air and everything. And you see the air going through the arterial filter up to the arterial line. And then the perfusionist is distracted by the anesthesiologist because the anesthesiologist shows her something on an iPad—“Angry Birds” game. They start playing “Angry Birds” in the middle of [cardiopulmonary] bypass. And so, the next thing you know, air is going up into the patient. And so, the surgeon says, “What do you mean there is air in there? You know what to do? Did you practice this?” And it goes through the whole thing, and they’re all fumbling trying to figure out what to do and everything. And I don’t think anybody’s ever done that, recreated an air embolism. So...

Mark Kurusz: I don't think they have.

Joseph Sistino: I really believe that if students get exposed to those things, and talk about it, and even acting in the video—participating that if it ever happens to them, I think they’ll be able to manage it a lot better.

Mark Kurusz: Well, that actually anticipated my next question. Obviously, a lot of work went into creating these scenarios, a lot of frontend creation. What sort of feedback have you gotten from students who have spent time in the simulator?

Joseph Sistino: They can’t get enough. That’s the problem.

Mark Kurusz: Really?

Joseph Sistino: They can’t get enough. That’s all they want to do is simulation. They want to do as much as possible. They can never get enough. But the thing is, we have a limited amount of time that we can spend with them.

Mark Kurusz: Sure.

Joseph Sistino: So, it’s usually it’s one-on-one. So, that’s why we developed a second room for simulation, where they can go and practice on their own and then come in and have us test them. So, I think that’s been a big help, especially as our program has expanded in size.

Mark Kurusz: Sure. I’d like to ask you now, Joe, if there are any cases that stand out in your mind...

Joseph Sistino: Oh, okay.

Mark Kurusz: ...good or bad, as just really memorable cases?

Joseph Sistino: Yeah. I’ll talk about the good ones, the bad ones I don’t want to even think about anymore.

Mark Kurusz: Sure.

Joseph Sistino: They were mostly early on. But I had a really good one that we wrote up and published. It was a patient that had driven down from New Jersey to Myrtle Beach, and he went to play golf, and in about a day after playing golf, he developed really bad shortness of breath, and they diagnosed that he had a pulmonary embolism. So, they contacted us, asked us if they can bring him down to MUSC. So, we didn't have an adult ECMO program at the time. We had a pediatric ECMO, but no adult program. So, we put together a circuit with a Biopump and an oxygenator, and we hopped on the helicopter. And I went with one of the surgeons, and we went up there, and we put the patient on bypass in the hospital. Meanwhile, the ambulance was driving up from Charleston. So, by the time we got there and got cannulated, the patient was on bypass. We put him the ambulance, and we drove back to MUSC, and then the surgeon did a good thing. He decided to operate in the morning, not to operate that night because we were all up all day, and we were all pretty exhausted from the whole transport thing. So, the patient was stable. So, we went home, couple hours, and came back in the morning. And this was an amazing case because as soon as we went on [cardiopulmonary] bypass, I saw that the venous saturation was almost a hundred percent. So, the patient had an ASD, and I told the surgeon, I said, "I think this patient has an ASD." So, it turned out that, because on his right-sided pressure was so high, that blood was flowing across his ASD. And, soon as we went on bypass, we were getting oxygenated blood into the venous line—it had reversed. So, that was interesting. And then the resident came up with this idea. He said, "Look at this paper." And I don't remember what paper it was, or where he found out about it. But, he came, he said, "Look at this thing where you do retrograde pulmonary perfusion." So, I mean, it was an on-the-spot thing. This patient had an ASD. So, the surgeon decided to take cardioplegia cannula and stick it across the ASD into each of the pulmonary veins. And we perfused the lungs backwards until we got all the clot out of the pulmonary arteries. And I have pictures of all the clots and everything. And so, we just perfused for a very short time, just enough to clear out the clots. And I don't remember what the pressures or flows were right now, and then came off bypass, and the guy went home in a couple of days. He was perfectly fine.

Mark Kurusz: Amazing.

Joseph Sistino: Totally recovered. So, of course, I had to go back into the literature and look this up. And there were all these papers written in 1965 about pulmonary perfusion that they had retrograde pulmonary perfusion for pulmonary embolism. And they did these dog studies and they looked at pressures, flow, and time. And they showed that if you have over a certain pressure for a certain period of time that you develop pulmonary edema, but if you could do it for short enough time at low enough pressures that the dogs and lungs were not damaged. And so, we were fortunate in doing that. So, we published that, and that's been cited quite a few times, that paper.

Mark Kurusz: I bet it has.

Joseph Sistino: Because I belong to the ResearchGate...You guys do that, right?

Mark Kurusz: Yes.

Joseph Sistino: So, you see every time you get something get cited, that paper's been cited a lot. So, I thought that was really cool. I said, "Why didn't anybody have to think of that before?"

Mark Kurusz: Sure.

Joseph Sistino: I mean, when you do pulmonary embolectomy watching them trying to pull clots out of the pulmonary arteries, you know things are breaking off. You're not getting into the arterioles or anything. So, it makes so much more sense to do retrograde. So, that was a great case.

Mark Kurusz: Sure.

Joseph Sistino: So, it turned out that Jim Dearing had done a case 20 years before, a similar one. Not with retrograde perfusion, but put a patient on ECMO and brought the patient to...so, we presented it at the M&M conference, and we were all excited, and one of the surgeons said, "Oh, that's no big deal. We did that 20 years ago." So, anyway, but we published it anyway. We published it.

Mark Kurusz: Well, obviously you still enjoy doing perfusion. What aspect of perfusion do you enjoy the most, Joe?

Joseph Sistino: I do mostly pediatrics now.

Mark Kurusz: Oh, you do?

Joseph Sistino: Yeah, I do. It's all I do is pediatrics now because I'm only doing 40 cases a year. I can't really maintain competency in every area. I don't really want to go into the operating room and not feel like I know exactly what I'm doing. And with the pediatric team, I try to be, remain engaged with them. I go to all their meetings, all their conferences with the surgeons, and participate as much as possible. So, I really like doing the pediatric cases, not some of the long redos so much anymore. But the straightforward cases, especially like a switch. I love doing the arterial switch. When I was at Columbia, the surgeon there was a master at arterial switch, but I never really got to watch the details of it. But, now we have a 60-inch monitor in the OR, about 10 feet away from the pump. So, you can see every detail, every stitch of every operation. And it's just fascinating. I love that. So arterial switch, Norwood, interrupted arch, all the neonate stuff, I love that. To me, that's the most fascinating.

Mark Kurusz: I'm going to ask you briefly about teamwork. This interview is going a bit longer, but I want to cover all the areas. What can you say about teamwork? How important it is, maybe your approach to teamwork at your center.

Joseph Sistino: Okay. In the pediatric side where I work, now we have it's called a Room Two Crew, because we work in Room Two primarily, and so we meet once a month. Well, I would say there's some other places where I felt very comfortable, but there everybody on the team is

very outspoken, if they feel anything that needs to be improved. Nobody will ever hesitate to say, speak up, and they feel very comfortable. An anesthesiologist that runs that has set the tone for that. And we have social events together. And so, we do a really good timeout in the beginning of surgery. Everybody really participates in that. And I can't tell you how many times I've caught something, or the nurses caught something, or the anesthesia's caught something that somebody missed that was really important. One day they're given the wrong dose of antibiotic, and I knew I was given a dose into the pump, so it should have matched mine. And when the anesthesiologist said the dose, it was about three or four times what the dose was supposed to be for the patient. And so that's happened with numerous other things and during the timeout. And there were days if you even talked to the surgeon before the surgery, they would snap at you. They're like, "You don't know what you're doing, why are you asking me that question?" Right? But, today it's completely different.

Mark Kurusz: Sure.

Joseph Sistino: It's like, you have to speak up. And so, that's the biggest change in teamwork. That's the biggest difference than the past.

Mark Kurusz: Sure. What do you think are the personal attributes that make for a good perfusionist, Joe?

Joseph Sistino: I think somebody that needs to...one thing, is not give up. Just you know that there are certain cases that are going to go much longer than you expect, and just stay focused and worry about finishing that case, and then you deal with whatever else you have to deal with. Stay focused. In terms of skills, I think it's somebody that's open to new ideas and somebody that's scientific in terms of their interpreting practice and not just make a decision based on one case, but look at the literature. And then plan ahead to what you're going to do.

Mark Kurusz: You're alluding to evidence-based perfusion?

Joseph Sistino: Yeah. I mean sometimes there's no evidence with some of the things we do that it's pretty hard to find. And I really feel that as much as people want to be independent, that too much variation is not good. Now we should come to some consensus on how we're going to do it. We just went through it recently with something with our team, and we all talked. And we figured out we were all doing something slightly different, and we all said, "Okay, we have to figure out we're going to all do this exactly the same way." Because we're changing something else, and we can have all these other variables going on. And everybody's really good about discussing it and coming to a consensus, how we're going to do it to try and reduce that variation. So, if you are not the type of person that's willing to give up your independence, then you're not going to be a good team player. So, that's what I look for in a perfusionist. And I don't know, I've had a lot of good people that I've work with and trained. Enthusiasm is very important. I want somebody who's enthusiastic at work. I don't want somebody that's looking to leave.

Mark Kurusz: Well, this may be a difficult question, but what does it mean to you to have been a perfusionist, Joe?

Joseph Sistino: To be a perfusionist?

Mark Kurusz: Yeah.

Joseph Sistino: I mean, it's given me a lot of opportunities that I never thought I would have.

Mark Kurusz: What sort of opportunities?

Joseph Sistino: Well, because it's a small profession. I think the ability to participate at a very high level may not exist in other societies. It's not really a competition, it's everybody working together to try and improve their profession. So, I think that's one aspect of it that I really like that it's a small group. You get to know people on a personal, professional level, and also most perfusionists are adrenaline junkies. So, that's what we get to do. We enjoy that part of it.

Mark Kurusz: Sure. So, you'd say that there were a lot of personal satisfactions being a perfusionist for all these years?

Joseph Sistino: Yeah. I'm not always satisfied. I'm always looking to the next thing or to grow. I want to continue to grow, but as my career is towards the end almost, at this point, I have different objectives than I did five years ago when I was trying to finish the PhD program. Now I'm trying to move the program to a Master's degree level, and I want the program to be really strong. We need good perfusion schools. We need high quality perfusion schools. And I'd like to see a uniform degree for all the perfusion schools. So, those are the things that I would like to work on in the next couple of years.

Mark Kurusz: Sure.

Joseph Sistino: That would make me satisfied that I contribute something to the profession.

Mark Kurusz: Well, let's bring that back to AmSECT, in particular, and how important AmSECT has been in your career and in your feelings of personal satisfaction?

Joseph Sistino: Well, I mean, the first meeting I went to was in 1976 in Chicago. I've been to quite a few AmSECT meetings. I missed the 50th one, two years ago because I had to work...the 50th anniversary. But AmSECT has provided a lot of opportunity for both me and my students to present, great learning experiences, ability to interact with a lot of perfusionists. Also, people that I can use their institutions to teaching, for clinical instruction for our students. So, if I come to AmSECT, I see perfusionists from all over the country where our students are. And I see the students interacting with perfusionists for the first time at their first meeting. So, there's a lot of opportunity at a meeting like that, a national meeting that you don't have when you're isolated in your own institution.

Mark Kurusz: Sure. Well, do you have any closing thoughts on what you'd like to say to the new generation of perfusionists, Joe? I know we've covered quite a bit today in this interview, but any words of wisdom?

Joseph Sistino: Yeah. My major thrust would be to continue education as much as possible. Learn about statistics so you can understand how to do quality improvement. Hopefully, some of the skills that you learned in school, even if you don't use them now, you'll use them 10 years from now to improve your practice. And do the things that you like to do in perfusion. So, if there's certain areas that you really enjoy doing, whether it's platelet gel, blood conservation, looking at outcomes after myocardial protection, reducing blood volumes in pediatrics, long-term outcomes, whatever area you're interested in that you get those skills. So, you can do a really good job with that, and that when you do eventually present information then it's really valid, and that people can use it to help. You can help other people with that information and publish.

Mark Kurusz: Well, very good. I really have enjoyed our conversation this afternoon. And I want to thank you again for all your contributions over the years. You've got how many students are out there that have graduated under your tenure?

Joseph Sistino: Well, I mean, I started as a clinical instructor. When I first started, I was a clinical instructor. I've always been a clinical instructor, so I can't even count those. But since MUSC, probably 200 from MUSC.

Mark Kurusz: It's pretty impressive.

Joseph Sistino: But before that, I always had students. Even when we were in Columbia, we were affiliated with four clinical programs.

Mark Kurusz: Sure.

Joseph Sistino: So, it's a lot of people that...and those people have trained other people. So, it goes on and on. So that's...

Mark Kurusz: Exponential.

Joseph Sistino: ...Yeah, it is, definitely.

Mark Kurusz: Well, Joe, thank you very much.

Joseph Sistino: Thank you.

Mark Kurusz: Thanks for taking time.

Joseph Sistino: Sure. My pleasure.