Pioneer Perfusionist Interview: Mark Kurusz

Dave Fitzgerald: My name is Dave Fitzgerald, and I'm here with Mark Kurusz, one of AmSECT's pioneers in perfusion, and we're both here together at AmSECT's 53rd annual International Conference in Tampa, Florida. Today's date is April 16th, 2015. Mark, you've had a very illustrious career in perfusion. And the first question I have to ask is what were the circumstances that led you to become a perfusionist?

Mark Kurusz: Well, like many perfusionists and, quite frankly, we were called "pump techs" back then, I got into the field really by being at the right place at the right time, Dave. I was an orderly for really only about two or three months at the Hershey Medical Center, which had just opened the year before in 1971. It was really the only job I could take because I had no other hospital experience other than being a phlebotomist and a diener. Now, diener is not a common word in the dictionary, but if you really go to the Oxford English dictionary, a diener is an assistant to the pathologist during autopsies. So, I was a diener and phlebotomist part-time during college in a small hospital in New Jersey. After about three months in the job as an orderly, and my only contact with the heart patients at that time was to shave them the night before, chin to toes. I distinctly remember that because they used femoral artery cannulation, and I had to be very, very careful when shaving in the groin area. But that was my only contact with the heart patients at that time. There were two perfusionists at Hershey at that time, Dennis Williams, who was the Chief, and he had another fella, who will remain unnamed, but he had a terrible habit of playing the drums with his tubing clamps on the heart-lung machine, which as you know, was made out of stainless steel. And this really annoyed the surgeons. So, he made another error during one case where he tossed an empty glass bottle over the operative field into the waste basket on the other side of the operating room. And after that incident, he was asked to leave. So, Dennis approached me and said, "Would you like to train on the job as a pump tech?" And much to Dennis's dismay, I said, "Well, let me think about it. Let me talk with my wife." And the next day I said, "Yes, I will do that." So, I began really a one-on-one situation. Dennis had never trained anybody on-the-job. He had been trained on-the-job in New York City several years earlier. And we really began a preceptor-type situation. So, that's how I got into perfusion. On paper, the training period was really supposed to be two years. But the reality was within a few months, I was doing cases independently, and that's really how I got into it, David.

Dave Fitzgerald: Well, I think I can speak for most of us in the community, we're very thankful that you never made a career out of becoming a diener or a phlebotomist, and a lot of us are very thankful with your contributions to the profession. Tell us a little bit about where did you work and what were your responsibilities in perfusion?

Mark Kurusz: Sure. Well, in the early days there were three surgeons, and we really were responsible for all the cardiopulmonary bypass cases, but Hershey had a very active dog lab. And one of the projects that Dr. William Pierce was working on was cardiac assist. So, we would go down to the dog lab and pump animals for implantation of the sack-type VAD and other

experiments with dogs. So, that really was the only other duties we had. Maybe two years after starting at Hershey, the intra-aortic balloon pump came out. And we were, of course, asked to manage that, at least in the operating room. There was really not a lot of inservice from the company. As you know, the balloon pumps didn't have a lot of fancy controls. It was just really setting the inflation and the deflation, and more importantly, getting a good ECG signal. So, balloon pumps, cardiopulmonary bypass, animal labs were the primary duties. I have to say that one of the advantages of being in a university setting as opposed to a private practice setting as you've experienced, is that we weren't constantly doing cases. So, during my free time, we had an excellent medical library. I was able to go to the library at Hershey and read up on primarily blood-foreign surface interactions and really became interested in that aspect of extracorporeal circulation.

Dave Fitzgerald: Wow. How many years did you practice perfusion?

Mark Kurusz: Well, unfortunately I was hoping to practice for 40 [years], but in reality, I practiced for 38. In 2010, I developed bacterial meningitis, and it knocked out the hearing in one of my ears, and it just became too difficult to hear the communications in the operating room. I reluctantly hung up the tubing clamp in the fall of 2010.

Dave Fitzgerald: Wow, what a career. Tell us a little bit about some of the surgeons in hospitals that you worked with. Were there any surgeons in particular who stand out as impacting your career?

Mark Kurusz: Well, I'm glad you asked that because, yes, at Hershey, there were three surgeons. One whom I would qualify as an old guard, Dr. John Waldhausen, who was a fine, fine man. And he really was recruited from Philadelphia Children's to head up the cardiac surgery program, actually the whole Department of Surgery at Hershey, when Hershey opened. And he recruited two young surgeons, Dr. Frank Tyers and Dr. William Pierce. The three of them were very influential in my career. First, of all, to Dr. Waldhausen for allowing Dennis to train me on-the-job. And secondly, to Dr. Pierce, who helped me in some research work. We basically exchanged...I'm going to digress here a bit with Dr. Pierce. But, basically, Hershey Medical Center got a scanning electron microscope in the early 1970s. And there was an article in the newsletter of the medical center that the Department of Anatomy had this scanning electron microscope, and that it was really to be used by anybody at the university. So, I approached the Chairman of the Anatomy Department, and I said, "Boy, I'd really like to look at some surfaces that we use in the OR every day." And he welcomed me in, and I learned how to use the scanning electron microscope. And then Dr. Pierce found out that I had been looking at blood surfaces and said, "Boy, we've been struggling with developing a very smooth segmented polyurethane ventricle for long term assist. I'll tell you what. I'll pay for your time on the scope in exchange for you looking at some of the ventricular assist surfaces." So, it really worked out very well. And I looked at a lot of surfaces that were used both pre- and post-implant in calves for Dr. Pierce. And then did my own, what I would call independent research, looking at blood surfaces in the heart-lung machine. In fact, the first paper I ever gave was at AmSECT in Portland, in 1975. And that paper won the best paper of the meeting. And I said, "Gee, this gig

may work out." So, the third surgeon who I certainly want to acknowledge is Dr. Frank Tyers. And Frank was a superb person, is a superb person, very inclusive of the perfusionists. He would put us on papers as a co-authors. His major interest was cardioplegia. We began using crystalloid cardioplegia in 1974. A lot of work came out of his lab, looking at the Langendorff isolated heart preparation, as he tried various solutions. But Frank was a real champion of the perfusionists. When Frank was recruited to the University of Texas Medical Branch, I was invited to join him. That collaboration continued on for another two years until he relocated back to Vancouver, Canada. So, I have to say, all three of the early surgeons were very important in my career. In Galveston, I need to also mention Dr. Vincent Conti, who was a Kirklin-trained surgeon, came to Galveston in 1979. I worked with Dr. Conti for 25-plus years, and we collaborated on book chapters, other papers, and really had a very good working relationship.

Dave Fitzgerald: I'm willing to bet that you made perfusion champions out of all those surgeons and not the reverse.

Mark Kurusz: Well, it's hard to say. They all had their own research interests. It was a great time to be a perfusionist, Dave. There was a lot going on, as you know. The coronary artery bypass operation was in the ascendancy. But, along with that, refinement of cardioplegia, development of LVADs, and then ECMO certainly, was an important aspect. We did our first ECMO case in 1975, and we used Landé Edwards. It was a little four-year-old boy who had pneumonia. Maybe I'll talk a little bit more about that case later, but we were doing ECMO very early. And, certainly, when I went to Galveston, we got a very active ECMO program in the mid-1980s.

Dave Fitzgerald: Very interesting. So, you're a pioneer in this industry, an expert of 38 years of perfusion service. In your opinion, what were the most notable perfusion practice changes or innovations that occurred during your practice as a perfusionist?

Mark Kurusz: Well, without a doubt, I'd have to say cardioplegia revolutionized [cardiac] surgery. I'm sorry to say that in the early days at Hershey, after either ischemic arrest or electrical fibrillation, surgery was done, and the patients could not be weaned from the heart-lung machine. And they would try all kinds of drug therapy. The balloon pump was not available. There were many cases, not too many, but there were times when after hours and hours and hours of trying to wean the patient from the pump, the surgeon would look over and simply say, "Turn off the pump." And that certainly sticks in my mind, to watch the monitor as the patient's blood pressure dwindled away. Of course, that all changed with cardioplegia because with adequate myocardial protection, as cardioplegia provided, we were able to cross clamp for two hours, two-and-a-half hours. Frank Tyers had a funny saying. He said, "Cardioplegia is like flipping off the light switch and then flipping on the light switch." And it really was that way. So, cardioplegia certainly stands out. I think that from a perfusionist's standpoint, David, we've been the recipients of real innovations that were driven by manufacturers. I think that for a long time, even though the membrane oxygenator was theoretically superior to the bubble oxygenator, the transition really didn't occur till the mid-

1980s. And then the rest of the world swung over to membranes as they became really easier to use. Some of the early membranes were not really user-friendly. We did at least 150 cases with the original Travenol TMO, which was a fairly complicated setup because it required two pumps [and a] recirculation shunt. We actually did a study comparing patient outcomes and lab values in TMO membrane-supported patients with the bubble oxygenator [patients] and could demonstrate no difference in how they did. So, really it wasn't, I think, until about the mid-1980s, when the CML from COBE came out that really looked and performed a lot like a bubble oxygenator, that we finally embraced membranes.

Dave Fitzgerald: So, you're describing a real evolution in perfusion over the course of your career, differences obviously in cardioplegia techniques, and the components, and the protocols. And you were all a part of that. You were a pioneer in many regards for that maturity within our industry. Tell me a little about what your current view is of the cardiopulmonary industry, in general. Is it favorable? Is it unfavorable? Maybe compare it to parts of your career during a similar time?

Mark Kurusz: Well, that's somewhat of a loaded question, and I'll answer it this way. That in the heyday, what I would call the golden years, the 1970s, and even the 1980s, the sky was the limit. And the companies' budgets to develop cardiopulmonary devices, do R&D, was almost unlimited. We saw a lot of innovations. Now, I have to say that some of these innovations sometimes resulted in devices that either leaked or just didn't work. It was almost axiomatic that if a perfusionist had a problem with a device and then would send the device back to the company, the company would then report back that there was absolutely nothing wrong with the device, when clearly something was wrong with it. So, that was a bit of a negative experience with the cardiopulmonary industry, but that was really a minor occurrence. I don't want to characterize my view of the cardiopulmonary industry as necessarily negative. I think to their credit, they certainly were pushing the boundaries with newer devices. A clear example is in the old days, there were very few pediatric devices. The word on the street, so to speak, was that, "Well, that's such a small market. It's not financially viable for us as a company to put a lot of R&D into pediatric devices." Well, that, of course, has changed tremendously. Certainly, in the last decade, there's a wide variety of pediatric perfusion devices. Everything's been miniaturized. So, I really want to credit the cardiopulmonary industry for forcing us, in a way, to become more progressive. I think that they would have focus groups and seminars, and they'd pick our brains and then go back to the lab and come out with new products. So, that was a positive development.

Dave Fitzgerald: So, you told me a little bit about the surgeons that you've worked for and how you've been able to build lasting relationships with them, and even Dennis [Williams], and bringing you up and training you on-the-job to become a perfusionist. Over the course of your career, can you tell us if you were involved in mentoring or training beginning perfusionists and maybe elaborate on some of those experiences?

Mark Kurusz: Yes. I'm proud to say that in 1977, when I was recruited to Galveston, I was approved to hire a second perfusionist. At that time, you could still train somebody on-the-job.

The 1981 deadline that mandated perfusionists who were to become certified, had to be graduates of an accredited training program. So, in fact, I recruited to Galveston a technician from the Department of Anatomy at Hershey, and I taught him on-the-job. The only book, the only syllabus we used was Galletti and Brecher's "Heart-Lung Bypass." We would spend one week, in a one- or two-hour session, going through each chapter page by page. Even though the book was dated, having been published in 1962, there's a lot of wisdom in the original Galletti and Brecher book. So, I would underline and highlight. He had his book, and we'd say, "Okay, this is what the situation was in 1962, but now here's the reality." So really the Galletti and Brecher book became the syllabus to teach Earle Christman, who is still practicing in the Virginia area to become qualified and ultimately certified as a perfusionist. So, that was the only mentoring experience I had, David.

Dave Fitzgerald: Wow. That's a fantastic one at that. So, the thousands of cases of patients that you've worked on, performed cardiopulmonary bypass, are there any ones in particular that you're willing to share that were memorable, either good or bad?

Mark Kurusz: Yes. There are a few. As one of the previous interviewees said, you tend to remember the bad outcome cases. And I'll tell you about one or two. Certainly, when I was training Earle on-the-job, and he was well into his mentorship, preceptorship, and was running a case. I was always very close. I was in the pump room, which was about ten feet away. The surgeon, there was a great commotion, and they said, "Oh, we've got a problem with the pump." And what had happened is the pump spontaneously accelerated and emptied the reservoir in the bubble oxygenator, drew air into the arterial line. We were using a Sarns torpedo. We did use arterial filters. We were well ahead of the crowd in Texas at that time. We did have arterial filters, but essentially there was air all the way from the arterial reservoir up to the arterial filter. Earle did shut down the pump. And really, they were at a point where the surgeon says, "What do we do?" And I said, "There's no way we're going to clear this. You need to clamp the arterial line, clamp the venous line, disconnect the arterial and venous line from the pump, plug them together, and well recirculate. And we should be able to get back on bypass quickly." And that's exactly what happened. I think we were off bypass for two or three minutes. Somewhat comical to think about it now, but there was an anesthesiologist standing by the pump, pumping all kinds of drugs into the reservoir, probably brain protection drugs. But anyway, we were able to get back on bypass and the patient recovered without incident.

Dave Fitzgerald: Wow.

Mark Kurusz: But it was very, very scary. I have to tell you that it really, really shook-up Earle. He physically got sick. Didn't want to come back to the OR. But we said, "No, you need to come back and do cases." And we recovered from that. So, the afterthought on that case was, "I want to forget this. This is nightmare material." Well, when Dr. Tyers heard about it, he said, "No, we need to write this up. You need to alert the profession." And we submitted the article to the "Journal of Thoracic and Cardiovascular Surgery." [Dr.] Dwight Magoon was the editor. And much to my amazement, and probably much to Dr. Tyer's amazement, they accepted it with only one change. And that was, I had misspelled the word gauge on the figure, and they

corrected that, but published it. And that certainly put Galveston on the map. People said, “A runaway pumphead?” And subsequently people also said, “Well, yeah, I had one of those, but we never wrote it up.” So, that was a memorable case. There were others I’ll share with you, again, not naming names, but we were doing a pediatric case in Galveston in the late 1970s. This little four-year-old boy was bleeding, bleeding, bleeding, bleeding, and the cardiac surgeon, who was an excellent surgeon, finally looked up from the field after about an hour and said, “Is anybody in the room O positive?” And the anesthesiologist says, “Yeah, I am.” And I said, “Well, I used to be a phlebotomist.” The anesthesiologist sat down on a stainless steel stool. I drew a unit of blood off of him. They hung the blood, gave it to the kid, and all the bleeding stopped. Now, to do that today, you’d probably end up on the front page of some tabloid. That would be totally unacceptable today. But dire circumstances force you to do dire things, and in that case, it worked. So, that case stands out. There have been some ECMO cases over the years, Dave, that we had a saying in Galveston that we will not stop ECMO until the wheels fall off. And Dr. Zwischenberger, who trained under Dr. Bartlett in Ann Arbor, was the head of the ECMO program. And at that time, quite frankly, we were the fourteenth ECMO program in the ELSO organization. There was a real feeling that if you did ECMO for 14 days, that was the cutoff. If the patient didn’t get better, you stopped ECMO. Well, Dr. Zwischenberger always thought we should always go as long as we possibly could. And we had some remarkable recoveries. I mean, I think our longest case was approaching 1,400 hours. Adults. We did adults. And I just remember blood...I mean, we depleted the blood bank and that patient survived. So, some of the ECMO cases really stand out. The other thing that Dr. Zwischenberger did every year, again, patterned after the Ann Arbor experience, is he’d have a picnic. And the parents were invited to the picnic, and we would be able to see these little children post-ECMO. And the only thing that would indicate that they had been on ECMO was a little scar in the neck. It was just very gratifying for the whole team, nurse team, perfusion team, surgeons, ICU nurses, et cetera. Well, I have to say I’m dating myself, but I went to an ECMO picnic just a few years ago and a mother and her child showed up. I said, “Well, obviously here's a little ECMO baby.” No, it was the mother who we had treated 18 years earlier, who was now married and had a child and was just doing fine. So, it was very gratifying to see that sort of thing.

Dave Fitzgerald: Wow. That’s fantastic. So, you told me you were going to give me some negative stories. They were all positive stories. I mean, at least from the standpoint of the outcome. I think in hearing you in describing these stories, the one thing that really jumped out at me is teamwork. That in each of these adverse events that you had people working in teams, whether it’s an anesthesiologist donating his own blood or in the case of ECMO, obviously it is a team effort. So, I guess this is a loaded question for you, Mark, but tell me a little bit about what do you think the teamwork aspects are of open-heart surgery? Why is it so critical?

Mark Kurusz: Well, I will admit that I was not the best Chief Perfusionist. I was not skilled at managing people. When the team was just myself and another, it was very easy. But when we had four members, it became a bit of a problem because everybody had their own needs and wants. I was not particularly good at managing the team. I think that certainly the primary relationship I’ve always thought has been surgeon and perfusionist. They clearly worked

together very closely. That was certainly my experience. I think that on occasion I would have to recruit the anesthesiologist into the mix when we were on bypass, if the surgeon was preoccupied with the operation. So, really it became what we've written about as a team of teams. Anesthesiology, perfusion, surgical, and, of course, nursing. The nurses really didn't have the knowledge of what was involved with cardiopulmonary bypass, but were very helpful in getting cardioplegia. They were able to have some sense when we said, "We need this," and "I need it now," they would be very responsive. So, I think it's easy to say that the team aspects are very important. I never took any courses on team management. I never read any books on team management, but it's clearly very, very important. I think that later in Galveston, I think it may have been in vogue. There was this nursing initiative called shared responsibility, and basically things were sort of done by committee. That, quite frankly, was a bit of a disaster. We were forced under nursing for a short while. Again, it's the perfusion-nursing antagonism, and that may be too strong a word, has certainly existed. But somehow, we made it work. And I think interfacing with the ECMO nursing team, which again was patterned after the University of Michigan system, the perfusions did not sit ECMO shifts. We set up, primed, initiated, and then made rounds daily and did troubleshooting. Made life a little easier because we had a whole pool of ICU-trained nurses. We trained them ourselves, certified them within the institution to sit as ECMO Specialists, but...Don't want to beat a dead horse, but teamwork clearly is very important, David.

Dave Fitzgerald: Absolutely. But understanding how you're explaining that, you also think that there could be a point where you were mentioning about the shared responsibility, that it could be too much? That it may actually limit the autonomy of the perfusionist? Am I correct in asking that?

Mark Kurusz: Yeah, and I think I used the wrong term. I think it was called shared governance…

Dave Fitzgerald: Governance.

Mark Kurusz: …was what was promoted in the nursing profession, certainly, and they tried to apply it to the perfusion team. I think our fallback position, which was maintained, was always the cardiac surgeon. I mean, if the nurses got too overbearing or were just trying to implement something crazy, we'd go to the surgeon and say, "This just doesn't make sense." And he would always go to bat for us. In fact, one of the things I really owe to Dr. Conti is that he...We were stuck within the nursing scheme in terms of salaries, and he saw the need to increase our salaries above what skilled nurses might be earning. So, he got me a faculty appointment in 1981, and then that opened up the door. I got free parking in the faculty parking lot. I got my journals bound free. I mean, it was really terrific, but that was his solution to bypassing the nursing hierarchy.

Dave Fitzgerald: So, having said that, tell us what you think about what personal and professional attributes contribute most to a person becoming a good perfusionist?

Mark Kurusz: Well, I think one has to have empathy with the patient. We had a saying in Hershey that you treat every patient as if it was a family member. Knowing how invasive cardiac surgery is, and what these patients are going to go through, there was always a disconnect in my mind between what the patient was told during the informed consent part of their surgery and what really happened. I mean, I know for a fact that the surgeons didn't tell them, "Your chest is going to be split wide open. We may break a few ribs. And then there's this machine that's going to take over your heart and lung function." I don't think that level of detail was ever really communicated to the patients. Yet as a perfusionist, we saw day in, day out, patients laying down on the table and undergoing periods of hypotension, surprises when the diagnosis may not have been exactly what they expected. So, I think having empathy with the patient is very important. The corollary to that, of course, is having attention to detail and just being there 100%, not becoming distracted. One of the great things that Dr. Conti mandated, was we had a rule in the operating room that when the patient was on bypass, the plane was less than 10,000 feet. So, any conversation was only directed to the patient that was on the table. Now, once the aorta was unclamped or the patient was off bypass, there would be kibitzing about personal events and that sort of thing. We never played the radio in the operating room, but I thought that was a good plan. We were very early to adopt checklists, which again, came from the aviation industry. So, I may be digressing a bit from your initial question, David. I've lost track of what you asked me.

Dave Fitzgerald: Just about the professional and personal attributes that contribute to being a good perfusionist. You had mentioned empathy, certainly attention to detail.

Mark Kurusz: Well, and the third one, of course, is continuing education. Meetings such as this are very, very important because, as you well know, it's not a static field. There's new devices coming out every year, new ways of delivering cardioplegia. I think that the good perfusionist has to keep up with the field, either by reading, or attending meetings, or God-willing even presenting some of their experiences with a new device. That's very, very important. So those three things, I think, are very important.

Dave Fitzgerald: What does it mean for you personally to have been a perfusionist?

Mark Kurusz: Well, you weren't here for my Gibbon lecture yesterday, but I found a wonderful quotation from James Cagney, who was an actor. He basically said, "If there's a buck to be made, you go ahead and make it, and you don't ask any questions." That's really how I got into it. I think that it's obviously meant a great deal to me because I stuck with it as long as I did. There were times when I thought of maybe leaving one institution for another. But, overall it was a very gratifying field to be in. But, I have to tell you, now that I'm retired, I look back on being on call and going in, in the middle of the night, for transplants, and dealing with some of the technical issues. And you kind of scratch your head and say, "How did I ever do it?" I mean, I'm really in awe of the new perfusionists today because they're coming out with well grounded, tremendous experience at various hospitals. Whereas I was basically working at one institution. We did it one way and always did it the same way. So, it meant a great lot to me. I

was able to provide for the family. Certainly, there were times away from the family that were not as easily accepted, but that was the reality.

Dave Fitzgerald: Great. Okay. So, on the heels of that, what did you enjoy the most about perfusion? You had mentioned the commitment to perfusion and how you did it for so many years. Maybe tell us about personal satisfaction or rewards in your career. Something that you think you've enjoyed the most in this industry.

Mark Kurusz: I'll answer that two ways: I think there's always the instant gratification of the patient coming off the pump without a lot of flailing around, [like] putting a balloon pump in. Because that means you did a reasonable job, and the surgeon did a reasonable job, and the anesthesiologist did a reasonable job, that got the patient through their surgery. So, that's the instant gratification part. And unlike ECMO, which may be weeks before you successfully wean a patient or unfortunately the patient doesn't survive, CPB is pretty much in and out. And you'll know how things went that day. On a more global perspective, my background was in English literature. And I think that being able to have the free time to go to the library, research a topic, really get to know a topic well, and then write up a paper, was gratifying, as well. Especially when in the first instance, the paper won a prize for being the best paper at the meeting. That was really quite unexpected. But as I look back on some of the review articles that I've published, it's really gratifying to see that something's been understood, committed to paper, and now will be available to others. So, there's that aspect too.

Dave Fitzgerald: Well. You've certainly shared a lot with this industry over your 38 years, and that I know on a personal level with what I've learned from you and what I've learned from some of your peers and colleagues in the industry in my 18-year career. But in the mindset of sharing, tell us, do you have any perfusion related stories, photographs, or videos from your career that you'd be willing to share with the rest of the industry?

Mark Kurusz: Yes. I certainly could dig through the archives and find some. One picture in particular stands out. It was very early in Galveston. This was before the AIDS epidemic, and we never wore gloves. There's a picture of me running the machine. I have blood up to my elbows and we're just kind of working away, oblivious to blood exposure. Well, that all changed, of course, in the mid-1980s. So, there's that picture. I used a slide yesterday of simulation in quotes from the Hershey days, which was really going to the dog lab. We didn't have sophisticated simulation back in those days. It was going to the dog lab and pumping dogs. That's how I learned a lot of perfusion. So, I've got that photo, but it was... Well, I'll stop there. There were certainly memorable events. Because we've got a little bit more time, I will share one case that did not result in the patient's survival. The surgeon wanted to use cardioplegia for a big arch aneurysm. He reasoned that because cardioplegia was so good for heart muscle, that it would be protective for the brain. He asked me if I could set up a circuit that would have a reservoir with cold crystalloid cardioplegia for perfusing the brain. And I said, "Yeah, we can do that." So, I'll never forget the patient's name, which I won't... and he had a bad aorta. Preparations were made. They opened the chest, and they cannulated the carotid arteries with a separate circuit that was hooked up to a reservoir full of cold cardioplegia. And when he said,

“Are you ready to give cerebroplegia?” I said, “Yes, sir. We’re ready.” We were on bypass at that time, supporting the systemic circulation. We slowly pumped in about two liters, as I recall, of crystalloid cardioplegia into this patient’s carotids. Well about midway through the case, the anesthesiologist said, “The patient's eyeballs are coming out of his skull,” and patient was as white as a piece of paper, and the cause of death was bleeding. So, I’m not sure that patient ever would have survived for whatever reason, but clearly crystalloid cardioplegia may be good for the heart, but in that case, it wasn’t good for the brain. And that, I’ll never forget that case.

Dave Fitzgerald: I’ll bet.

Mark Kurusz: So, I have to tell you, I mean, this is unbelievable, Dave. I haven’t touched a heart-lung machine in five years, and I still have nightmares about not being able to set up in time to go on bypass.

Dave Fitzgerald: You’re not making me feel any good.

Mark Kurusz: To this day, I wake up... Not every week, but enough, five years out that I’m running around trying to set up the heart-lung machine because they’re either pumping on the chest or the surgeon’s saying, “Get the pump ready.”

Dave Fitzgerald: So that doesn’t go away. Great.

Mark Kurusz: I thought you’d like that.

Dave Fitzgerald: No, I don’t like it, but I can understand your point.

Mark Kurusz: Yeah.

Dave Fitzgerald: Well, Mark, lastly, what can you relate to the AmSECT professional audience as a memorable event that occurred during your career, aside from keeping you up in the middle of the night with pump nightmares?

Mark Kurusz: Well, I think there’s, again, broadly speaking, the early AmSECT meetings, and the first AmSECT meeting I attended was 1972. My only recollection of that meeting was a lot of very busy people running around. And then there was a lot of partying going on. I think to contrast that with the AmSECT meeting today, this week, and even really in the last decade, there’s been a maturation of the field. Certainly, presenting papers and having significant dialogue when papers are presented has really moved us into the professional arena, as opposed to the technician days. When I got into the field, you could get ten perfusionists in a room and say, “Well, what was your background? What was your background?” Everybody’s background would be different. Well today, everybody’s homogenized. They have all graduated from an accredited training program, and there’s some consistency, I think, in the curricula. So, what you see today, if you’re hiring a new perfusionist, is a fairly known entity. Whereas in the old days, some of them worked out and some of them didn’t work out. So, I think that’s been

the major change I would see. Certainly, we talked a bit about technological changes, but from a professional standpoint, AmSECT has been around, as you know, since the 1960s. There are other meetings that they're competing with, namely the American Academy, and certainly there's some very good regional meetings that are put on to satisfy continuing education. So, that's been the real change that I see, David, is just a notching up to the professional level.

Dave Fitzgerald: Well, we have you to thank for that. You and the pioneers that had dedicated their lives, their livelihood, and their careers to this industry so those of us that are still practicing have the opportunity to benefit from that. This has been a tremendous honor for me to have the opportunity to sit down with you and interview you, as one that I've recognized since I've been in the profession as someone I try to model myself after, this is been a tremendous honor. Thank you. And on behalf of the society, thank you for taking the time to share your life with us.

Mark Kurusz: It's been a pleasure, David. Thank you.