SA: Hi, I'm Steven Ash. I’m a practicing nephrologist with Indiana University Health Arnett in Lafayette, Indiana, and I’ve also been involved in many of the new projects and devices in dialysis over the years. It’s my pleasure today to interview Christopher Blagg who was a vital and pivotal force in the early implementation of hemodialysis both for acute renal failure and, of course, chronic renal failure and the whole establishment and concept of home dialysis. This interview is part of the Project Bionics Pioneer Series in artificial organs. So, Chris is certainly a pioneer in this particular field. His education started at King James Grammar School and finished at the University of Leeds School of Medicine with an MB/CHB degree; that was in 1954. He then was a house physician, resident and fellow in Leeds Hospital and had a short stay in the United States as an international research fellow at the University of Washington. He then returned to Leeds but he eventually returned to Seattle as an assistant professor and finally professor of medicine and emeritus professor at the University of Washington School of Medicine in Seattle. He also served in the military from '56 to '58 and the reserves after that and has published over 300 peer reviewed articles, a number of textbook chapters, at least 15, and has given innumerable presentations on the field of dialysis. He’s a stalwart member and contributor of ASAIO and ex-president and also one of the original founders of the International Society for Hemodialysis. So it’s my pleasure to introduce Chris Blagg. So let me ask what made you decide to be a physician in the first place?

CB: About the age of twelve or thirteen, I got to know the local doctor in our small town, who was a very nice man and I was so impressed by him. I mean, I only went to him, I forgot what it was, it was something very trivial, but he was so nice and he used to see me occasionally and stop and talk and so and I thought, “That sounds interesting.” So, that was it from about the age of thirteen onwards.

SA: And you were living in Yorkshire, small town?

CB: Yes, small town. Somewhat bigger town. I suppose it was a suburb really of Leeds big city.

SA: And that experience led you to finishing your medical degree and then, of course, you served as house physician at Leeds Hospital as well as Brompton Hospital. What sparked your interest in nephrology? Or I guess there wasn’t nephrology in those days, but there certainly was the early stages of dialysis.

CB: I don’t think it was sparked, it was pushed on me because when I came out of the Army I was interested in thyroid disease and I got a research fellowship in thyroid disease and ran the radioisotope clinic, RI clinic, in Leeds General Infirmary. They had the first dialysis unit in Britain since immediately after the Second World War. It started in 1956 and was
run jointly by a urologist and a member of the Department of Medicine. Well, about two weeks before I went back to Leeds, the internist, who was the Department of Medicine's representative, his child was killed and the professor thought that, as his wife was American, he should go back to America for a year to help her get over it. I was the bottom of the totem pole, so I was told to go and help Frank Parsons with the artificial kidney and it was help because we didn't have a technician for the first year I was there.

SA: Wow.

CB: We served the whole of Northern England, Scotland, and Northern Ireland and most of the patients came by train; there weren't helicopters and things like that in those days.

SA: And they were mostly acute dialyses.

CB: They were all acute. I think there's a lot of people didn't, if they didn't recover renal function within two or three weeks we biopsied them and if they had chronic renal failure we said nice things to them and sent them home to die.

SA: And the equipment you were using at that time?

CB: Was a Kolff-Brigham Artificial Kidney, which is the rotating drum that Kolff developed and which was manufactured, slightly modified, in Boston by John Merrill and Ed Olson. So that was our machine.

SA: How many did you have?

CB: Oh, we only had one machine.

SA: Just had one.

CB: One machine. I mean on occasion, at least one occasion we worked for 36 hours because the patients came in; it was very interesting.

SA: It was a rotating drum and you thread the cellophane from the roll?

CB: We put the cellophane, it was a little piece of equipment, and put it in the sterilizer and then, yes, we wound the drum, we measured out the chemicals and put them in the tank and then one of us would sit at the end of the drum while we were dialyzing, because if you're not careful you can get blood to accumulate in the bottom of the drum. So you had to keep the rotation just right.

SA: Wow. And access?

CB: Access -- cut down on the artery and the vein and either Frank did it because he was a surgeon or we would have one of the regular surgeons come and do it for us.

SA: To cut down and tie a catheter in and leave it for a few days probably?

CB: No, no, we took, we had it in the dialysis.
SA: And put another one in.

CB: Put another one in.

SA: Pretty laborious surgery.

CB: Yeah.

SA: And so you went then from the military back to Leeds and then you had this opportunity for international research fellowship in Washington. By the time you had done about how many dialyses?

CB: I have no idea. We had been doing dialysis for five years.

SA: Yeah.

CB: So several hundred patients; but I’m sorry, I had another thought--

SA: You had already used a Scribner-type shunt as well?

CB: Yes. We used to get the minutes of the meetings of the American Society of Artificial Internal Organs. “Scrib” [Belding Scribner] talked about the shunt in April 1960 and we got the thing by mail in Britain about August or September and we wrote off to Seattle and got some Teflon tubing and the mandrel that you wound it around and all that sort of thing. Early in 1961 we treated two chronic patients, one of whom died after about a month and the other whom lived for somewhere between three and four months and as I said earlier, he died with more calcium than I think I have ever seen before or since, but because we were a big, active acute program we decided we couldn't do chronic dialysis.

SA: Right.

CB: Because it interfered.

SA: So what did you find different in Seattle?

CB: Well, it was the Division of Nephrology was really devoted to dialysis. Dr. Scribner was a wonderful person and we had fellows. I was one fellow from Britain, there was a fellow from France, fellow from Switzerland, it was an intellectual mix [inaudible], and I was fortunate because having done all of these dialyses, I used to relieve Scrib during rounds and things like that with the fellows; but I was planning to do, we had done animal studies in England on using anabolic steroids. On rabbits, we had done some studies, on Frank’s and my rabbits, and I wanted to do that in Seattle but the medical director of the Seattle Artificial Kidney Unit didn't care for the university fiddling with his patients. So I never really got to do that so what I did was play around with hypertensive rats for a year, which was interesting because I had done some rabbit experimental work but I had never worked with rats before; I've never worked with them since either.

SA: They were establishing at that time some kind of a chronic program?
CB: Oh, they had it already.

SA: Right.

CB: Scrib started four patients during 1960, one of whom died after about a year, the oldest one of the four, and he wanted to treat more patients and the hospital wouldn't permit it because they said there wasn't enough space to treat more than he was treating already, because there was also an acute program there, an acute program for the whole State of Washington at that time. So, in 1961, he approached a doctor called Jim Haviland who had been associate dean at the University of Washington. In fact, it was probably the stimulus behind the development of the medical school at University of Washington and Jim was the president of the King County, of the local medical society. So, Jim knew what was going on with Scrib, and Scrib persuaded the King County Medical Society that we should have an outside-of-the-hospital, free-standing dialysis unit. The other thing about it was the experience gained in dialyzing in the hospital showed that you didn't need to have a doctor there. I mean before that they always had a doctor, you know, almost on the spot for dialysis. The Seattle Artificial Kidney Center was established in 1961, all the arrangements for it, and it opened in January 1962 as the world's first out-of-hospital dialysis unit. The big problem was how do you pay for patients? The John A. Hartford Foundation, which is A & P Foods, gave a grant to the Seattle Kidney Center, a three-year grant. So the next question was who do you treat? Because the estimate based on what the local insurance people was there was somewhere between 50 and 200 patients in the State of Washington who had chronic renal failure each year and they had initially three beds to do dialysis in, which meant they could treat 9 patients because it was patients twice a week overnight. So, something had to be done. So what happened was they first established a medical advisory committee who decided what the criteria were going to be, but basically it was between the ages of 18 and 40 and later 45, and with chronic renal failure who had no complications except controlled hypertension, and they had to be a resident of the State of Washington; and all the patients who were the medical advisory committee believed were suitable candidates for treatment were then reviewed by an admission's committee, which was the infamous seven-member committee that the Life Magazine article in 1962 showed in silhouette; and there were two physicians on it, neither of whom was an nephrologist, and five other people including a housewife, a banker, a man from the insurance agency and I forget, oh, a reverend gentleman who became the chair. Anyway they never met the patient except on one occasion. They took all the information they could get. The patients were reviewed by a psychiatrist or by a psychologist, whichever seemed appropriate, and they made this difficult decision about who was to be treated. So by 1964 there were actually 12 patients being treated and, of course, this became notorious in this committee. It was called the life or death committee in the Life article, but since then it's got if you like changed to life and death committee or death committee and so on and various; George Friedman [phonetic], for example, said we'd never do anything like that in Georgetown; it's up to the physician to make the decision. Well, the concern in Seattle was what's the poor guy who is the medical director of the kidney center going to do? How is he going to decide when
Senator Jackson calls him and tells him, “I’ve got this friend who you need to treat,” and then he was in an impossible situation.

SA: Yeah.

CB: So, it just gradually grew from that.

SA: When did the idea come to you that patients could do this at home?

CB: Well, it didn’t come originally to me. The first people to, the first person to do it was the Brigham in Boston. Eugene Schupak, who was one of Merrill’s fellows, used to travel into work with a patient who was a neighbor of his I believe, and he thought about it and decided that the patient and his wife were quite capable of doing dialysis themselves. So he told John Merrill about this idea. So one Saturday morning the division sat down to discuss this and I think the numbers may not be absolutely correct, but there were about eleven people there and Dr. Merrill and Gene Schupak proposed what he wanted to do and talked about any questions and so on. So they had a vote and the vote was ten people against it, one for it, Gene Schupak. Whereupon Merrill said something to the effect of, I’m the head of this division so that gives me twelve votes, so we’ll do it. They treated this first patient in January of ‘64. In Seattle it was a bit different. There was a fifteen-year-old girl with chronic renal failure due to systemic lupus. She was under aged, she was not the right age to be treated, she had a complicated disease, and so she was turned down by the committee. At this point in time the University of Washington was using a proportioning system for the four stations that were in the dialysis room that had been developed by Dr. [Albert] Babb and his team. He was the professor nuclear engineering at the University of Washington. So, sometime I guess probably about April of that year, Dr. Scribner called Dr. Babb one morning and said I need your help, and explained what the problem was and said can you make a single patient machine? He said yes, and they had that by June and the patient, Caroline Helm, started dialysis in June, went home in July and so that was after the second program. The other program of home dialysis was in London, Stanley Shaldon’s program, and Stanley had been running a program where patients could come in in the evening and basically dialyze themselves with a nurse running around there. So Stanley, when Stanley heard about this, he started to do home dialysis. What Stanley did, though, he was the first person to do overnight home dialysis, and came and told Seattle about it at the meeting that Eli was there too in 1964, and so by, oh, probably the spring of ’65 we changed; all patients were changing over to home dialysis and many of them overnight.

SA: Three nights a week or four?

CB: Three nights a week. By that time the standard in center or at home was six hours three times a week, but if you did it at home and you did it overnight you could dialyze as long as you wanted.

SA: And the equipment by that time, the dialyzer was -

CB: -- the dialyzer was the Kiil.

SA: So the patients had to assemble it every treatment.
CB: No, because they learned to reuse it so the patients could dialyze for two weeks and then they had to change the cellophane and everything else.

SA: How did they sterilize it?

CB: Filled it with, I guess with formaldehyde and then rinsed it out before they did the dialysis. The advantage of the Kiil was it had a small blood volume. The coil had a much bigger requirement in terms of volume.

SA: And, again, the access for the first home patients, the shunt?

CB: Was the Scribner Shunt, which Scribner, Dr. Dillard, who was a cardiac surgeon, and Wayne Quinton, who was the hospital engineer at that time, devised. It came about in a strange sort of way. Dr. Scribner had talked to the doctor’s dining room about how he wanted to treat these patients, and so a different cardiac surgeon said to Scrib, “You should go and talk to Wayne Quinton in the engineering lab because he has this Teflon tubing and we, the cardiac surgeons, we use it to wrap around pacemaker wires and we use it for the, if you like, the monitoring of post heart surgery for first day or two because blood doesn’t clot in it.” So he went there and told Wayne what they wanted and two weeks later Wayne showed them what they wanted, and May 6, 1960, they put it into Clyde Shields and it worked.

SA: Yeah, it still works in some places.

CB: Yes.

SA: And what, back in those earlier days what was your feeling and impression of dialysis? Were the patients much healthier after the dialysis was implemented?

CB: Oh, yes. Yeah. We talked about the chronic patients.

SA: Yeah, the chronic.

CB: The chronic patient, yeah, because we were dialyzing them six or more hours, three times a week. When they went home, they could do more if they wanted. We didn't increase the frequency; we stayed at three times a week.

SA: Right. There must have been at least a feeling of you weren't sure how long this was going to go with any one patient or what the outcome was going to be?

CB: No, I think by the time the, you know, fairly early one from starting the kidney center it became obvious that the only death that occurred was one of the university patients about a year out and he was a 45-year old man who I think had angina. He wouldn’t have gotten into the kidney center program and then the next death was the patient I mentioned to you earlier who came from Kolff’s unit and who died in 1966. He was the first death in the kidney center. These were all very selected patients.

SA: Yeah.
CB: It was exciting rather than worrying.

SA: Yeah, it must be. Did you find it amazing that a simple collection of cellophane and salt water could remove the uremic toxins well enough to wake someone up from uremic coma or improve?

CB: Well, not really, because I was catapulted right into it with the kidney patients. So, you know, I was used to it. For example, one thing that we didn’t really know about, say, in 1958 was this was a time when we began to learn about the problems of patients with high blood ureas who then developed cerebral symptoms when you quickly dialyzed them. There were lots of things like that that we just found out because they just happened.

SA: You were pretty instrumental in expanding that home program in Seattle, right?

CB: Well, not initially but, yes, I came, I mean in the Seattle program, we only had twelve patients on home dialysis. We had another grant from John A. Hartford and the kidney center had a small number of patients and around about 1965-66, as the kidney center was slowly growing, Scrib talked about home dialysis and why it was better and so on and so the kidney center started its own program and it grew and grew and grew. I think the maximum number of patients he had must have been I think about 1980 with 300 patients on home hemodialysis.

SA: Really? Wow. What do you think have been the biggest improvements of dialysis since those days?

CB: Good question. I can tell you some things that are bad, but, well, obviously, there are newer machines. There are the disposable dialyzers, the hollow fiber dialyzers and the other disposable dialyzers. In terms of the machines, they’ve not changed all that much. I think the best machine was the ill-fated Aksys machine, which we were the first people to use in about 1998-99, which was based on 1990s technology, but for our home patient it was ideal. I used to tell the patient when you come home, you switch the machine on and then you either go and have a beer or a coffee for 20-25 minutes while the machine warms up, you then connect yourself to the machine, do the dialysis, and at the end of dialysis you unplug yourself from the machine, stick two bottles of chemicals into the machine, pull a switch and leave it and the machine cleans itself, makes dialysate and so on and you never have to touch it again until you come home for the next dialysis. But, of course, the company went bankrupt because it was badly run from a business point of view.

SA: Yeah. That was unfortunate. You were pretty central in that whole machine effort, right?

CB: Well, because I knew Carl [inaudible] who was the medical director of the company. Yeah, we were the first people to do it for the FDA studies; and the interesting change to my mind is that when we did the studies for the FDA, we took the patient and trained them in the center for three or four weeks and once they were trained we sent them home. Well, the FDA since then has come to the belief that there’s something different about dialysis in the home so that now if you have a new machine, you have to dial it, use it in the center for
Christopher Blagg interview, June 20, 2014

quite a period of time, to show it’s safe, and then you’re allowed to do another study at home to show it works in the home. So that’s a big change that’s occurred with time.

SA: Right. That’s certainly counter to general experience. I think the overall safety record for patients on home dialysis is at least as good as in centers.

CB: Oh, yes, yes.

SA: Right. So, that was the Aksys machine.

CB: Then the next stage machine came along which, you know, it was an interesting machine. I have to say that several of our patients who have been on the Aksys machine had to transfer, went into mourning because they didn’t think it was as good as the Aksys machine, but on the other hand it served its purpose very well.

SA: It’s certainly a simpler machine.

CB: Yes. There's no question.

SA: Do you think that innovation in nephrology like those two machines is pretty slow?

CB: I think it has been slow, but of course, I mean you've got to know that you're going to have a fairly big audience if you're going to make a new machine. I mean you can't just do it and then everybody's going to grab it. I think that in the U.S. part of the problem has been the Medicare program and to go back in history. In 1966, Gus Hanfers and Ted Hager [phonetic spellings] in Merrill’s group when, like Seattle, the hospital would not allow them to be doing more dialysis because they had this transplant program that took everything, they established what I believe is the second out of hospital dialysis unit in Normandy House, which was an extended care facility in Boston. And it was fairly successful and in 1968 when they wanted to expand, business people got involved and a for-profit company National Medical Care was founded and by the time Medicare came in in 1973, I think NMC had about fifteen different units scattered in several major cities in the U.S. and it’s gradually become so profit oriented I mean not just for [inaudible] and national medical care but much of the system has become so profit oriented that most patients dialyze less than four hours. If you go to Australia, in Australia four hours, three times a week is the minimum. It’s usually more like four or five hours three times a week if you’re not at home. So I think that, but of course American health care, we won’t talk about this, but medical health care has its problems generally.

SA: It’s certainly if not diminished the cost of dialysis from whatever they've done.

CB: No.

SA: Yet home dialysis is, it should be more profitable.

CB: Well, it is.

SA: Yes, right. Even if it’s done four times a week it probably still has lower cost.
CB: Oh, [inaudible] and I thought the cost was somewhat, you could get enough money to pay for somewhere between four and five dialyses a week.

SA: So why hasn’t that grown faster? Is it a problem with technology? Is the technology too complicated?

CB: No, I don’t think it’s that. I think the problem is that general problem in the U.S. is that most of the university training programs, while they may see lots of dialyses in sick patients in the hospital, they don’t see what’s happening in outside dialysis units or particularly in home dialysis. It’s only a handful of programs that do any of this and the boards of nephrology have very little about dialysis in them. So I think it’s educational as well as financial greed and things like that.

SA: What do you think of peritoneal dialysis?

CB: I think it’s a very good treatment, as an initial treatment. I mean I think the experience is that most peritoneal dialysis patients that their peritoneum starts to fail after two, three years. I mean, some go much longer, but in many ways I believe that what we should be doing is catching patients long before they need dialysis, six months or more before they need dialysis and educating them. When they get to the point of needing dialysis, I think, again, patients have to have their own options but I think the ideal is to put them on peritoneal dialysis. They can be trained in a week and as one of the early CAPD patients said to me the only problem with it he said is I’m a businessman and I travel around locally everyday and he said I have to start thinking at 9 o’clock in the morning where am I going to do my 1 o’clock exchange. He said that’s the only problem that he could see, but I think it’s a good initial treatment if the patient is willing to do it, educated, and I believe that consideration should be given to putting a fistula into their arm once they’re safely well-established on peritoneal dialysis, so when it starts to fail they can be transferred quickly. There’s no point waiting until it’s become absolutely impossible to do peritoneal dialysis for it to change.

SA: Certainly when the patients lose residual kidney function it gets a lot harder to support them with peritoneal.

SA: The take-off catheter, of course, came from Seattle.

CB: That’s right. Actually peritoneal dialysis in many ways because Fred Boen from Holland wrote his thesis on peritoneal dialysis in 1958 and Scrib read it, and we had actually tried peritoneal dialysis in England, but again the same problem with a busy acute program we couldn’t have peritoneal patients around. Anyway, Scrib read Fred’s thesis and he invited Fred to come in 1961 to Seattle. Fred developed a machine for doing peritoneal dialysis using 40 liter carboys dialysis and sent his first patient home using this system I think in late 1963 or maybe 1964. And at that point Dr. Tenckhoff, Henry Tenckhoff, had joined Fred and the first patient they had at his home lived in a suburb probably about a mile away from the university hospital. So one or either of them would go up and stick a catheter in her belly and then she would do the dialysis and pull out the catheter herself and the next dialysis, that was done I think three or four times a week. Next dialysis Henry or Fred would go up and stick a catheter in. So that’s one of the things that led to Henry
developing the Tenckhoff catheter; and Henry actually, he has these Dacron cups that hold it in place, Henry actually implanted Dacron, not cups and catheters, but Dacron into his own abdominal wall to prove that tissue actually grew into the Dacron cuff.

SA: That’s a man who is involved in his work.

CB: That’s right. And, in fact, Fred and Henry developed a machine, which the [inaudible] Company made for us which was like a big pressure cooker to prepare the dialysate, and then a company in Seattle, Physio Control [phonetic], which is basically a heart technician, technology type company, who Scrib and I knew their president. They came up with a home peritoneal dialysis machine which used ultraviolet light and things like that to sterilize the dialysate, which went very well. We probably had twenty or thirty patients on that.


CB: CAPD was developed and, of course, then no machines were needed for a while until [inaudible].

SA: Well thinking of the PD area then thinking of the Physio Control machine and Drake Willock had one as well.

CB: That’s right, that’s right.

SA: It worked as proportioning, they were beautifully simple and had very low infection rate. Why don’t we have that sort of thing available for PD? Why are we shipping 20 liters a day for people on cyclers and things like that?

CB: I don’t know.

SA: And, you know, you are right that you have to know where the market would be, but we’re talking about home dialysis.

CB: Well, as you know, I mean home dialysis at the time Medicare came in was about 35% of the patients, about 10,000 patients, about 35% of them were on home dialysis and it gradually declined over the next few years and by 2002 it was down to I think .5 or .6% of the entire population. It’s started to grow again.

SA: Slowly.

CB: [Inaudible] and now particularly [inaudible], but everybody needs, patients, doctors, nurses.

SA: There’s a very high fistula rate in Seattle as well; isn’t that correct?

CB: Actually that’s correct. I don’t think it’s as high as it was and one reason is for many years we had three vascular access surgeons who were partners who did all our vascular access surgery and, of course, one of them has died and the other two are retired. Then before you knew it every nephrologist in the community has a friend who is a vascular surgeon who is doing fistula. So that’s one of the problems.
SA: What did you think of the idea of a fistula when you first learned about it?

CB: I thought it was very clever. I mean Scrib was upset that he hadn’t thought of it. [Laughter] Very clever indeed. Scrib and Cimino didn’t meet for quite a number of years but there was a Renal Physician’s Association Meeting they both talked and met and somewhere I should have a recording of the two of them talking about it all.

SA: Yeah, it definitely was clever.

CB: Yes, it was. You know that as a medical student he had been working at a blood bank. Did you know that?

SA: No.

CB: He had been working at a blood bank and he had been sticking big needles in vessels and I think that had something to do with it.

SA: You have been a long-term supporter of ASAIO and the president in the past, and in terms of innovations like we’ve been discussing, what’s the role of ASAIO?

CB: Well, it’s more difficult now because there are so many other societies that dialysis and related subjects and we discussed that. So I think it’s unfortunate with these declines over the last fifteen to twenty years because I think many, many good ideas in those early days many very good ideas were developed at the ASAIO meetings. I don’t know now whether it’s worth, you know, whether this is a death knell for dialysis in ASAIO.

SA: This year’s program looks encouraging, though, wouldn’t you say? This year’s program looks encouraging.

CB: I saw some interesting things there, yes.

SA: Very well done, but you’re right it’s become more of a minority --

CB: -- uh-huh, minority.

SA: --portion of the presentations.

CB: After all it was one of the two big things in the 50s and 60s.

SA: Right. If a physician or a scientist has a new idea in dialysis, would you think it fits better at ASAIO or ASN?

CB: Probably the ASN you get much more international audience, but if someone wants to send it to ASAIO that’s fine. I think that’s the trouble; they now tend to send it to local societies in different countries and send it to the ASN and send it to the annual dialysis conference and so on. There are many options so--

SA: Probably get a lot more feedback at ASAIO.

CB: Oh, you’re right, you’re right.
SA: You've published over I think almost 350 –

CB: -- most of them are repeats of the same.

SA: That’s being modest. What's the value in publication to you? Why write the papers?

CB: Well, I think if you've done something or you have an idea that you think is potentially useful to others then publications are a way to get it out. Now whether ten years from now there will be any journals or whether they will all be on the web is the question because I think some journals now, for example, Hemodialysis International, has just decided that all case reports will, they will be listed in the journal but they will be on the web unless the editor in chief says this is a particularly special one that should be in print. I think that in the tendency to use the web is spreading much faster than [inaudible].

SA: As an author, do you still feel something special about seeing it in the paper edition?

CB: Well, I don't because as an author but I feel that way because I like to read the paper edition. I'm old and set in my ways.

SA: Yeah. Me also. You’ve been professor at major teaching institutions and have you thought that the institution itself supports the new technology, new direction, new therapies like on dialysis?

CB: Well, just based on my experience, see I've been in two very good places. Leeds was a very good medical school and the University of Washington is a very good medical school. I think that, and I'm sure that Downstate Medical Center and there are places where I think are very supportive of technology and new ideas and DNA work and all sorts of things.

SA: That adds a lot to your zeal to do something.

CB: That's right.

SA: In the department.

CB: Well, I think this was one thing that Scrib was very good at, and he would encourage people to write and if you notice most of the time papers that came out of Seattle, Scribner was the last name on them. I mean there are some institutions where Scribner would have been the first name on everything.

SA: What do you see as big challenges for ESRD looking ahead say twenty years?

CB: Clinically I think the challenge is what you do about the elderly and the other patients who are not going to do well on dialysis and how do you manage palliative care and so on. That’s not to say that you can’t have very elderly patients who do very well, but the RPA showed about five years ago something like 10 to 15% of patients don’t complete their first year on dialysis, either because they stop or they are stopped and it’s expensive and the way health care costs are going to continue to go up in this country I wouldn’t be surprised
if some day somebody says, well, we can't treat all those dialysis and transplant patients unless there's some changes of some sort.

SA: And is that likely to come by some governmentally worked out algorithm or is it more likely to come from just continuing to decrease resource payments?

CB: I think probably both. I don't know. I mean it's obviously, you've read about Hepatitis C drug, for example, it costs tens and tens of thousands of dollars to treat Hepatitis C, very successful drug. I mean all the other cancer drugs somehow, somewhere, something has got to be done to change the system. My personal view is that if Obama, rather than develop what he did, had somehow managed to get a single payer system through it could have been an insurance company, but just one payer rather than, I don't think competition has done much to reduce cost in dialysis.

SA: No. Certainly a complicated system is not very efficient. If a machine were simple enough for patients to understand, with a few knobs, what percent of people do you think could do home dialysis?

CB: The time I was at a meeting, probably about seven or eight years ago when we were talking about the Aksys machine, there were a number of nephrologists there and we went around the room talking about this question and I think the general conception was that maybe 15 or maybe as many as 20% of patients could do it appropriately with appropriate machines and so on whether we get to that point. Even New Zealand, which has the highest population of home dialysis, is about 18%. So I think that's about the maximum.

SA: What recommendations will you give to our young physician, maybe a house physician who has an interest in dialysis or a treatment of end stage kidney disease?

CB: It depends on what his interests are. If he's interested in research, I think there are lots of exciting other things going on in nephrology these days. If he's interested, that would be great fun. Dialysis isn't all that interesting; you know that. I mean, I don't know what I would have done if Medicare hadn't come in and I hadn't been made medical director of the Kidney Center because I had the opportunity to do a lot of political things. I mean dialysis is boring, the nurses do it. So, I don't know. I mean I think they should see, I mean I think all people in training ought to see dialysis and see all aspects of dialysis, but I don't know beyond that I'd push them. I mean like my life so to speak, I think that what happens to medical students when they qualify is that some extraneous things might make them think about this or that or the other. I don't know that you can persuade them if that's what you would be doing.

SA: Yeah.

CB: Unless they want to make money.

SA: So, in the field of nephrology, would you say that that would be your choice if you could do it all again?
CB: Probably not now. I mean at the time, I mean really in the late 50s through sort of 70s at least, it was a growing, changing, exciting area. Now it’s become a sort of huge treatment program that is there and may never go away unless, you know, what about if somebody could actually develop a, well, first of all what about xenotransplantation? Will that ever work? If that would work, that will be wonderful because we all agree transplantation is the best treatment.

SA: Sure.

CB: What about developing kidneys from cells and perhaps having [inaudible] that was made in the laboratory. I mean there are things like that that can make a big difference.

SA: Exactly. There's presentations [inaudible] about that for sure.

CB: That's right.

SA: The concept of a wearable, an artificial kidney, either hemo or peritoneal is certainly here.

CB: That's right, that's right. I like Marty Roberts. I think because my biggest concern about wearable artificial kidney is blood access. I mean there’s literature in terms of home dialysis now and some of it says there’s more blood access problems with [inaudible] other literature says there isn’t, but I would certainly worry if everyone’s running around with blood access. I don't have, that should be solvable too, I assume.

SA: I agree.

CB: Probably with [inaudible].

SA: Hopefully next year.

CB: Yeah.

SA: You've seen four generations of blood access from the Scribner shunt to the fistula to the graft and then the double lumen catheters. Since that latter one it's been over twenty years--

CB: Yeah.

SA: --since the last innovation.

CB: I think it’s not a very glamorous subject, I think, blood access.

SA: It's a remarkably difficult area without much glamour that's for sure.

CB: Yeah, exactly.

SA: If you had your career to do over again, would you do anything different or your life?
CB: Well, at the time it was right. I mean I think I've had a wonderful career. I don't know what I would do now. I suppose I might, well, because I was academic originally. I might enter some other field or some other part of nephrology.

SA: Go back to thyroid treatments?

CB: [Inaudible].

SA: Radioactive iodine. And you've certainly had a very supporting and loving family. Has that been a challenge with all the other things you've done?

CB: Well, yes, I mean I think my wife has been very long suffering, though now that our children have grown up I mean she can come with me to meetings and she does most of the time. She would have been here if she hadn't had this problem.

SA: Yeah, wonderful.

CB: But my children, I don't know. My youngest once made a comment about, oh, I know, my wife was driving a number of kids to school and they're all talking about my dad, you know, is this important, my dad is this, and Simon, my youngest son, remained silent and then when they finished he said, "My dad takes kidneys out of dead people and puts them in live people to make them live." [Laughter]

SA: That's great. It's hard to beat that, you know, when you think about it. And the whole field of transplantation is still somewhat miraculous.

CB: Yes.

SA: Even though it's more --

CB: -- these arrangements where, you know, you can't release a donor transplant because it doesn't match and they have a whole series of people who get a transplant that way.

SA: Yeah, the trade.

CB: Yeah.

SA: Great trade. Wonderful. Well, you certainly have a uniquely positioned and accurate assessment of a whole bunch of things in history. You're right it was an exciting time and a long journey. So thank you very much for the interview. It's been wonderful.

CB: Thank you for putting up with me.

[ Music ]