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President 1987–1988

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The obvious first question is when did you decide on a career in surgery and specifically trauma?

Dr. Donald S. Gann

The surgery decision happened to me in medical school. I initially intended to be some variety of scientist. I was sort of groping around. I had a bit of a head start working with some pretty distinguished physiologists but didn't have any sense of what I was going to do. I actually did a fellowship in neurosurgery and knew I wasn't going to do that. That was probably about the easiest decision I have ever made. I prefer my patients to be able to talk back.

I enjoyed the complicated physiologic preparations I was performing for my mentor in the laboratory, Vernon Mountcastle. I also found I was dexterous enough to do some unusually complicated things. I began to see what the surgical patient population looked like and decided I would enjoy working in that arena. I really wanted to take care of people. I got interested in the metabolic response to surgery early on, and thought I would do endocrine surgery.

Johns Hopkins was very oriented towards cardiac surgery and Dr. Blalock thought that anybody that didn't want to do cardiac surgery was not very interested in academics. He was very blunt about that. In fact when I told him I wanted to work on an area that had more to do with injury and metabolism and he said, "Where did you get a crazy idea like that?" I said, "From reading your book." He said, "That's old stuff."

He said he would help me get a job. I was supposed to go to the lab the next year, but if I didn't want to go work with Dave Sabiston, he would help me get a job.

He didn't think I was destined to go through the whole residency if I didn't see the world the way he saw it. He is a lovely guy, not mean, just speaking plainly.

Dr. Blalock got me a position at the NIH, which was wonderful. It allowed me to move my research career a long way and got me more firmly interested in things endocrine and metabolic. I decided to go to Cleveland to complete my residency. William Holden was the chief there, and that turned out to be wonderful move. In Cleveland, I fell under the spell of several mentors, the principals being John Davis and Bill Drucker, who both turned out to be future presidents of the AAST. That's how my introduction to trauma began. I still didn't really think I would do trauma as a career because I thought I was going to do nice, fancy elective parathyroids and adrenals.

Then some funny things happened at Hopkins and I ended up running a task force on how to run the emergency department. The president of Hopkins and I were good friends; and he said that he thought that I should be capable of making peace between medicine and surgery, who had been fighting over the emergency department for about 30 years.

We recommended a matrix management approach where nobody was the boss. I got to present that to the Hopkins Hospital Board of Trustees, who rejected it unanimously and dismissed me from the room. They told the hospital president that he should make me the head of the emergency department so they could target me if I didn't solve the budgetary problems.

So that's what they did. I suddenly became the head of a department that hadn't existed. At the same time they broke up the hospital budget and I got a big chunk of it. All of a sudden I was doing something I had no training for doing. It was more and more administration. I also saw that the junior residents were really being misused in the emergency department, doing stuff that probably could have been triaged out if we had nurse practitioners, which had just come on the scene. But we did have nursing aids who were of limited use, because nobody would let them even take a blood pressure. All they were doing was changing sheets and bed pans. I abolished those positions and hired five nurse practitioners who solved a lot of the problems by doing the triage in the emergency department. They took care of minor things and got a lot of people diverted from the ED to a walk-in clinic. We cut the number of visits down from 120,000 a year to 90,000 a year.

Livingston

Dr. Gann, what years were this so people can put it in context?

Gann

The early 1970s. When emergency medicine happened, Dr. George Zuidema decided to add an extra division, emergency medicine and trauma. I ran that until 1979, my last two-and-a-half or three years that I was at Hopkins. During that time I had been very active in organizing the trauma system here.

Although part of my job, not publicly announced, was to keep Dr. Cowley from getting

everything. I was a failure at that.

I subsequently got invited to come look at the surgery chairmanship at Brown at the same time that our four kids were about to go to college. They were pretty close together with twins in the middle. I didn't know how I was going to pay for that on what Hopkins was paying me, so Brown looked very attractive. It was a brand-new department.

I was at Brown for nine-and-a-half years and during that time we built the trauma center. We achieved a reasonable degree of organization in a very small state. I took trauma call every fifth night because nobody else would do it. I figured if I wanted a mostly volunteer staff to take trauma call I was going to have to do it too.

I took call up until to almost six months before I left. I loved it. I would get up in the middle of the night with no problem and come home at around 4:30, knowing I was going to get back up at 5:30 or so. But instead of going back to sleep, I started to lie in bed trying to think what I could have missed and stuff like that. At that point I decided it was time to stop.

Livingston

So it sounds like you got into trauma in a sort of backwards way and not completely by design.

Gann

Yes. But once I got into it, I loved the challenge. I loved having to operate when you didn't know everything already, where ordering other tests was not one of the options.

My residents also got exposure to all what I was doing and that has turned out pretty well.

Livingston

It sounds like Dr. Blalock didn't consider trauma or anything but cardiac much of specialty.

Gann

Trauma wasn't anything that people did there. Usually the most junior person got stuck with running the emergency room and the residents really did the trauma surgery.

Livingston

What do you think was the best career advice you received?

Gann

I guess the way John Davis put it was, "Don't let anybody tell you what you can do or can't do." Useless advice for a junior faculty member dealing with a chair or division director. He said, "Know what your capacities are and do what you need to do." That's basically how I've lived, so it worked out very well.

Livingston

Any particular bad advice you got that thankfully you didn't take or maybe you did take some of it?

Gann

The advice I really needed, but either I wasn't able to hear it or didn't take was, "Don't do so much." I just kept adding things to what I had on my plate and figuring it would sort out in the long run. And it more or less it did.

Livingston

From a scientific perspective of all the things you've been involved what are you most proud? How do you think it improved trauma care?

Gann

Actually, I think I'm going to be proud of the work we're doing now. I hope we're going to get it published this year. As you probably know, in the history of shock everybody said "shock was the road to death." That was all that was known about it, from the one of the first descriptions by Celsus in about 40 A.D. all the way to the twentieth century. Suddenly biochemistry emerged on the scene and people began looking for a toxin in shock that was causing everything.

The first thing they discovered was histamine. But people typically didn't get hives. One after another a new molecule was considered as it came along. None of them was a satisfactory explanation. The technology to perform the separation or identification of really small quantities was not available.

At that point in time, Dr. Blalock was at Vanderbilt, and he showed that fluid accumulation in injured tissues could account for a lot of what happened, and that it was basically plasma that was leaking into wounds. He said you didn't need to postulate a toxin, and that's how fluid therapy came in as the principal treatment in shock. But, as everybody who is taking care of people in shock knows, while most of the time fluid works, sometimes it doesn't.

When it doesn't, we still don't know what has gone wrong. In the '60s, Dr. Tom Shires discovered that the sodium pump was paralyzed following shock at around the 25% hemorrhage mark. At that point I was studying cardiovascular stabilization after hemorrhage. We found that the reflex to raise blood pressure, was primarily hormonal and a little bit neural, was 100% effective up to about 25% hemorrhage. After that point it always failed.

We had a talk at a meeting about this 25%-thing. His son, Tom Shires III, gave a paper at the AAST when I was chairing the session in which he showed that red cells got this same problem. Red cells don't have nerves, obviously.

Something had to be telling the sodium pump to stop working and we figured it had to be something in the circulation. My laboratory was fairly large and made up of a lot of fearless people. I was very fortunate to have had NIH support pretty consistently from the time I was a resident. We decided to just see what we could learn. We made some mistakes and had some

detours. The biggest one was initially identifying it as a protein.

I must have been the author of a half-a-dozen papers or so talking about this protein that caused all these bad things and then we tried to purify it. We purified the protein and discovered it was a piece of albumin.

Ed Deitch had the same experience attempting to isolate a toxic factor, but he lost the active fraction completely. We used a little bit different technique and we captured active fraction. We've isolated it for hemorrhage. We've purified and identified it. Most important, we have a method now, for measuring it with mass spectroscopy.

So we're measuring down as little as 10^{-15} grams (femtograms) of this stuff and it's active. Its activity is maximal at about 10^{-9}. We've now shown that it's the same material in rats and pigs.

We're now collecting human samples, which is a problem because the substance is not stable, although we know what it is converted into. It's a messy kind of method if we can't get the samples quickly. We also have an antibody. We found a man in the National Institute of Aging who is interested in the same kind of compounds that block the sodium pump. He has an antibody which is not totally specific but turned out to cross-react with this substance that we have isolated.

We've shown that it can reverse shock even when the animals are within five minutes of dying, after the blood pressure has come down into the 20s. If we give half a milliliter of antiserum at that point, the rats just respond beautifully. They wake up. They chew on their restraints and try to get up.

Livingston

Anything in your career that you thought was really going to be really great that you wish you didn't think it was such great stuff? Something you championed or said at a meeting that in retrospect your thought, "I wish I didn't say that."

Gann

I think everybody has had a bit of that in their career. I gave my first paper at the American Surgical in the late '70s and advocating total thyroidectomy, among other things, as a way to handle people with previous irradiation. The president of the association at that time was a distinguished thyroid surgeon at the Mayo Clinic and really tore me apart in front of everybody. I knew he was wrong and I was right, but of course I kept my mouth shut.

But I think that's probably as bad as I got. I've been pretty careful and fortunate not to get too involved in stuff that was really wrong.

I've told you I was obviously wrong about there being a shock protein, but we had to just do more research to explain why I was wrong. We still had to separate the protein from the active stuff, so ultimately I think we're on the right track.

Livingston

What do you think the two or three big advances in trauma care has been in your career?

Gann

I think one of the really biggest things was the whole business of what has now turned into damage control surgery. Bill Drucker and I are writing a review that is almost finished the *Journal of Trauma* series for the 50th anniversary of the *Journal*. We probably have the last paper that hasn't come in. It's finished; the problem is that it is more than twice as long as the *Journal* will publish.

I think that one of the most exciting things is the whole concept of permissive hypotension started with Ken Mattox's group. Ken was influenced by the way you treat people with ruptured aortas, allowing them to be hypotensive. I think that that's really changed care a lot, particularly intraabdominal packing and getting out with liver injuries. This has led to a tremendous increase in survival.

I think I probably would say number two was the understanding that sepsis was not necessarily the same as infection.

It certainly has changed what we do and how we do it and sometimes with success. I got involved with a multi-institutional study for a drug company using an antibody to TNF, which was supposed to save everybody. Turns out it killed a certain number.

Livingston

The practice patterns of trauma and emergency surgery have changed considerably over your career. What strikes you as the significant changes?

Gann

Certainly the evolution of group practice has made a lot of things possible. I consider myself very lucky to have always been part of one. One of the things that set me free was that I decided early-on that I didn't want to see how many cases I could do so I could feed my family. I have always worked for a salary. So I liked the emergent structure before it emerged. That's the way I have worked and that's the way I set up the practice system at Brown when I was there. Bill Cioffi is still using that. I think that that certainly is a major change, the whole idea that nobody has got to be responsible for everything all the time. It makes it much easier to stay in the game longer.

Livingston

What's been the part of the career that has been most rewarding?

Gann

People. Teaching is absolutely the most rewarding thing I have ever done.

Livingston

What has been the most difficult?

Gann

I think everybody that has taken over a new department of surgery has had the experience of wrestling with the people who have been there for a while and are very concerned about the economic consequence of any changes. There is the potential for conflict that is not always avoidable.

I was fortunate for a while in the Providence situation to be able to design a system with the help of a friend of mine who did a lot of business organization, so that people's incomes were not being damaged with my plan. I put off the inevitable for a good while, but as we began to fill the faculty, we began to account for a greater proportion of the surgical admissions. The last several years I was there, the full-time staff admitted over 40% of the surgical patients, and that created a tension between the university and private groups.

Livingston

What advice do you give residents or junior faculty who want an academic career in trauma?

Gann

I feel that the whole acute care surgery thing is going to change what we're talking about. I think it solves the long-term problem of where are the cases going to come from. They don't need to do what I did, which is have another entire specialty. I would never have survived at Hopkins if I hadn't had my endocrine practice. I think that the emergency surgery is just a natural process.

Livingston

So you see this as a great opportunity?

Gann

I think it's a fabulous thing. I wish I had thought of it first. I thought of it as potentially hurting a residency, and I think it would if people couldn't figure out how to cooperate.

Livingston

But you changed your opinion on that?

Gann

Pretty much. Tom Scalea really started doing it at Maryland while I've been there. I was running the fellowship at Shock Trauma before he came. I thought it was going to really hurt the surgical residency at Maryland, but it hasn't. The Shock Trauma Center in Maryland is more separated from the department than anywhere else that I know in the U.S. However, they have evolved a system that preserves critical experience for the residents. I think that if they can make it work there, it will work anywhere.

Livingston

What do you think the next great things are going to be in trauma, critical care or acute care surgery in the next ten years? You get to predict the future.

Gann

Well, it should be obvious from our talk that I hope it is the stuff we've been working on. But I have no idea what the probability of that is. Some days I think it's zero and some days I think it's 100%.

Livingston

Would you make any changes in your career?

Gann

Well, since everything I have done has been so unintentional, I don't think so. What I mean to say is that I really feel I've been pretty opportunistic and I don't think that has hurt me.

I think that one good strategy is to make as few decisions that are irreversible as you can, and see what happens.

Livingston

Any changes outside the hospital?

Gann

It also helps if you happen to marry somebody you want to stay married to. I think that makes a very big difference. It was and is fundamental to my career. I couldn't have done it without the kind of support I've had, not to mention somebody who is willing to live anywhere, almost. I learned early on that I've married somebody that's smarter than I am, and I like it that way; but she feels the other way about it, and that makes it nice, too.

Livingston

Besides working on your lab projects, what are your future plans?

Gann

I'm hoping to retire. I'm barely keeping a hand into the laboratory, but I've been lucky I've to work with a physiologist, Dan Darlington, for 20 years and he is really carrying the project now. That's really, really good fortune.