19

H. David Root, MD
President 1988–1989

Dr. Frederick A. Luchette

How did you decided on a career in surgery and, secondly, your interest in trauma surgery? What were the factors that lead to these decisions?

Dr. H. David Root

My background is that of growing up on a farm and having to work with my hands and solve problems plus taking care of animals. I had a curiosity of how things work and being able to recognize and solve problems from childhood. Medical school sounded exciting and it was. When I was finishing medical school, I was wondering what would be the most fun and rewarding. Surgery seemed to me to answer those two requirements: the satisfaction of helping people by surgical means.

I was intrigued by a program at the University of Minnesota under Owen Wangensteen, who encouraged research and development of ideas and advances in surgery or physiology. It appeared to be an opportunity to pursue my own curiosity of issues and trying to solve problems. Surgery seemed to be gratifying wherein one could see the end results of one's work.

My interest in trauma surgery, in particular, came by serendipity. The only trauma we were exposed to in my residency at the University of Minnesota hospital was an occasional broken heart of a coed. And we didn't have anything to do with trauma there except when my wife and I were in a motor vehicle accident and the surgical faculty took care of us.

I rotated as a junior faculty member at a city county hospital in Saint Paul. Then it was

called the Anchor hospital, named for a former CEO. It is now called Regions Hospital, a Level I trauma center.

It was at Ramsey County/Saint Paul City hospital where we received a lot of experience intrauma. And that's where I was "pushed off the dock," so to speak, and I had to "swim" in trauma with John Perry, a close friend and mentor. He was the senior faculty member there.

And so I got involved with the injured patients and became intrigued by all the answers we needed. Thus, developed my interest in trauma, as well as interest in vascular surgery, through research and clinical demands.

Luchette

Now, Dr. Perry and Dr. Wangensteen were obviously influential mentors. Any other mentors that you would like to mention?

Root

Well, yes I think Richard Varco who was a senior faculty member at the University of Minnesota had great influence on my development. He was an excellent technical surgeon and stimulated all of us to develop our skills, much needed in treating patients with complex injuries.

The emphasis at the University under Wangensteen was on research. I worked in his research lab for two years. We largely studied GI physiology. My PhD dissertation was in gastric physiology and the influence of temperature.

Dr. John Perry was my major mentor in trauma. However, once I was accepted by the COT and became associated with skilled surgeons like Drs. Tommy Thompson and Don Trunkey and all the other wonderful members, I realized that they all had an influence on stimulating my interest and enthusiasm and enjoyment of pursuing trauma surgery.

Luchette

When you were in training, there were a lot of specialties being established such as vascular surgery and cardiothoracic surgery. How did your peers view your choice to go into trauma?

Root

Well, trauma at that time was a non-entity. It was the sort of something that happened, but nobody really looked at it as requiring special attention and a lot of people died from trauma. And so it was really kind of ignored.

I was there at Minnesota when Walt Lillehei developed cardiac surgery. I really got into vascular surgery there under him and Varco. Gastrointestinal and foregut issues were the big clinical and research emphasis under Wangensteen. Gastric cancer was still a very serious and common problem which has since decreased in incidence. We treated many people with cancer of the esophagus and I got involved early-on with GI surgery as well as in the lab.

The early emphasis was on GI surgery. Even at that time, short-circuiting the small bowel was being performed by Varco to help decrease weight and cholesterol levels.

So cardiothoracic surgery was young and exciting. Vascular surgery was just develop-

ing, but the emphasis was on GI surgery, and trauma was just an incidental problem kind of interrupting the normal schedule of life.

It wasn't until the late 1960s that more emphasis was shifted to trauma. More surgeons began to recognize the need for managing the injured, even though Dr. Scudder in Boston began his work in fracture care in the 1920s.

I finished training in 1960 and went over to the Anchor hospital in 1963. The first saphenous vein bypass of occlusure arterial disease in lower extremity vessels had been done in 1949, but it was some time later in the 1960s that vascular surgery began to develop. This diverted attention from the needs of the injured. It was early in the recognition of the importance of trauma to our population.

I saw, in 1953, the first cardiopulmonary bypass by cross-circulation. The mother was connected to the child providing its circulation while Walt Lillehei was correcting the Tetralogy of Fallot. Simultaneously, John Lewis was developing and using hypothermia cardiac arrest for correcting SD. It was a very exciting time.

Luchette

You have made many scientific and clinical contributions to the field of surgery and in the treatment of injured patients over your career. Which contributions are you most proud of?

Root

I would have to say peritoneal lavage. That was an idea that we developed at the trauma center in Saint Paul and pursued it in the lab and did some interesting work in peritoneal response to various forms of injury or irritation.

Of course it has been superseded by CT scans for evaluating torso injuries. This has improved out care of injured patients a great deal which has helped us avoid non-therapeutic laparotomy, a disadvantage of DPL.

I think imaging has changed the relative importance of DPL. But it was fun. The pursuit of ideas is always fun and exciting.

Luchette

Most would agree that DPL was a major advance in the evaluation of the severely injured patient, particularly when you didn't have a reliable physical exam. It really changed the practice of trauma surgery.

Root

I think it did at that time. However, in 1973, the use of CT scanning of injured patients was championed by Don Trunkey. This was a major advance.

I guess the DPL was part of the leapfrogging forward in the early recognition of injury. Then of course came the changes in understanding what must be done for the patient… injuries not requiring surgical intervention. The system is not perfect yet.

Luchette

As you look back on your career, is there anything that you were a huge advocate for that today you say it was clearly wrong for patients?

Root

Yes, one area in particular: bleeding from peptic ulcer. Post-stress gastric bleeding was a major issue before the gastric secretory inhibitors and proton pumps were developed. Gastric cooling was developed in the laboratory and applied clinically.

In fact, I wrote my PhD thesis on the influence of gastric cooling on secretory activity of the stomach and production and activity of both pepsin and acid. Along with that, we were studying the influence of temperature on pepsin.

So people who came in with bleeding gastric or duodenal ulcers were treated with gastric cooling, putting a balloon on a long tube down into the stomach and circulating cooling fluid to slow down circulation in the mucosa and with the tamponade effect to stop bleeding. It was moderately successful.

But then Dr. Wangensteen pushed the envelope and decided that maybe with gastric freezing the mucosa could be damaged to the point where it would stop secreting, and that might be a long term solution for peptic ulcer.

That was not a good time in surgery. I wish that I hadn't been so involved with that idea, although some of my colleagues became more involved with the technique.

Unfortunately, it was not done under good, controlled conditions, and lacked monitoring of gastric pressure or temperature. So it was a shoot-from-the-hip kind of thing and not one I look back on fondly.

Luchette

What do you feel are the two or three greatest advances in caring for injured patients in addition to DPL?

Root

I suppose recognition of the mortality of major torso and neurologic injury and recognition that pulmonary contusion and pulmonary injuries are of major importance. Prompt transportation by trained personnel to appropriate trauma centers is one. Detection and attention to early management of the patient in these designated trauma centers has been an advancement.

The evaluation and prompt support of the patient in the ED and appropriate intervention has been a major advance. Understanding the physiology of critical care management has been a major advancement.

The treatment of the patient with pulmonary contusion by ventilator support and appropriate bronchoscopy to minimize the development of VAP has reduced mortality.

The early detection and intervention for life threatening injuries and the better care in the critical care unit have been the major issues. Studying sepsis and appropriate management is still a work in progress.

Luchette

What do you feel are the major changes that improved patient care?

Root

I would divide that into two areas. First, the education and training of surgical and emergency medicine residents to understand and manage injured patients has and is producing practitioners better able to treat injured patients than two decades ago. They expect to be involved and committed in their hospitals to taking calls for trauma.

Second, in the development of a surgical subspecialty of acute care surgery, so that surgeons interested in treating the acutely injured and ill gain recognition and hopefully appropriate compensation for the demands of taking call for trauma.

Luchette

What are your comments regarding hospital-employed physicians' impact on the profession of medicine?

Root

This is a very demanding question and one which I cannot address adequately in short space. However, speaking from a surgical standpoint, I think surgeons are a different breed than other specialists. I think we all enjoy taking care of patients and being busy. I don't think it is going to change the practice patterns of surgeons as much as it may other non-surgical specialists.

From talking to some of my general surgery colleagues, many are not rebelling but rather seem to feel relieved from the complexities and headaches of running their office, their billing, the costs of the ever increasing complex computers and communication systems. Because reimbursement for their services by Medicare and Medicaid is continually threatened by annual regulations, and especially now that we are beginning another roller-coaster ride on Obamacare, most feel relieved with a more predictable fiscal life. Those specialties who enjoy very huge incomes at present—e.g., orthopedic, neurosurgeons, cardiologists, and interventionists—will need to negotiate rigorously to maintain their incomes and thus will rebel at the prospect of being salaried. The potential for reduced productivity by physicians in the absence of income incentives must be monitored by, as I said, surgeons enjoy being busy with patient care so I predict that we can accept being salaried if fairly compensated for our preparation/training and work we do.

Luchette

You have enjoyed many rewards throughout your career, but at the end of the day, what brings you the greatest joys?

Root

In addition to the satisfaction of patient care, one of the satisfying aspects is having a young

person come in as a junior resident and seeing him/her blossom and become passionate about patient care and pursuit of ideas. One of the fun things in my life has been pursuing ideas and uncovering the wrappings of a problem and finding out what is "inside the box."

It's been very rewarding and I look for it in young people who go through the residency and in their senior year have developed into interested and devoted surgeons that are predictably going to do well and patients will do well under their care.

Of course, the other satisfying thing is my participating in the development of the trauma center verification program. It is so satisfying to travel to different centers and witness their starting with some problems in their system, and then coming back in a year and seeing how well they've resolved these issues, and see the accomplishments and the satisfaction and the passion of the trauma center director in having a smooth-running organization.

So, it's been satisfying to think that in the verification program that we've made a difference in the care of the injured. And it's been fun not only to see the program develop but to meet wonderful people all over the country who are interested in trauma care.

Luchette

What are some things that keep you up at night as you watch the evolution of trauma care and acute care surgery?

Root

Well, I suppose realizing that trauma is a totally preventable disease keeps coming back to haunt me. You know, in the middle of the night when I've been struggling in the OR to salvage an injured patient and I think, "My God, we shouldn't be here. This was totally preventable."

And that's what frustrated me over time, to realize that we haven't done enough in trauma prevention. And maybe we can't do any more because it takes education of the public and we haven't done that well enough.

Of course the other is the unsolved issues of the profound effect of prolonged shock on capillary leak, development or multiple organ failure, and final pathway of "sepsis."

It's bothersome and tragic to see a 20-year-old with declining multiple organ function and realizing that the outlook is poor. So those are the things that bother me the most in trauma care.

Luchette

I would like for you to offer the readers some life coach advice on how to balance their careers with their personal lives.

Root

Well, I think we should emphasize that they should get themselves the best possible clinical training they can in a program center, where there is opportunity in acute care surgery and they should seek training with productive research in evidence.

The resident should attach himself to a prominent productive staff member who has

some exciting research projects available.

Getting involved with research, learning research techniques, getting the excitement of pursuing ideas, and developing a passion for some particular direction of their own is something that will be exciting and arouse hidden interests. Finding a mentor in a department is important.

And taking some additional electives such as a rotation in physiology and biochemistry to broaden one's understanding of organ function and the current frontiers of biochemistry and physiology. Perhaps in that way, they can develop their own ideas of attacking the multiple problems such as sepsis.

So getting involved in a good department when there is active and exciting research in progress would be my advice.

Don't try to go through training in record time because you're really there to develop yourself and of course develop your clinical skills. But also to develop your curiosity and your passion for pursuing ideas.

So far as lifestyle, that's a personal and important one. I look back upon my own life and I realize that I wish I had taken more time to travel with the kids and develop their own individual interests.

We did a lot together and had a lot of fun, and we have a close relationship, but I could have done better. So my advice would be: take time for your wife who bears the burden of managing the house and the kids.

It is more difficult for her when you have to move your career from one city to another than it is on you because you go from one group of surgical colleagues to another and your life doesn't change that much, but it does for her. So respect your wife's input and take time for her.

Luchette

What you think are the challenges and opportunities for the future of trauma and acute care surgery?

Root

Well, I think one of the major responsibilities and opportunities we have is to educate the public to take trauma seriously as a major health care issue and a tragic killer of the young.

We must take time to pull together studies of the longitudinal impact of trauma on the lives of the patient and their families. While head injury is the obvious example, injuries change patients forever. It may ruin them totally as productive happy individuals.

Even major fractures like pelvic fractures, long-bone fractures can change the lifestyle and comfort of patients. So I think we need to educate the public so that they will take trauma seriously and, therefore, support our efforts in prevention and developing trauma centers.

Thus, we need to emphasize prevention of injury. Perhaps the public will be willing to accept some limitation on their lifestyle, like texting and driving and drinking and driving, if we educate them to the dangers of both.

We have to continue to stimulate interest in careers in trauma and critical care. And the American College of Surgeons can help in lobbying for adequate compensation for acute care surgeons, recognizing its major importance in the overall healthcare industry.

The development of acute care surgery as a specialty should provide a base for surgeons who are willing to commit to the intensity of acute care. Developing the identity of acute care surgery should provide adequate compensation for the extra efforts required.

Luchette

What do you see as the of trauma and surgical critical care and acute care surgery will look like in 20 years?

Root

Well, I'm not sure. You know you get so imprisoned by current thinking and activities and patterns that it is hard to break the bonds of that. A wish list can help.

I think some better circulatory support immediately in the emergency department would be something that we should be able to develop because it's so commonly utilized for elective cardiac surgery and for people with an acute PE.

So perhaps we can shorten the time when the patient is in shock. Rushing to the operating room is certainly important but sustaining a blood pressure of 90mm during transport and preparation for surgery could be helpful in preventing MOF.

We will develop better support of patients with multiple organ failure. Attempts at circulatory support with ectopic hepatic xenografts have been tried, but need refinement.

All the IL-6, IL-10 and IL-12 issues and TNF have not solved the mystery of sepsis. I predict that the mysteries of sepsis will be clarified through understanding the mechanism of cellular communications.

Trauma prevention should become more effective over the next couple of decades if we do our job right.

Luchette

If there was anything you would change about your professional career, what would it be?

Root

Well, I suppose earlier involvement in surgical critical care, earlier understanding of the pathophysiology of hemorrhagic shock; I should have spent more time on that.

I wish I had spent less time in peptic ulcer studies. The antrum is important, but we spent so much time on that and the vagus nerve interactions that we didn't really have time to do anything else.

For example, I witnessed what happened in the physiology department at the University of Minnesota, where the pacemaker was developed. It was in the physiology lab of Jack Johnson. And then the cardiovascular residents took it over. Vince Gott and others developed it clinically.

I should have spent more time in physiology and gained a broader viewpoint on organ function, and the impact of trauma and circulatory problems.

Luchette

You touched on how you wish you had spent more time with your family, but is there anything else outside the hospital that you would have changed?

Root

I think it really is centralized on taking time for those people who are closest to you and enjoying them with time together.

I have had no political ambitions such as a run for the senate. I can't think of other things other than family and time with them.

Luchette

What are your future plans, clinically, academically, and personally?

Root

Well they are narrowing considerably. The "canyon" is growing narrow at this point. And you know I'd like to spend as much time as I can in departmental functions such as trauma M&M, grand rounds, research conferences, and things like that.

I haven't taken call in the ED for trauma in several years because of my wife and sister. I won't try to do surgery any more, which will be safer for patients. I will miss it.

But maintaining involvement with clinical issues and reviewing research projects and that kind of activity still stimulates me. I think I'd like to do that and mentor residents.

I'd like to publish some of the data that I've accumulated on our trauma site visits and trauma center verification. Now that my sisters and wife are gone and my kids are grown up, I've been thinking about returning to flying.

I've been reviewing the local ski slopes. And I travel some. My grandchildren are almost through college so I've got a little more time for me. And I always enjoyed flying so I might take that up and get my instrument rating.

But I want to maintain primarily my involvement with our department activities and enjoy the productivity of the young people in the department. We have some wonderful young people in our trauma division who are blossoming and I want to be around to see that.

Luchette

Are there any last comment you want to leave for the readership on the 75th anniversary of the AAST that we haven't touched on? Any last closing comments?

Root

Well, trauma is a very important public health issue and it's killing a lot of young people that should have an opportunity in life. So trauma deserves the attention of all of us. And for those

who want to pursue it, it can be a wonderfully exciting life, frustrating, yet satisfying life.

If you can preserve the life of a 20-year-old, you have provided 60 years of life to him or her. So I would certainly encourage them and the development of acute care surgery which may help focus attention on the importance of trauma surgery and other acute care issues.

For the residents, don't consider the money issue as most important and thus aim for the best paid specialty. Go where you heart and interests take you and develop a passion and enjoy it because if it is fun to go to work, then life will be fulfilled.

So don't give up easily. You can have a major influence on people and on their lives. And do the best you can and learn how to manage your time so that you can get the most out of it and yet give time and attention to your family too.