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How did you get interested in surgery, and more specifically, what attracted you to trauma surgery?

DR. C. WILLIAM SCHWAB

Like all the past presidents, I have to frame this by telling you about when I grew up.

My father and uncle served in various roles during the Second World War. My uncle was a very decorated paratrooper, a major actually, in Korea. Thus, I was greatly influenced by this great generation of American patriots.

In medical school during Vietnam, I took the opportunity to join the United States Navy. I matched for a residency at the Naval Hospital in Portsmouth, Virginia, and all of my teachers there had been to Vietnam and served as combat surgeons. There was no doubt in that environment, that trauma and the care of the injured soldier and sailor were the “mission” and center of the universe. It didn’t matter what specialty you were training for, ultimately, your focus was the care of the injured.

We had a very charismatic and inspirational chairman, Dr. Joseph Mullen. Dr. Mullen served as chair for 18 years, and many of his “chief residents” are well known trauma surgeons—Joe Tepas and Mike Hawkens, to name just two. He was prominent in academic surgery and a well-traveled visiting professor. Many of his articles and lectures were about trauma care and systems. Subsequently, when he became the vice chairman of surgery at East-

ern Virginia Medical School, he recruited me to establish the trauma center and first medical helicopter program in Virginia.

There was no better mentor and no better role model than Joe Mullen. I recently went back for and spoke at his 80th birthday. In a nutshell, it was growing up in the post-World War II years and the influence of some great men and mentors.

LUCHETTE

So it was the patriotism aura that drove you toward the military and then into surgery?

SCHWAB

At the age of 6 years, I was struck by a car while riding my bike. I had a leg injury, which is now called a mangled extremity. I was taken to a hospital in Amsterdam, New York, where there was a very gifted orthopedic surgeon named John Ferguson, who, interestingly, Mike Sise knows from living in that small upstate town in New York. Dr. Ferguson did several operations over a nine-month period on my left foreleg, so perhaps this changed RNA and emotionally drove me toward medicine and trauma surgery.

LUCHETTE

Who are other mentors in your career that you feel were instrumental in guiding you into the success that you've enjoyed.

SCHWAB

I must admit Dr. Mullen, who I just discussed, will always be my mentor who shaped me as a physician and surgeon.

When I came to Penn, Clyde Barker, who is perhaps one of the utmost surgical scientists and academic chiefs in American surgery, became my mentor and my professional coach. I had come from places which weren't necessarily heavy academic departments, and I needed a general manager and a coach for improving my scholastic focus. He was strong, direct and constructive during the first few years at Penn.

Of all the people that I could have pictures on my wall, there are three mentors—it's Drs. Joe Mullen and Clyde Barker. The third key person is Don Trunkey. Don has been a friend for 30 years. We just hit it off early-on. He took a liking to me—I don't know why—and has always been a tremendous friend and guide for my career.

LUCHETTE

Well, how did Dr. Rhoads feel about your choice of trauma surgery? There were a lot of specialties coming into light at the same time as trauma.

SCHWAB

Dr. Rhoads, like Dr. Barker, was very supportive of the trauma movement in America, at Penn and of me personally.

If you go back to I.S. Ravdin, and especially 1940 to 1976 (I just did 50 years of surgical history at Penn), Ravdin, Rhoads, and Bill Fitts had great influence on the care of the injured here.

Ravdin was very interested in resuscitation and took the 344th Army Hospital to Burma. Buried within the ranks of surgeons, Bill Fitts and Bill Scheie, who founded the Scheie Eye Institute, Clet Schwegman, a gifted general surgeon who in Burma became the neurosurgeon for the hospital, went on after the war to become very prominent surgeons. The war experience focused mainly on injury, and upon returning to Philadelphia, stimulated a thirty-year effort to modernize trauma care and systems. Fitts wrote about this extensively.

Dr. Rhoads was very interested in the organization of trauma in the nation. Rhoads became the Chairman at Penn about 1959 and in 1960, he decided that Dr. Fitts was going to be the trauma guru at the Philadelphia General Hospital and for the Department of Surgery. He supported Bill Fitts becoming the third editor-in-chief of the *Journal of Trauma*, and Dr. Rhoads put his efforts into founding the American Trauma Society.

Dr. Rhoads was very supportive of the work of the Committee on Trauma and the AAST. He shared my view that academic medical centers (like the University of Pennsylvania) should be committed to injury and trauma care. I think of Dr. Rhoads because of his fondness for Fitts and respect for Ravdin having the Trauma Center accredited at Penn was a fulfillment of a lifetime goal.

LUCHETTE

Which of your scientific contributions are you most proud of and how do you feel it influenced the field of trauma care?

SCHWAB

I'm most proud of the damage control concept we published with Mike Rotondo, Don Kauder and the team that was here in the early '90s (*J Trauma*. 1993 Sep;35(3):375–82). Packing the abdomen or liver, even the pelvis, was an old concept. Mike and the team developed and explained the broader and important approach—the damage control trilogy.

Surgeons have documented the effectiveness of packing to control bleeding since antiquity. Harlon Stone published a series in which packing worked with penetrating injury to the abdomen. Our paper sequenced operative control of bleeding and contamination with an ICU recovery phase that was necessary to stabilize physiology and, last, a delayed definitive operation to reconstruct viscera two or three days later. Our study was small, but the outcomes impressive, even to us!

The second most influential aspect of the program at Penn are the training programs. We are now in excess, if you include all disciplines, of 115 trauma/critical care fellows, about 90 of which are surgeons. Forty are in leadership positions throughout the world. Personally, this contribution is the most significant of my career. I'm very proud of that.

LUCHETTE

When you look back over your 30-plus-year career, is there anything that you really championed and that you say today, “That was probably not a good thing to advocate”?

SCHWAB

There are two things that I was passionate about that were total busts. One was MAST trousers and the other was needle catheter jejunostomy under local anesthesia (with sedation) in the ICU!

The MAST trousers journey was an important lesson for me in my academic career. What I learned is that before advocating, make sure the science and evidence supports your dialogue. Neither of these interventions turned out to be necessary or effective; in retrospect, I was not prepared to write about them objectively.

LUCHETTE

What do you think are the two or three greatest advances in trauma care and science that occurred during your career?

SCHWAB

I would have to say imaging, critical care, and trauma systems. Certainly, trauma systems—assuring access, demanding quality, and insisting on performance improvement—and imaging have revolutionized the care for the injured patient. The third is critical care. This is the infrastructure and “unsung hero” of the trauma system. Dedicated ICUs, intensivists focused on physiology, immune modulation and total organ support are as much a reason for improved survival as any other component of the system.

From a basic science view, the understanding of the biology of the immunologic response to injury, infection and sepsis, which has been a difficult and long journey, has had profound effect on the management of our critically ill and continues to be a fascinating journey.

LUCHETTE

What do you consider the two or three significant changes in practice patterns that have occurred during your career?

SCHWAB

In the 1980s, Brent Eastman, Frank Lewis, and others worked to change what had been described as “exclusive” trauma system to an *inclusive* trauma system. This concept strove to reverse the prevalent feeling of the day that only a Level I or II trauma center could take care of the “trauma” patient. By being inclusive, the system began to embrace all hospitals that committed to care for the injured. This change in approach slowly reversed a polarized situation and eventually was key in expanding the trauma center concept.

I think the development of the critical care intensivist has definitely changed and enhanced our specialty, broadened our practice base, increased our value as specialists, and

improved survival.

And then lastly, I believe the redevelopment of the emergency surgeon known as the “acute care surgeon” is changing how we will practice in the future. The scope and impact of our redesigned specialty provides a tremendous asset for the needs of patients in the next few decades. At the same time, there is a genuine risk that the demand for 24/7/365 emergency surgery, with large volumes of challenging cases, may dwarf or shadow the passion for trauma surgery. This, over a long time, may extinguish the development of the academic trauma surgeon.

But those three things: the move by the College to go to from an exclusive to an inclusive trauma system, the development of the surgical intensivist, and the emergence of the emergency surgeon are the three practice pattern changes that have changed my career.

LUCHETTE

At the time that the College was going to an inclusive system, where was the Pennsylvania Trauma System Foundation [PTSF] developmentally? Share with me how that was developing in parallel with the College’s model and your role in the PTSF.

SCHWAB

In the mid-to-late 1980s, key people developing the Pennsylvania Trauma System were Charlie Wolfert, Frank Ehrlich, Carol Forester-Staz, and Jim Redmond. At the same time, the activity of the College (COT); CDC (Mark Rosenberg) and HHS/HRSA (Judy Braslow) was influencing state departments of health, EMS agencies and trauma surgeons. Pennsylvania created an “exclusive” system, but they approached it inclusively. In Pennsylvania, there was no limitation to the number of Level I or Level II trauma centers. With the department of health and the Pennsylvania Hospital Association, the above leaders created the PTSF. A public process of information and distribution of an RFP to every hospital in the state followed and encouraged each to consider being a Level I or II trauma center. What the PTSF founders did was set the standards so high and the verification process so comprehensive, that it eliminated many hospitals that choose not to participate. It wasn’t a perfect process but served well to avoid any criticism by those who choose to not seek verification.

The PTSF and the Commonwealth of Pennsylvania should be credited with creating an effective and durable trauma system that is, in my estimation, a premier model of community and government partnership.

LUCHETTE

What aspects of your career that you find to be the most rewarding and bring you the greatest joy?

SCHWAB

There are three words that I put down for this answer: teaching, mentoring, and my professional colleagues here at Penn and especially at the AAST and EAST.

I used to dream as a kid that I was a college professor. I thought I would teach history. For my soul, teaching others is the most rewarding aspects of my career. Second, mentoring gifted and dedicated fellows is a special privilege that I have had. And third, my relationships and fondness for my professional colleagues, the people who do the same work I do, is absolutely a joy.

LUCHETTE

Now I want to hear about what aspects of healthcare keep you up at night.

SCHWAB

So 25 years at Penn and the biggest thing that I really was challenged with was to protect, defend, and grow the academic division, trauma center, and intensivist model. And the battles were always about money. The attitudes that come from the ever-increasing corporate mentality is very discouraging. In the face of that, I had to find ways to grow while caring for people of little means. It was really, without a doubt, the biggest challenge I had and it took a toll. Every two years, I had to justify why the trauma center was not profitable. It was distressing that so much energy was taken to continually change peoples' attitudes, that some aspects of medicine don't yield high margins. In retrospect, as I think of these "battles," it exhausts me.

LUCHETTE

What is your advice to the next generation of academic trauma and acute care surgeons?

SCHWAB

Most of our fellows will enter an academic position, so if they are going to be successful, they must publish. But as important, they must be able to operate. I tell them: "Don't let anybody tell you you can't or you shouldn't be in the OR. Don't ever subordinate the operating room to other duties. Be in the operating room as much as possible and take on the most challenging cases." Second, I emphasize the need to actively seek more senior surgical partners. They should ask those senior partners and mentors for help with difficult cases, in and out of the operating room, because these "senior moments" are so invaluable.

A lesson that I think most young surgeons haven't learned is to study the history of the topic you are addressing. It is as informative as the information within the current journal articles. History teaches how others before you (and with great success), analyzed and solved problems. This important step helped frame the present work and many times alters the idea you thought was so novel.

LUCHETTE

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

SCHWAB

I believe the AAST is the foremost scholastic trauma organization in the world. It owns the most respected journal in the field. Since inception, it has been a group of committed thought leaders about all aspects of trauma. Thought leaders with scholarly pursuits in the laboratory, in the hospital, and recently, as epidemiologists and translational scientists. Thought leaders in systems and outcomes. And thought leaders in leadership.

If you review presidential addresses of the AAST, these orations were not so much about the AAST, but focused on what the world needed to better the outcome of the injured patient. It is the injured patient that has been our passion, our mission and our quest.

My worry is that we lose the focus on trauma as we become emergency general surgeons. If we morph into an emergency surgical society with trauma as a subordinate, I'm very worried that this will change the essence of the AAST and diminish what still needs to be done—lowering the burden of injury. With one-third of the world's countries still struggling with primitive injury care, our work is far from over.

LUCHETTE

What do you see as the changes in the practice of trauma and critical care in the next 20 years?

SCHWAB

I believe there is going to be continued diminution of money in the government for health care. This will force the regionalization of emergency and critical care. Within the fringe counties of Philadelphia, we have 40-plus hospitals that have emergency departments and critical care units. They are all staffed and operate 24 hours a day. If you were to say that we need more than 10–12 hospitals that were staffed to provide 24-hour emergency and critical care for +16 million people who live in this region, this would greatly eliminate costs, duplication of services and the dilution of provider experience. From a financial perspective alone, we can no longer afford having 40 emergency departments, 40 intensive care units, and paying for on-call coverage within sight of each other.

I believe developing criteria for who needs to be seen urgently versus emergently (and requiring these centralized centers, like trauma and pediatric) must happen. I think it is going to take a decade, but regionalization of emergency is necessary and will reset the paradigm of all emergency care

LUCHETTE

Tell us about one or two things that you would change in your professional career if you had the chance?

SCHWAB

I would change the way other doctors in our profession value what we provide as trauma surgeons and intensivists. I think the value system in medicine has become very artificial. It is

based on cash flow and bringing profit to medical centers. I wish that others would respect the care of the injured as the basis of medicine and the foundation of surgery. Having said that, I would not change my career, and I would not change the opportunities that the profession of medicine has given.

LUCHETTE

Well, if there isn't anything you would change in your professional career, what about your personal life outside the hospital?

SCHWAB

I think the one thing I would do is take *more* vacations and not combine work and vacation. In other words, I would have learned earlier to divorce my professional responsibilities from my family life. And that would have led me to part two of the answer: I would have created a "family home" earlier in my career. We bought a gorgeous piece of property in Upstate New York on the Finger Lakes (near our childhood homes), built a house to hold all the kids and the grandkids. I should have done that earlier, Fred. I have always been hyper-focused at work, and luckily, a wonderful wife and children that deserved more quality time with me.

LUCHETTE

What are your plans for the next 10–15 years academically, clinically, or personally?

SCHWAB

First, I'm going to remember to try to come to work! For the next three to four years I am going to complete my ultimate dream here, which is to build a new trauma center eight blocks away at the Penn Presbyterian Hospital, one of Penn's three hospitals. The building, known as the Acute Care Pavilion, is part of a larger strategic building plan that encompasses the Penn Medicine campuses and clinical practices.

Step one is moving the Level I trauma center and trauma program to this new pavilion. We have been able to design a very contemporary trauma center within the 178,000 square-foot pavilion that is comprehensive with state of the art technology. This project is one that I envisioned years ago and recently got the green light.

I continue to work clinically every month and enjoy the challenges, and of course, the teaching more than ever. Once the new trauma center is completed, we will just see.

LUCHETTE

Are there any other comments you want to make about anything we haven't cover on the 75th anniversary of the AAST?

SCHWAB

My parting thought returns to not losing the history and core mission of the AAST. We create thought leaders and our purpose has been advancing injury care. I hope that always remains

as central to AAST. I have had many privileges and honors and, perhaps training in the United States Navy was the greatest privilege, but being a president of the AAST has been one of the greatest of honors.