

# How Many Lives Did You Save Today?

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Approximately 10 years ago I had a particularly difficult 48 hours. I was on call one evening and ended up doing an adult cardiac transplant. Shortly thereafter an acute aortic dissection came in. Fortunately, the repair went well. I ended up doing my elective cases scheduled the next day including an infant arterial switch, and some adult cardiac surgical cases. As I was preparing to come home, an infant heart became available for an extremely ill child who was in the pediatric intensive care unit with end stage cardiomyopathy. I ended up doing that transplant as well.

Finally I stumbled home that Saturday morning. It had been a particularly difficult time period. We had trouble arranging for intensive care unit beds. The operating room was packed, and it was difficult to get cases done. To say the least, I was troubled and tired of the hospital. I wandered through my doors at home and my youngest son, who at that time was age 7, caught me by the sleeve. He said "Dad, how many lives did you save today?" I began to think about it, and realized at least four actually. The two transplant recipients, the infant for the arterial switch, and the patient with the Type A aortic dissection would not have survived without the surgeries that I was privileged to do. Suddenly my troubles that day disappeared. It was an honor to be able to offer these patients' families new life for their loved ones. Who else gets the opportunity to do that? I had forgotten what I used to say as a resident. "They actually are going to pay us for doing this." Obviously it comes at a high cost to us, and our families. The hours are extensive, the educational process is incredibly long, and patients' mortality and morbidity weigh heavily upon us. The majority of thoracic surgeons I know carry these grave issues heavily on their conscience.

Clearly what we do is important and we must continue this field in some way, shape or form.

## Obstacles

Cardiothoracic surgery has huge issues. Reimbursement continues to go down. Coronary artery bypass case numbers continue to go down. Whether we like it or not, angioplasty and stent placement provide alternatives for patients. Since the decisions regarding surgery are initiated by cardiologists, they get the first crack at coronary therapy. The reduction in the number of cases available

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has resulted in fewer jobs for cardiac surgeons. This lack of jobs has been amplified by the failure of many of the senior surgeons to retire. Fortunately, general thoracic surgical jobs continue to be available, and more residents are being educated and directed towards general thoracic surgery.

Thoracic surgical training has also been severely impacted. Certainly, the 80-hour work week has reduced the educational opportunities for many of our residents. There is a lot of good to be said about residents being able to spend more time with their families, but this has changed the way we educate the residents. Program directors continue to turn over. As an example, twenty-five percent of program directors changed in 2003. This is among the highest of any ACGME-approved residency programs. If a thoracic surgical program fails to prosper then the simple solution for a Dean or Chair of the department is to fire the program director and start again.

Such turnover is obviously not conducive to good resident training. More importantly, the residents are not happy. Many programs treat the residents as apprentices. The lack of jobs after lengthy training is discouraging. Twenty-five percent of thoracic surgical residents have said

they would not do it again if they had to do it over. This has translated into the disaster with the thoracic surgery match this year. One hundred and thirty-nine thoracic surgical spots were offered, and thirty-nine positions were left unfilled. Anyone who applied for thoracic surgical training could get it.

Finally, research in cardiothoracic surgery is at an all time low. To the best of my knowledge, there are only forty cardiothoracic surgeons with NIH funding. This is likely to continue to decline as the NIH funding levels get lower each year. NHLBI is presently funding at somewhere between the 12th and 15th percentile. Our specialty will stagnate without the creation of new knowledge.

### Why Become a Thoracic Surgeon?

I have tried to get at why people are motivated to go into thoracic surgery. I polled all the previous presidents of this organization and asked them two questions: Why did they choose cardiothoracic surgery, and would they do again? Fifteen replied to these questions. For the majority, the reasons for cardiothoracic surgery related to the excitement and the future. Let me quote selectively from some of the respondents. For instance Francis Robicsek stated: "I guess it was the Matterhorn complex." Hal Urschel replied "I chose CT surgery because that was the most exciting of all adventures; what else was there?" Gus Mavroudis stated: "I liked what I saw and I was highly influenced by *Life* and *Look* magazines which cataloged the advances from Johns Hopkins, and the new stuff from Minnesota, and later Houston concerning open heart surgery. It was a one track mind after I saw this." Richard McElvien noted: "Why? Early exposure during surgical residency peaked my interest. One patient in particular stands out. He was brought to the ER with a stab wound of the chest on a night with the city shut down because of snow. He died. I opened his chest bare-handed and found a wound of the right ventricle, I put my finger in the hole, and he woke up with the release of his tamponade. I stitched his wound with no anesthesia. Then he fibrillated. Our homemade defibrillator did not work. I took the paddles and connected to a lamp cord and a fellow resident plugged it in briefly. It worked and we both survived." Richard Clark wrote: "I found the excitement generated by Drs Muller and Littlefield to be palpable as they each ventured into untested areas. There was a sense of adventure, and an atmosphere that it was laudable to be in a high risk, high-reward branch of surgery." As these excerpts suggest, most of these surgical leaders were excited by the field, and by the chance to truly help individual patients.

The second question I asked was whether they would do it again. Each would. Robicsek, when asked whether he would go into cardiac surgery again, stated: "Sure, why not? It may not be as fun as it used to be, but neither is anything else." Hal Urschel stated: "Again, again, again, and again." The bottom line is that we all are fortunate to be part of an exciting field that is clearly worth preserving.

### Causes of the Crisis

Our peak and our valley relates to one procedure: coronary artery bypass grafting. Most of the individuals who answered my questionnaire came up in the days when cardiac surgery was difficult, exciting, and truly earth-shaking. Coronary bypass surgery made it a business and it became too easy. Suddenly a huge group of patients were referred for surgery. The reimbursement primarily medicare, for the surgeon and hospital were excellent. These patients were worked up, tuned up, and even cared for by cardiologists. Surgeons could do four to six cases a week, go home at four in the afternoon, and make a substantial living. Even poorly trained residents received job offers to cover angioplasty and start new heart programs.

Coronary bypass surgery took over our entire field. We began to discuss what type of cardioplegia we should use, whether arterial grafts were better than vein grafts (they were), and finally whether we should perform the procedure on pump, or off. We stopped asking truly scientific questions but rather spent a lot of time fine-tuning minor technical points. Coronary bypass surgery took us away from other areas of interest. We put general thoracic surgical cases late in the day. Fortunately, a few pioneer general thoracic surgeons began to realize how important this discipline was and continued to develop it. While we were "laying pipe," they were developing lung transplantation, thoracoscopic surgery, lung volume reduction, and better surgery for lung, and esophageal carcinoma. In addition, they became the primary care physicians for general thoracic surgery. They saw the patients initially, made the diagnosis, and determined what therapy would be required. As cardiac surgeons we frequently became just technicians. We stopped being doctors. We put distance between ourselves and the patients as well as all referring physicians other than cardiologists. We began to give up other areas that did not interest us as much, or were not quite as financially rewarding. We quickly gave up peripheral vascular surgery. This endeavor was time-consuming, requiring a great deal of patient interaction. I wrote an editorial several years ago about the importance of maintaining our interest in vascular surgery [1]. At one time we played a major role in the development of this discipline. Unfortunately, there are now only a few academic centers where thoracic surgeons (with vascular training) play a dominant role in peripheral vascular surgery. We gave up pacemakers, defibrillators, and most aspects of arrhythmia surgery. We obviously are trying to regain this with a focus on atrial fibrillation ablation. However, we are dependent on electro-physiologists to refer these patients to us. Ironically, the pathophysiology of this arrhythmia was worked out by Jim Cox, a surgeon and STSA member.

Unfortunately, this reduction in coronary bypass surgery reduced resident interest in cardiac surgery due to reduced availability of jobs. I continue to applaud the general thoracic surgeons for making their field as exciting as it is today. My impression was in this match half

the individuals who applied were interested in general thoracic surgery.

## Solutions

It is not over yet. Many excellent people are actively working to reinfuse life into cardiothoracic surgery. However, I am not sure I agree with all the solutions. Many have suggested that cardiac surgeons need to become expert in percutaneous interventions. Others have suggested that surgeons should be trained to perform coronary angioplasty, and almost be cross-trained as cardiologists. I certainly agree that we need to be involved in percutaneous valve therapy as well as thoracic aortic stenting. I am not sure coronary angioplasty has a role for the average cardiac surgeon. It is very difficult to get this skill set in training programs. Second, who is going to refer you a patient for coronary angioplasty? If you are competing with the cardiologist for these patients, then the cardiologist will not send the valve cases. It has been stated that vascular surgery has been improved by their involvement in endovascular surgery. Certainly, this is partially true. However, remember that vascular surgeons tend to be the primary care physicians for vascular patients and therefore can determine therapy.

A huge part of vascular surgery is now endovascular surgery. In many programs open surgery on the aorta has become a thing of the past. Unfortunately, this has not necessarily helped vascular surgery. In this past year's match there were 117 positions offered, and 24 open slots were available at the end of the match. That is anyone who applied in vascular surgery could get a position. There are plenty of vascular jobs available but residents are not necessarily interested in this discipline. Why is that? Most residents do not want to end up essentially as interventional radiologists. This is witnessed by the interventional radiology match, which filled only 70 of 189 slots at the end of the match. Sixty-two percent of the positions were left unfilled.

The bottom line is that we have to continue to offer exciting therapies. Aortic disease and valvular heart disease should be our bailiwick. We should become the primary or at least the secondary physicians for these two disease processes. Of course we should work with the cardiologists because they are a great help but we should not distance ourselves from these patients. No matter what technology is available, if you do not see the patient first, then you do not have the option of using that technology. Clearly thoracic surgeons of the future must be trained in endovascular therapy but we should not abandon the open operations that only we can do. One of the issues for vascular surgery is many of the residents are no longer being trained in complex aortic surgery. There is a true joy to have the ability to do such cases and

make a difference for our patients. We must be more involved in both clinical and translational research. Without this, we cannot continue to develop our specialty and improve patient care. Cardiothoracic surgery will stagnate and wither away without new knowledge.

Most importantly, we must offer excellent training for our residents. We must teach them to be both technically excellent as well as to be thoughtful physicians. The poorly trained surgeon will not be able to compete in the future.

## Summary

So is there hope? Although there was a shortage of residents applying for *Thoracic Surgery*, the top 25 to 30 this year were as good as any other year. They share with the members of this organization the same sense of excitement. They are in it for the right reasons. They want to care for patients and to learn the technical mastery to do so. We need to continue to provide them with the education that they deserve. As Dr Shumway said "the hardest part about heart surgery is getting to do it." If we are to teach high-caliber residents, then we must truly teach them to operate. They cannot learn just by watching. If they know they are going to come to a program and get to do some of the cases, they are going to be motivated to enter that program. We must continue to develop the research about the disease conditions that interests us and continue to develop new operations.

The AAMC predicts a severe shortage of specialists in the future. The baby boomers continue to grow older. A generation of elder cardiothoracic surgeons will retire over the next few years. My suspicion is that there will be a shortage of cardiothoracic surgeons in the near future. The problem is that it will take several years to turn this around. I have noticed that the various thoracic surgical organizations have recently had separate retreats to discuss the future of thoracic surgery. It is a noble goal to improve your own organization you are a part of; however, I think that it is time for a general retreat on the future of cardiothoracic surgery. It is time for the leaders of all these organizations to come together to discuss our future, as well as how we solve the problems of today. We need to identify the future leaders of our field and mentor them properly. Finally, we have to remember we are Doctors first and technicians second.

It is only by planning the future of our field that we will be able to continue to answer with pride and joy my son's question: How many lives will you save tomorrow?

## Reference

1. Kron IL. General vascular surgery and the thoracic surgeon. *Ann Thorac Surg* 1986;41:471-2.