STATE OF THE HEART

The Practical Guide to Your Heart and Heart Surgery

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with
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In Remembrance

C. Walton Lillehei, M.D., Ph.D.
October 23, 1918–July 5, 1999
Heart Surgery Pioneer

"I would like to think that
I've left the world of cardiovascular surgery
better than when I found it.
That would be a suitable epitaph."

— C. Walton Lillehei, 1995

Notice to Readers

The practice of medicine, medical science and medical research is rapidly changing, especially as it relates to the heart. Information resulting from medical research, clinical experience and specific circumstances as well as opinions of authorities that may differ require that the reader use judgement and other sources when making any decision based upon the content of *State of the Heart*.

The publisher and authors have made every effort to ensure that the information contained in *State of the Heart* is complete, accurate and in accord with medical standards at the time of publication. However, neither the publisher, authors nor any other contributor to this publication can warrant, especially in light of the rapid changes in medical science, that the material contained is in all respects accurate and complete and they do not take any responsbility for any use or misuse of the information contained herein.

The reader is therefore advised to discuss the information contained in *State of the Heart* with medical authorities and to confirm any information with other available sources.

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Reader's Tip: The  icon denotes a section that is of historical significance in the development of heart surgery.

Foreword

BY

C. Everett Koop, M.D.

FORMER SURGEON GENERAL OF THE UNITED STATES

I KNEW I WANTED TO BE A DOCtor when I was five. I knew I wanted to be a surgeon when I was six. At the time, pediatric surgeons didn't exist — so I couldn't say I envisioned working with children and their families. Later, during my training, I wish I could say I had the great foresight to recognize that pediatrics was the field needing the most help. But that's not the case.

In 1946, I had my mind set to move into the field of cancer surgery when my chief, Doctor I.S. Ravdin, who was professor and chairman of surgery at the University of Pennsylvania and had been a brigadier general in the U.S. Army Medical Corps during World War II, asked me if I'd like to be surgeon-in-chief of the Children's Hospital of Philadelphia. I accepted the job and the requisites that came with it. It required me to go to Boston Children's Hospital for training and to give up the practice of adult surgery. Finally, he told me that I had to devote my attention to developing the country's finest academic training program for child surgery.

When I set out to create this training program, there was no true competition. The closest thing was the program in Boston run by Dr. William E. Ladd, under whom I was supposed to train. Ladd, however, retired just before I moved to Boston and had no immediate successor. As a result, I spent about seven months working with Dr. Robert E. Gross.

I learned several important lessons right away. I learned that children cannot be treated as small adults. They have a different tolerance for surgery, and dealing with their families is a completely different matter from dealing with adults.

I also saw that many of the mortal congenital defects at that time were basically untreatable. These defects — conditions like abdominal organs outside the body in the umbilical cord, or a hole in the diaphragm and all the internal abdominal organs up in the chest where a healthy lung should have developed — often had mortality rates as high as 95 percent in 1946. It was not at all uncommon to have a two-and-a-half–pound or three pound youngster brought to the hospital with one of these defects.

We made our contribution to pediatric surgery very quickly. We went from a 95 percent mortality rate in 1946 to a 95 percent survival rate for many of the most serious conditions in about a decade. I've always considered this a remarkable accomplishment for a bunch of doctors in a new specialty.

Cardiac surgery has followed a similar upward path. Just like pediatric surgery, open heart surgery was a thing of the future in the 1940s. There were only a few cardiac surgical procedures available: ligation of the patent ductus arteriosus, repair of coarctation of the aorta, and atrial wells to aid in the repair of an interatrial septal defect, but many doctors thought cardiac conditions were surgically untreatable.

Within a few years, just as my pediatric practice was gaining momentum, the heart-lung machine progressed to the point where open heart surgery became possible. In fact, at about that time I built a heart-lung machine that we used successfully in the laboratory with $6,000 of my own money. I had to make a decision at that time. I had an extraordinarily busy practice — for some time, I was the only pediatric surgeon south of Boston and east of Chicago. I had to decide whether I was going to continue what I was doing in pediatric surgery and add open heart surgery or whether I would just do the cardiac surgery. I didn't believe I could do both and do them well. I felt that I should continue doing what I was doing.

Since then, the field of cardiac surgery has been up there with the greatest strides in modern medicine. Every portion of the heart can be reached, and almost any conceivable operation has already been done. It's been a very exciting time, especially when heart transplantation came along. Consider all the things that can be done today, especially on newborns where we can even correct certain defects in utero.

Some problems we haven't thoroughly corrected are related to the heart's electrical system, but that will come. The research with angiogenesis, which deals with growing new blood vessels in the heart, is another frontier yet to be conquered. People say, "Oh, you can't fiddle around with those." Well, of course they say that, but they said that 10 years ago about other things. I've learned that you never say, "That's not going to happen."

Many of the other hurdles we face in medicine are not actual treatment hurdles but due to society and the changing nature of medical care. Transplantation, for instance, is a viable option for thousands of patients, yet that surgery is underutilized. We need to improve the organ donation program in this country. We've got to change our basic approach and reverse our thinking in this matter. Currently, we assume that no one wants their organs given for transplantation unless they had said so before their death. In France, doctors assume everybody wants to donate organs unless they specifically object. I'm sure there are some people there who don't want their organs taken but never get around to saying no — and some of these people may have their organs taken.

But even with this unfortunate consequence, lives are saved. It's terrible to be in a children's hospital and see the kind of emotional stress that develops. Two parents will be waiting for a liver, and in comes a child who doctors don't think is going to live. They question how soon the child is going to die, and which one of the kids is going to get the liver. The enmities and the hostilities are terrible. Doctors feel defeated by death, and many surgeons are not anxious to talk to those families about organ donation.

Hospitals that have gone to a donor program, with a special health educator acting as the organ procurement specialist probably do better. It's too hard for doctors to face the fact that in order to have one patient survive, they've got to lose another. That's part of the reason I think it ought to be taken out of doctors' hands and put in a donor specialist's.

A federal donor program would help tremendously with organ procurement. As surgeon general, I thought we were on the way to developing one. It was an uphill issue on a national level because doctors usually want donated organs to stay in their area and object to a heart, for instance, traveling across the country to benefit another patient. We sponsored workshops on organ donation and transplantation and brought people in from all over the world who taught us a great deal. We also funded the start-up of the ACT, the American Council on Transplantation, which helped us come to grips with trading organs from one procurement agency in Richmond to another in Florida and so forth.

I think public awareness may be the problem. I never fail to compliment the press on the fact that when AIDS came along, a most complicated disease, they kept it in the headlines for eight years and made it understandable to the average person. If we had that kind of effort for transplantation, I think we would get state laws that said if you die in an accident, your organs are available for transplantation unless you specifically object or carry a warrant on you that says, "Do not take my organs."

In greater society, I am also concerned about the way medical care is delivered. The old system is changing, and I'm concerned that my great grandchildren won't have as good pediatric surgical care, for example, as my grandchildren. That may sound strange, but the same may apply for cardiovascular surgery.

It takes a lot of practice and experience to become adept at dealing with a three-pound baby and get a survivor. We may be training too many pediatric surgeons and pediatric surgical specialists, thus not allowing doctors to develop their expertise in a greater volume of cases. In the most complicated operations, there is a danger of producing so many surgeons that they will never get enough experience to become as adept as the Denton Cooleys, John Kirklins and the Michael DeBakeys.

I've been fortunate enough to have experienced a very exciting period in medicine through my career, and have served as Surgeon General of the United States for eight years. Undoubtedly, in the future, many of the things that people are excited about now, like minimally invasive medicine, will be tested. In the operating rooms, doctors will successfully attack even more complicated conditions. Over the years, I've learned to think that almost anything is possible.

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