ALL WE DO NOT KNOW

By Robert M. Sade, MD

I stood about six feet from the radiant warming bed, behind the nurses and residents who were crowded around, each playing a role in the drama reenacted from time to time in this intensive care unit. They were resuscitating a neonate in cardiopulmonary arrest. An anesthesiology resident was at the head of the bed, manually stabilizing the endotracheal tube that she had just repositioned. A cardiothoracic resident was holding the baby around the chest, his fingers in back of the thorax, his thumbs resting gently in the middle of the sternum, rhythmically compressing it in an attempt to maintain circulation. An ICU nurse was delivering the umpteenth round of bicarb, epinephrine, and glucose, while another nurse stood behind her, in front of the emergency cart, readying the next round of resuscitation drugs. I had lost count of how many rounds had been administered. Glancing at the clock above the bed, I rapidly calculated that the lapsed time had been about 50 minutes from the moment of arrest.

I had operated on the baby earlier on the preceding morning, doing a Gore-Tex modified Blalock-Taussig shunt for pulmonary atresia. The operation went well initially, but the pulmonary anastomosis had clotted, requiring reoperation and eventually a classical Blalock-Taussig shunt on the other side. She had been somewhat unstable for a few hours following the reoperation, but then leveled off and seemed to be doing nicely during the evening. Then, at 1:02 in the morning, her heart fibrillated. I received a telephone call at home shortly after the arrest, and fifteen minutes later, was in the ICU. As the resuscitation continued, I recalled every detail of the operation and the postoperative course, and explored every avenue of speculation and fact that could be extracted from the left and right brains of the physicians, nurses, and technicians in the room, as well as my own. We did everything we could, but, still, the EKG pattern of flat line interrupted by periods of ventricular fibrillation continued.

The intensity and frenetic activity in the room were waning as it became progressively clearer to each of us that this resuscitation was going nowhere. We probably should have quit after the first 30 minutes, 45 at most, but the trust that was clearly evident in this beautiful little girl’s parents a few hours before urged me to keep going. Sixty-two minutes into the resuscitation, perhaps the most persistent, longest, and completely unsuccessful resuscitation I have ever attempted, I stepped back from the bed and announced in a voice made hoarse by a certain tightness in my throat, “OK, that’s it. Please note the time; I’m pronouncing her at 2:04 A.M.” and, turning to my family liaison nurse, asked, “Vickie, is the family in the lounge? I need to talk with them.”

During my career in cardiac surgery, I had many moments of triumph and not a few of disaster. I suppose that many of the procedures I did could be called routine, but I never felt that way about any of them. I often learned something important and valuable during the most ordinary operations and, like Sky Masterson, could never be sure when Lady Luck would slip out of the room, leaving me in the lurch. For me, a major attraction of cardiothoracic surgery is the broad body of knowledge and the finely honed skills required.
to navigate successfully through widely ranging combinations of abnormal physiology and distorted anatomy. Together, these create intellectual and physical challenges that provoke both positive and negative emotional intensity, carefully concealed beneath a polished veneer of unflappable calm and equanimity.

Another attraction of cardiothoracic surgery is the feeling of warmth and satisfaction that arise from expressions of gratitude from patients and families, particularly when they come in the form of unexpected reminders from the past. I received a letter from the mother of a former patient a few days ago. Attached to it was a photograph of an attractive young woman in her early 20s with a broad smile that engaged every muscle of her face, especially the corners of her upturned mouth and narrowed, twinkling eyes, framed by brown shoulder-length hair. She was dressed in an academic gown. The note said, in part: “I thought you might like to see some of the long term results of your work. These pictures were taken at Lisa’s graduation from college a few weeks ago. She double-majored in psychology and communication and is trying to decide on graduate school, so I think some of our fears of 1983 can be put to rest.”

It is always nice, of course, to hear a voice from the past recalling a successful outcome, but this one was a special case. The bright, intelligent, and happily smiling eyes looking from the photograph straight into my eyes were those of the infant girl, now grown, whom I had pronounced dead early one morning, 22 years before.

As I stepped back from the radiant warmer and turned to leave the ICU, my eyes were beginning to become moist as I took a last glance at the EKG monitor, which was about to be disconnected; it showed the same flat line as it had during most of the resuscitation. Then, the slow, sad process of cleaning up the bed and the surrounding space was interrupted by a solitary “beep”. Our eyes turned toward the source of the sound, the EKG monitor that was still connected. A few seconds later, a second beep sounded as a ventricular spike appeared on the monitor screen, and then another, and then another. By the time the EKG rate reached 90 a minute, it seemed like an hour had passed, but it was in fact no more than 2-3 minutes. We rapidly reconnected the ventilator, reversed the dismantling process, and resumed the cardiopulmonary resuscitation.

I do not know what caused Lisa’s cardiac arrest and, much more significantly, do not know why her heartbeat returned after 62 minutes of unsuccessful resuscitation. This case does not argue for extending resuscitation out to an hour in most cases, or in any cases, for that matter, perhaps with a few rare exceptions. Well-established standards tell us when to stop.

To me, the value of this case is to serve as a reminder of the limitations of our knowledge, of our skills, and of our technologies, as sophisticated and powerful as they seem to be. It also reminds us of the marvelous resilience of the human body and spirit. As surgeons, we are attracted to the healing professions by the nurturing, supportive sides of our nature, the intellectual challenges of learning what is known and unknown, as well as the more practical benefits of the prestige, social status, and financial security that comes with being a physician. We are attracted to surgery in particular for several additional reasons. Its palpable, visible results are often dramatic and provide us with the early gratification of positive results. Its intellectual challenges abound — Dr. William Silen often quipped that a surgeon is an internist who has completed his education. Cardiothoracic surgery in particular is appealing because of the peaks and valleys of success and failure (the former substantially outweighing the latter), success bringing accolades of appreciation, failure challenging our ability to learn from our errors, to grieve, and, despite disappointments, to continue operating.
Although I am far from retired, I have not actively done surgery for several years, so have had the opportunity to reflect retrospectively upon the meaning of a career in cardiothoracic surgery. One result of this reflection is the realization that our rewards go beyond those that my discussion so far suggests. As cardiothoracic surgeons, we have access to the deepest, if often hidden, hopes and fears of those who entrust themselves to our care, as well as access to the core of their physical existences when they are under anesthesia, totally helpless and vulnerable. In retrospect, I have been able more fully to appreciate the depth of trust and the weight of the responsibility that trust places on us every time we step up to an operating table. Our position as cardiothoracic surgeons enables us to witness with almost unimaginable intimacy the complexity of the human organisms we help to repair, and rewards us with the possibility of making ourselves into physicians who are worthy of the immense trust that such intimacy necessitates. Yet, while we justifiably take great pride in what we do and what we know, we must at the same time acknowledge with an equal measure of humility the vastness of all we do not know and can only hope someday to understand.