Mimi Swartz: The Quest for the Artificial Heart

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Speaker: Mimi Swartz, Executive Editor of Texas Monthly

Mimi Swartz

00:00:00,000 This is a work in progress that I'm going to be talking about tonight. And I would encourage you to interrupt with questions, or I can talk for a while and then I can answer questions at the end. I thought I would talk a little bit—because I know not everyone is a historian. Some of you are spouses of medical historians or spouses of doctors. And so I tried to combine some history with some narrative from the book. But I thought I'd begin by asking a question of all of you. I'd like to see a show of hands if you were suffering from fatal heart disease, you knew you only had a short amount of time to live, and a doctor came to you and said, "Well, we've run out of options. Would you like to try this experimental procedure? This is this last thing we can do to keep you alive. It's an artificial heart." How many of you would go for it?

Okay, if it was your child, how many of you would let them implant it in your child? And if it was your eighty-eight-year-old father? Anyone? Boy, you in the back. You're—this is just my ongoing research project to see because I don't know. I was out with a friend the other night, and I said, "I think I'm having trouble writing this book because I don't know how I feel about this device. And she said—being a therapist as well as a friend—she said, "Well, that's your book." And I thought, "Oh my God. I should pay her $150,000 for that great insight." So that's probably the narrative of the book, at this point, is sort of going through the history of this device and also looking at my own thinking and feeling and how that changes over time.
I also was told that the last speaker spoke for two hours a year ago, so I don't think I'm going to do that. But if you all start to drift, let me know. I was going to talk first about how book ideas come about because I've written a book about Enron that came out in 2003. My friend Rebecca remembers that period. It was a dark one. And then I was looking for another book idea and I couldn't find anything that interested me. I think books are a little like having babies. You forget how difficult it is. And so you do it again.

And in this case, I had been looking for something to talk about. And I had another interview scheduled on a completely different story, and I almost didn't go to this lunch. I thought, "I've got enough. I can write this story. I don't need to talk to this guy." And the guy I met with was an artist named Dario Robleto. And we were talking about the Menil collection. And then I just asked him what he was doing. And he said, well, he'd just moved to Houston and he discovered that there was this really interesting doctor here named Bud Frazier. I don't know how many of you know him. And I sort of said, "Oh, I know Bud." And he said, "Well, he's just got this amazing project in trying to invent the artificial heart. He's been doing it all his life." And I thought, yeah, I know that. I thought about that for a book, but there just wasn't enough to sustain a complete book just on one person I thought.

And then he said, "Well yeah, you know, I didn't realize, but this had been going on for fifty years in Houston." And he started talking about Denton Cooley and Michael DeBakey. And I thought, oh for God's sake, this is the book. Here it is. I went to lunch and came away from lunch—I picked up the check—and I had a book. And sold it fairly quickly to a publisher, and I think that was about forty years ago. And since then, I've been working on the book. But, again, I don't know how many of you know too much about artificial hearts, but this story—the reason it was a book is because it spanned fifty years to me. And that's fifty years of American innovation plus fifty years of American medicine. And the changes in that time had been substantial. So it's not just the story of an artificial heart to me, but it's a story of how—we innovate now.

When Denton Cooley started out, he could do anything he wanted and did. There was no FDA standing over him telling him what he could and couldn't do. A lot of the early doctors here had much more freedom for good and for ill than someone like Bud Frazier has even now.

And I also thought I could talk about Houston, which is the only reason I did the Enron book because I could write a story about Houston as well because it's fascinating to me. And this story had fabulous
characters. It had not only people like Michael DeBakey and Denton Cooley, but it has Mattress Mack. And once I heard that he had become a founder of this project, I thought, "Oh my God. There is a God." Because there aren't too many sentences that have the name Michael DeBakey and Mattress Mack in the same sentence.

00:05:39,087 And I don't know how many of you know Billy Cohn? Do you know of Dr. Cohn? Dr. Cohn works with Dr. Frazier on this project, and in his spare time, he is a musician and a magician. So every time I go in to see Billy, he's like, "Hey, let me show you a card trick."

These are all—my favorite story about Billy is one of my early interviews took place before Halloween. And he lives in a very large house in Bel Air. He had invented this doll, which sort of looked like Chucky. And he would string the doll from the far end of his giant yard and then pull it in really fast and then send it out again to scare the children. And then they'd all come screaming into his house and watch the rest of the kids. And I thought, "Okay, this is a character that can support a part of a book."

So the book proposal didn't take very long. And I did have a warning from a friend who said, "I don't know how you'll ever get those doctors to sit still long enough to talk to you." And I thought, "Don't be ridiculous. Everyone wants to talk." Well, she was right. It's been like chasing—I feel like a CIA agent sometimes tracing these doctors around the world. But it's working out pretty well.

Again, I thought, "Well, I wrote about Enron. What can be more complicated than Andy Fastou's calculations?" And of course, it turned out to be the artificial heart, but Bud is also—I thought—Bud is the central character of this book because, I think, he has the biggest heart. And there's so much about him that I thought a reader could grab onto.

He is, in a lot of ways, an old-fashioned doctor who, despite all the obstacles put in front of doctors today, still puts his patients first. He essentially lives at the hospital still in a book-lined office with a broken sofa that he's been sleeping on for, I think, fifty years. But his life's dream has been to build the artificial heart.

And he has devoted virtually every waking moment to this. This story he told me, the inspiration was when he was a medical student with Dr. DeBakey, who many of you may know was not known for his kindness and generosity. Frazier was a med student, and watched Dr. DeBakey open the chest of a twenty-four-year-old man and put in a heart valve. And later that night, the man's heart stopped, and it was Bud Frazier's job to keep massaging the heart to keep the guy alive. And they were making eye
contact because the kid knew that this was what was keeping him alive was this man's enormous hand squeezing on his heart and making it work. And finally, DeBakey came in and said, "Stop it. You can't save him anymore."

00:08:53,969 So Bud, I think after DeBakey screamed at him the fifth time, finally stopped. But really from that moment on he thought there has to be a way to build a device that you can take off the shelf and put in someone's chest and make them whole again. And so that's really—that's how he spent most of his time since then besides being—I think he's done more transplants than any humans alive and has many, many patents and inventions. One of the things that struck me when I started this book was coming to understand how young heart surgery really is. I saw a film of DeBakey saying that for even most of his life until the 1950s there was very little you could offer people except go home and rest, which as we now know might not be the best thing for them. But no one knew smoking, diet, stress, no one had any idea that these things could affect your heart. And in the fifties and sixties, especially when doctors were posing in ads suggesting that people smoke their favorite brands of cigarettes, people were starting to drop like flies. It became an epidemic.

Today, as most of you know, heart disease remains the leading cause of death. It kills more people around the world than all cancers combined. In 2008, for instance, it caused one out of six deaths in the United States. Every year, nearly 800,000 people will have their first heart attack will close to half a million will have recurrent ones. The American Heart Association states that someone in the US will have a heart attack every twenty-five seconds, and every minute, someone will die of one. And I think, if you’re me, I thought, "Well, yeah, but there’s all this transplantation. Why do we need an artificial heart when we can just transplant?"

Well, thanks to better car safety there are not enough donors for things like transplants. So the need for an artificial device is still extensive. Again, it’s up to—there's a lot of questions about whether you want one, but the need is there. In the 1950s though, the heart was like Mars to most people. Open heart surgery had yet to be invented. There was no such thing as a heart-lung machine. One early heart surgeon connected mother and son together to keep the child's heart beating while they were trying to perform some kind of procedure. It was taboo even, early on, to touch the heart at all. And a lot of the early work resulted in a great many deaths and not much else.
I think Bud Frazier told me a story where he was working with Cooley, and six children in a row died in one day, one morning basically. And what Cooley told people on his staff is we’re going to get up tomorrow; we’re going to start again. And this how discoveries—unfortunately, that's the only way we could make them. So the other thing that I thought was fascinating about Cooley, and I don’t know how many of you know this, he is still believed to be one of the greatest surgeons of all time. And his gift was his speed. So he could get in there and operate so much faster than so many other doctors that the need for something like a heart-lung machine wasn't as crucial for him as it was for other doctors because he could perform these operations so quickly.

But no one else could ever to replicate what he was able to do. But the ignorance—what I also thought was fascinating during this time—was that this lack of knowledge about the heart made people a little bit idealistic about what could be done. Because they didn't know anything, they thought, well, of course you can build an artificial heart. It was a lot like the space program where, of course, we could go to the moon. And in fact, Charles Lindberg invented an early artificial heart and so did this is my favorite—Paul Winchell. Is anyone old enough to remember who—?

Paul Winchell was a famous ventriloquist who later, after inventing an artificial heart, went on to fame with his dummies Jerry Mahoney and Knucklehead Smiff. He also invented the disposable razor, retractable fountain pen, and something called the invisible garter belt. And these were all on par with his artificial heart. But the person that I think we all owe the most impetus for doing this to is Michael DeBakey. In September of 1962, John F. Kennedy came to the Rice Stadium that we would send— we would have a man on the moon in ten years. And about a month later, Michael DeBakey went before Congress and said that if Congress would only give him the money, he would have an artificial heart within ten years. And I think what's interesting to me is we got a man on the moon.

It turns out it's a lot harder to build an artificial heart than to send a rocket to the moon. And some of these reasons are biological. I hear over and over again, "Oh, the heart's just a pump." And that's true, but it beats seventy-two times a minute, 103,000 times a day, 2.8 million times in an average lifetime. It's dependable as the sunrise except when it isn't. And that's when things get pretty dicey. The idea—it also has its own electrical system—you have to worry about the blood and many of these things they tried to put in the heart would destroy the blood, so that didn't work, but the idea of creating, basically, an artificial heart has to almost become a perpetual motion machine. And that was one of the things that I think I was most drawn to was this idea of how did these people create this device that will replicate
nature for a normal life span. One of the things—I'm skipping around a little—DeBakey—oh, they had—what they had was a certain scientific optimism. What they didn't have was the knowledge. And they also didn't have things like—as I said before—the Food and Drug Administration which meant they could experiment fantastically.

There was one doctor, who I think I won't name, who was performing a heart surgery in the sixties, and he didn't have a donor heart. He didn't have an artificial heart. He turned to a nurse and said, "Bring me the sheep's heart." And they, in fact, put a sheep's heart in a man. And it didn't work, but that's the kind of thing that wouldn't really happen today. Especially in Houston there was this sense of you can do anything, and if it's going to save the patient, it will all be worth it. And then too, I think there was a problem with technology. Some of these ideas about how to make this heart work were brilliant ideas, but the technology wasn't available yet. It hadn't even been invented. DeBakey had a very eccentric guy in his lab who would fabricate these devices. Just sort of he'd tell them what to do and if there was a mistake, he'd have to go back and start over again. And it would be months before they would have another prototype.

Well, now they've got 3D printers, so if you mess up, you just go back and you've got another one in the morning. But I think the other thing that struck me most of all about this story are the personalities. I thought, and I think it's something for the ethicists in the audience to think about to, what kind of person has the confidence and the drive and the imagination and probably the relentlessness, I guess, to believe they can actually replicate a human heart? And how does that personality type shape that person's life and the lives of those around them? Bud Frazier has a sign by his door that says nobody but nobody gets in to see the wizard, which tells you some things. I don't think he put the sign up, but it does tell you a lot.

I know, of course, he doesn't really think of himself as the wizard. A lot of the time when the door's closed, he's listening to a Russian movie in Russian. But there is something about these powerful personality types that have driven this invention forward. And I think, again at the end, I'm going to talk, and ask you all, about well, was it worth it or not. But it's a little like—I don't know how many of you have read Tom Wolfe's *The Right Stuff*, but the kind of personality that went up into space is very similar to these surgeons on the forefront of heart—of coronary care, coronary surgery. I think Bud's greatest moment of inspiration was not when he was saving this young man, but actually, he came to realize over time that a pump wouldn't—a conventional pump, a conventional compressor, that imitated nature,
wouldn't work as an artificial heart. It was like flying when we never got in the air until people stopped thinking about flying like a bird.

00:19:25,632 And you had to come up with a very different kind of idea and a different kind of function to make this work. And what he envisioned—and please forgive me if I'm a little off if someone knows better—was something more like a turbine, something that flowed continuously. If you had a pump and something that compressed, it was going to break. It couldn't last as long. Your delicate, unhealthy patient would be back in surgery before he knew it. But if you have a turbine, if you had something that continuously pushed the blood through the body, that was something that could last indefinitely. And that's where his research took him.

There was—the first—I've noticed in my reading that the doctors who implanted a heart in Barney Clark in 1982, when I know all of us were five, are heralded now as the first implanters of the artificial heart, but in fact, Denton Cooley put one in 1969 in a man named Haskell Karp. And it was a compressor. It was a traditional device. And I'm not going to go into the details of how he came into that heart. Those of you who know, know. And those of you who don't will have to buy the book. But Karp lived for—he was a man in his forties. He's from Chicago, had been like a contractor, a blue-collar worker. He lived for 65 hours with that device. And then after him, the device, the compressor that helped Karp was enormous. He was basically locked in the ICU with this enormous device that helped to push the blood through his body, helped to make the heart work.

And then, it wasn't—nothing happened for about twenty years after that partly because there was one of the first liability lawsuits against Cooley after that happened, which he won by the way. But the next person to get an artificial heart was named Barney Clark who was a Utah dentist. And that happened in 1982. I don't know if you all remember Robert Jarvik, but he was almost as handsome as Denton Cooley and became a media star. This was sort of the era when hearts—there was nobody sexier or more handsome than a heart surgeon. And Jarvik actually even posed for magazine ads and a Hathaway shirt with an eyepatch over his eye. But Clark, it was the same kind of thing where Clark was basically locked in a room. He'd been extremely ill. He had volunteered to have this device put in not because he thought he was really going to live. He thought he could basically do something for mankind with the end of his life. And he lived for 112 days, but this heart device by Robert Jarvik was also very large, very uncomfortable. And again, the compressor and the electrical system were enormous. And the noise they made was constant. So he was always in a room with this hissing and booming until finally, he asked the
doctors to let him go. He got sicker and sicker, and he just—was in a near state of psychosis as a human experiment.

00:23:13,072 It was during this time that Bud Frazier went another way and began working on something called the LVAD, which is a left ventricular assist device, which is a much smaller item that helps the left side of the heart which does the heavy lifting work. And in the beginning, those were also sort of compressor like devices. But now, they're about this big and they spin. And his feeling was, at the time by say the nineties, that if you put two of these together, maybe that would work as an artificial heart because the LVADs after—I think he told me—the first thirty people died. And then the thirty-first lived. And then they were on their way. The LVADs turned to be a very successful operation even though a great many doctors wrote essays about how it would never work.

But in 2011, he and Dr. Billy Kohn finally had a patient and had a device that they thought would save someone. And it was basically two left ventricular assist devices just put together. And that was what they called an artificial heart. They thought this was it; they’d done it. There was publicity all over the place that they were ready. And I don't know—I'm trying to gauge your interest. I can now read to you from the first chapter about that operation or I can stop here and answer questions because I'm very worried about that two hour—this won't go that much longer, but it's up to you all.

**Male speaker**

We have time to read the chapter.

**Mimi Swartz**

You want to hear? Okay. This is written for a mass audience. I just want to say. So any mistakes, I hope to correct, but you can make a note and hand it to me later all of you doctors in the audience. This is the story. I've cut it down considerably, but this is the story of Craig Lewis who was that patient who got this artificial heart.

"The kids fell in love with him first. Craig Lewis lived three houses down, a tall solitary bean pole of a man with a copper-colored Golden Retriever named Shogun. He looked to be in his late thirties and Linda Sanders knew from neighborhood gossip that he had one marriage behind him just like she did. Just then, Shogun seemed to be his constant companion. Craig had taught that dog to just about anything. Of course he could sit, stay, fetch, and hunt, but he also knew how to play hide and seek with
even the canniest kid. That was one reason why as soon as Linda Sander's children heard Craig pull his pickup into his driveway in the early evenings, they were out the door. Leslie was eight and Eddie six, two towheads on the run, raising small clouds of dust as their feet slapped the parched summer grass."

00:26:16,488 "Don't wear your welcome,' Linda warned to the screen door they slammed behind them. It was always this way. The sky would turn dusky and the shadows grow long before she’d give up waiting for their return, wipe her hands on a dish towel, and head down after them. The last light of day was at her back heating her neck and shoulders as the hot, damp closeness of Houston summer took her in its seasonal embrace. There were people who swore it always cooled off at night here, but Linda knew better. She’d lived all her life in this tattered north Houston neighborhood and she knew what changed and what didn’t or couldn’t. Linda could see from the flattened grass that her kids had literally beat path to Craig's door. It never occurred to her that he was being anything but nice, nicer than he had to be to two kids looking for man who could replace the one who’d left them."

"He was handy, that was for sure. When Eddie dragged his broken bike to the door, he fixed the chain, cleaning it up with WD-40. He let Leslie draw in one of his old sketch books. If the kids were talking about the moon or stars, he would haul out his telescope and let them look through it at the night’s sky. Once, when Linda’s air conditioner went out, the worst thing that could happen in the middle of a Houston summer, Craig came over and fixed if for her, no charge."

"Linda was a slight woman of twenty-seven with a smile that was both knowing and tentative. Her thin brown hair fell lank below her shoulders, like this street, small frame houses guarded by rusting cyclone fences. She could have been pretty if she’d fixed herself up, but who had the money or the time. As of that year, 1990, she had been divorced for six years and was barely making ends meet at a clerk an auto-parts store. She lived with the kids in a tired, two-bedroom house she rented from her mom. It sunny, yellow hue fading to a peaked sunrise. Home improvements were out of the question. Leslie and Eddie were always needing new shoes, school clothes, tetanus shots, whatever. Every day seemed like the one before it. Get up. Get the kids out the door to school. Get them home. Do homework. Feed them dinner, then give them baths. Put them to bed. And then get up and do it all over again."

"She was in her late twenties going on forty-five. Maybe that’s why she found Craig's place such a comfort. Neat as a pin, inside and out, she thought, quite and orderly. Lewis was a project manager for the city. He had walked away from community college just shy of an engineering degree because he didn't see the point he had told her. The other engineers, the ones with the big degrees, started calling
him for advice after his first few months on the job anyway. He was teaching Leslie to fold clothes. He towered over her little girl as they did that funny, laundry waltz in the living room with the sheet getting smaller and smaller between them. Leslie was giggling, the corners of the bed sheet clutched between her stubby fingers. And Linda had an anxious moment wondering whether he'd have to wash that sheet all over again once they were gone. Then she looked along for Eddie, scanning the glossy, wooden floor, the sofa still peppy and full from disuse, the walls lined with bookcases filled with volumes on engineering and medicine and oil field equipment and just about anything else having to do with moving parts."

0:29:39.5 "No sign of her son though. She looked at Lewis quizzically, and he met her gaze and for just a moment, she caught a twinkle in his eye and the flicker of a grin at the corners of his mouth. Then he turned away. 'Shogun, find Mark,' he said to the dog who had been sitting attentive as if waiting for the command. In a flash, he dashed into the kitchen where he skidded to the front of a cabinet door. Then, with a sigh, he dropped himself to the ground beating his tail on the hard floor, moving his eyes from the handle to Craig and back again, waiting. Craig bent over to take the final fold of the sheet from Leslie, put a finger to his lips and then stepped toward the dog, flinging the cabinet doors open to reveal her son curled over like a beach ball trying not to laugh. 'I'll spoil your dog if you'll train my kids,' Linda told him. She shooed them toward the front door, patting them with her palm between their shoulder blades both to hurry them along and to claim them as hers."

"So eventually, Craig and Linda married, in 1993 when she was thirty and he was thirty-six. She was happy. He was happy. The kids grew up happy and strong and smarter, she knew, than they would have been if Craig hadn't come into their lives. She had been crazy in love when they had married, but sometimes it caught her by surprise how much her love for him had deepened over time. It was so easy and natural, the way she had always dreamed life should be but never was. She knew he felt the same way. He'd take her in his arms and they'd sleep safe and sound, two people without a care in the world."

"That was how it was for seventeen years until the morning Craig said, 'I think there might be something wrong with my heart.' He said it the way he said everything, calmly, quietly, like she shouldn't worry. It was September 2010. Craig was fifty-three and had never had a sick day in his life. He hadn't been able to sleep he was waking up nights to the pounding of his heart like it was going to leap out of his chest. Craig made an appointment with the cardiologist who didn't find a thing, no reason to worry."
"So Craig went back to doing what he'd always done, which at that time meant, but he kept himself busy on weekends, installing hardwood floors in their living room, but instead of staying up reading late into the night, he'd fall into bed early, exhausted. 'I'm tired,' he told her. 'Well,' she said, 'you should be tired. I'm forty-seven and I'm tired.' But really, she wasn't tired, and she didn't think he should be either."

00:32:16,685 And this is a section that introduces Bud, more or less.

"As famous as Dr. O.H. "Bud" Frazier was in cardiac circles and as a heart surgeon, he was world famous with a curriculum vitae that spanned a hundred and seventy pages of publications and honors. He also knew that many people thought he might be nuts. It wouldn't occur to Frazier to waste his time disabusing anyone of that notion. He was seventy after all and still had much to do. He was a tall, broad, vigorous man with a patrician nose, piercing eyes he hid behind the glare of his wire-rim glasses and a leonine mane of shimmering silver hair. Frazier's body, despite being routinely punished and neglected over decades of sixteen hour work days, continued to show the kind of relentless robustness that had inspired UT football coach, Darrell Royal, to offer him a place in the team in the early sixties and later suggested to his military superiors that he would do well as a helicopter medic in Vietnam. In between, Frazier distinguished himself at Baylor College of Medicine where he was a protégé of both Michael DeBakey and Denton Cooley, men who, with possible exception of Dr. Christiaan Barnard who was a famous—he made the first heart transplant—were then the most famous heart surgeons in the world."

"When Frazier's tour of Southeast Asia ended, he headed back to Houston and never left. In the process, Frazier racked up any number of firsts. He had performed more than 1,000 heart transplants in his illustrious career, more than any other surgeon on the planet. He was the first surgeon to perform a heart transplant on an infant. He pioneered the creation of the first widely used heart assist device called the HeartMate and had been the first to implant it and so on. Frazier could also find his way from his parking space to his windowless, book-filled office, over the sky bridge and through a maze of hospital corridors that still stumped the occasional intern without once looking up from whatever reading material he stowed in the sagging left pocket of his lab coat for just that kind of downtime. Chekhov, Plutarch, Faulkner, and all the great plays all did time there. Frazier had read Hamlet so often that he could recite the entire play by heart. He was present when he needed to be. The majority of his patients and awakened more than once in the dead of night to find him at their bedside, his fingers resting lightly on their pulse. But other times, he seemed to be somewhere else entirely, shuffling down a hospital corridor, his eyes fixed on the tattered paperback book in his hands. Walking past his dark cave of an office, nurses and secretaries accustomed themselves to the sounds of Russian emanating
from behind his door. Frazier had inserted another subtitled video of a Surrealists Soviet Film and then
forgotten about it."

0:35:11.8 "By the fall of 2010, Frazier was more than mildly distracted by something far more pressing, the notion that his life might end before he could accomplish the goal had pursued with singular
dedication for virtually his entire medical career. Not coincidentally, this was the same goal that had
made him, for decades, the butt of good hearted, but nevertheless, painful jokes among his colleagues.
Still, he was the driving force behind the development and popularity of what had come to be known as
Left Ventricular Assist devices, which did half the hearts work, pumping blood from the left side of the
heart into the other chambers and out again."

"He liked to say that he had put in the first twenty-five LVADs and all the patients died, but then the next
person lived. He never stopped looking for a way to replace the heart entirely. He also knew there were
other surgeons in the US and around the world working on the same thing. Some of them did not have
to contend with trial lawyers, insurance companies, and a foot-dragging FDA. Still, Frazier believed he
had an advantage. Most of these contemporary inventors, like they're predecessors, were still wedded
to the idea that any artificial heart had to act as a pump like a real heart. This meant, among other
things, that a patient had to be hooked up to a compressor of some sort to stay alive. In the case of
Barney Clark, the recipient of an artificial heart by Robert Jarvik back in the eighties, the compressor had
been room sized, booming and hissing with each beat. The constant noise and the prison like conditions
had nearly driven Clark mad. He begged his doctors to take him off the machine and let him die, which
eventually they did."

"Frazier knew he was right about his design. In the late 1990s, he had put an LVAD in a young
Salvadorian immigrant, an auto mechanic. There had been a language barrier, so the patient hadn't
understood that he was supposed to come back in a few weeks for routine monitoring. He didn't show
up again until 2003. Frazier listened to his chest, then, and heard nothing but a whir. There was no heart
beat at all. It didn’t take him long to realize that the patient's real heart had stopped functioning
entirely. It was the LVAD, designed to do just half the work that had taken over and was keeping the
young man alive."

"¿Cómo estás? 'Frazier asked him, dumbfounded. 'Muy bien,' he answered. 'Why didn't you come back
before now,' Frazier asked. 'Estoy bien,' he told him, shrugging. 'I feel fine.' But despite Frazier's
international reputation in cardiac research and his invention of at least half a dozen life changing cardiac devices, he couldn’t sell his colleagues on the idea of a beatless heart."

I think I forgot to say, this device that Bud has worked on, you had no pulse because it’s spinning instead of pumping or beating.

"He wrote paper after paper for journal after journal only to see his research rejected time and again. Even Billy Cohn, a Houston-born, Harvard-trained surgeon who had recently joined Frazier at the Texas Heart Institute, liked to razz him. "I was like Robinson Crusoe doing magic tricks for the goats,' Frazier liked to say."

0:38:32.9 "On Thanksgiving day, 2010, Linda got up before dawn to put in the turkey and heard Craig wheezing in bed. He had a mysterious rash snaking up his leg and now he had caught the cold Leslie had brought home from school and hadn't been able to sleep at all. Linda walked into their bedroom, took one look at her husband's ashen face, and stripped off her nightgown and threw on a t-shirt and jeans. 'We're going to the emergency room,' she said."

"At St. Luke's, the doctor put the stethoscope to Craig's chest and didn't seem too worried. Probably bronchitis. They should see a pulmonologist just to rule out the beginnings of asbestosis or emphysema. Craig and Linda left with a referral and a round of antibiotics. Craig ate his turkey late that night in bed. For the next few days, he rallied. The color came back into his cheeks, and he got out of bed to attend to some of his projects. But then the antibiotics stopped working and the symptoms came roaring back. Linda called the doctor at St. Luke's again, but this time, he wasn't quite as reassuring. 'Maybe the old infection had jumped from one lung to the other. I think something more is going on,' he said carefully. He prescribed another round of antibiotics, stronger ones, and urged Linda to get Craig to a pulmonologist as soon as possible."

"Then, just after Christmas, Craig asked her to take a look at his ankles. Looking down at his swollen flesh, Linda was reminded of the book of Job she’d studied in Sunday school. Now, along with the rash, the swelling started getting worse every day so that Craig couldn't walk by New Years. This time, he went to St. Luke's by ambulance and late that night, he went into respiratory failure. St. Luke's was a private hospital. Craig had good insurance through his job with the city, so the waiting room in the ER was almost empty when another doctor burst in. He was wearing scrubs and Linda could tell by the stony look on his face and the speed of his stride that he was angry."
"He was still six feet or so away when he started screaming at her. 'How can you say your husband doesn't have heart problems,' he demanded. Linda shook her head. He moved in so close that he was standing over her, one big angry shadow. 'He doesn't,' she said. Her voice wasn't as firm as she would have liked it to be, but she was confused. The doctor whirled his body into the seat beside her and leaned in so that she could smell his stale breath. She tried to follow what he was saying, but couldn't focus. Craig had septic shock and double pneumonia, and worse, his heart was barely beating. How could she not have known? Why had she waited so long to get him to the hospital? 'But he never mentioned a thing,' she blurted. How was this possible? They didn't keep secrets from each other.

0:41:24.3 "The doctor studied her face. 'Maybe he didn't tell you?' he asked. He backtracked. Craig was very, very, very sick, he began. He had only a fifty-fifty chance of making it through the night. The nurses let her into the cardiac ICU for just a few minutes, long enough for her to put a hand on Craig's forehead and push some strands of hair away. Then Linda bent toward him and whispered in her husband's ear, 'You'd better wake up and tell me what I need to know.'"

"Lewis's first hospital visit had lasted twenty-one days. His doctors sent him home and then he was back for eighteen with multiple organ failure. One of Frazier's colleagues put a balloon pump in his heart. The kidney specialist put him on dialysis. The following Friday, he coded, med speak for almost died. Lewis looked like someone just released from a concentration camp. The results of a biopsy of his heart tissue finally solved the mystery. He had amyloidosis, a disease in which proteins formed toxic sheets in the organs of the body, eventually destroying them from within. It was extremely rare. The last case any doctor in Houston had seen was five years ago, and it moved through the body with lethal speed. The presence of amyloidosis ended any possibility of a transplant. Even if Lewis had been strong enough for the surgery, the disease would immediately attack the new heart."

"Frazier was called in in March when another surgeon, who had heard of his work, wondered whether an LVAD might help. It wouldn't, Frazier told them, because Lewis's heart was already too damaged. He had only one idea that might give Lewis a little more time. Late one night, he put in a call to Linda. 'If we could just get in front of the amyloidosis,' he told her, 'maybe we could buy you some more time.' A few days, weeks, he just didn't know. Then he began explaining to her as best he could the intricacies of a device he and Cohn had been working on."

"Linda listened quietly without interruption and became hopeful enough to make a joke. 'Craig's going to want see a manual,' she said. Her husband never did anything without reading the instructions first."
DeBakey had once told Frazier, "You can operate on really sick people, but everything has to go right.' The FDA had recently approved a new continuous flow heart-assist device developed by Frazier and Cohn. It was called the HeartMate II and essentially it was two LVADs put together, working as one. Frazier knew it could replace a human heart entirely because he had implanted it in enough cows to start his own dairy, more than thirty of them. Frazier also had the legal issues covered. Any FDA approved can be used a doctor's discretion in a life-threatening emergency. There was a procedure they had to follow, of course. In about forty-eight hours, Frazier and Cohn's team had to fill out a lengthy permission form from the FDA."

"Finally, on March 10th, he walked into the Texas Heart Institute largest operating room wearing his orange University of Texas t-shirt under his scrubs. An associate had opened Lewis's chest, and now his diseased heart sat exposed, barely beating, the color of rotting meat. Tubes and wires snaked in and out of his body, but Cohn and Frazier moved around him effortlessly, never quite standing up to their full height as they worked. Frazier began by unceremoniously cutting out virtually all of Lewis's heart. With his enormous hands covered with yellow gloves, Frazier made several incisions, and lifted the organ out of Lewis's chest, handing it to a nurse who matter-of-factly put it in a cooler for pathology. And then, for the next nine or so hours, Frazier and Cohn began stitching the machine to Lewis's body. Frazier could feel the crowd of doctors and nurses leaning into the skylight in the viewing area above him, but he never looked up, not once."

"Patient's families were never allowed to watch operations, so the first glimpse Linda Lewis got of her husband was the next morning when she entered his hospital room. He was sitting up in bed, surrounded by wires and tubes, tapping away on his computer. It was the first time in months Linda had seen him breathing on his own. One of the doctors saw her and beckoned her closer. 'Want to hear it?' he asked, guiding her toward the bed. She leaned in and put her ear to Craig's chest and waited. Then she shifted her body so that she could press just a little harder. There was almost nothing there. No thump-thump she said later, just a faint whirring somewhere deep inside. No heartbeat, no pulse. By any traditional measure, he Craig Lewis was a dead man, except that he was alive."

That's it. And so I'll discuss any mistakes in the back of the room later. Okay, so who would get one now? Did I change any minds? Did anyone—now no one wants one? Well, you may be called upon to volunteer.