

## The Texas Heart Institute Part 1—An Historical Perspective

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### In Honor of Dr Denton A. Cooley

In 1962, Dr Denton A. Cooley founded the Texas Heart Institute (THI), which he considered to be his greatest achievement. At the time, he was practicing at both St. Luke's Episcopal Hospital (SLEH) and Texas Children's Hospital (TCH) in the Texas Medical Center in Houston, Texas, and was already considered one of the most renowned cardiovascular surgeons in the world. In 1956, he and his team had performed the first open-heart operations in Houston, and by 1962, SLEH and TCH had the most active open-heart surgical program in the world. Nevertheless, they were still regarded as general hospitals. To establish these hospitals as premier sites for cardiovascular medicine, Dr Cooley wanted to create an affiliated institute focused on cardiovascular medicine research and education. It would have no patients of its own, but it would draw patients from around the world to SLEH/TCH for treatment. The idea of affiliating a specialty institute with 1 or more pre-existing hospitals had a strong precedent at Dr Cooley's alma mater, Johns Hopkins Hospital, in Baltimore. From the beginning, the Institute's mission has been to reduce the devastating toll of cardiovascular disease through innovative programs in treatment, education, and research.

On July 13, 1962, at a joint meeting of the 2 hospital boards, Dr Cooley presented his proposal for the project, and the joint boards tentatively approved his plans. On August 3, 1962, the THI charter was officially registered in Austin, the state capital. Dr Cooley immediately began raising funds to build the Institute and finally reached his goal in 1966, after he learned that the Ray C. Fish Foundation, a relatively new charitable group, was seeking a worthy project. The foundation had been established on behalf of a man who had died of heart disease. Its director, Robert R. Herring, agreed to donate \$5 million to THI. On hearing of that gift, various other philanthropic groups and former patients chipped in, providing the full amount that was needed. These donors included Gus Wortham, Houston Endowment, Inc, and the Clayton, Brown, and Abercrombie Foundations.

For Dr Cooley, one of the most memorable personal contributions was that from Harry S. Blum, chairman of the Jim Beam Distillery. Mr Blum had come to Houston from Chicago to have Dr Cooley repair a ruptured abdominal aneurysm. Ten days later, Mr Blum invited Dr Cooley to stop by his suite

at the Shamrock Hilton. After Dr Cooley examined him and confirmed his complete recovery, Mr Blum asked what the fee was. Dr Cooley replied that there was no fee—he could not put a price on his life. Remarking that he had seen the model in the lobby for the new hospital expansion, Mr Blum asked, “How much would it cost to endow the whole thing?” Dr Cooley asked for a contribution of a million dollars. Mr Blum agreed, and they drew up a simple contract on the spot. With that paper in hand, Dr Cooley went straight to the TCH auditorium, where a fund-raising meeting was in progress. Waving the contract, he told the leader, “I do not know how much you will raise today, but I just raised a million dollars from a single individual.”

When SLEH and TCH developed plans to expand their facilities, they agreed to incorporate THI within their expansion programs. The Institute's official name was to be the THI of St. Luke's Episcopal and TCHs. (Later, TCH developed its own administration and built its own new hospital, separate from SLEH and THI.) The groundbreaking ceremony for the new building occurred on June 26, 1967, and the new operating suites were opened for surgery in January 1972. As further sections of the tower were completed, the THI team moved into them.

Soon after its founding, THI became the most prolific heart surgery center in the United States and possibly the world. Coronary artery bypass grafting had recently been introduced for treating atherosclerotic disease, and THI was deluged with patients who needed the procedure. The nearby Shamrock Hilton Hotel, where many of them stayed, became known as the Cooley Hilton.

Early on, formal divisions were organized, and chiefs of service were appointed: Drs Edward B. Singleton, Radiology; Arthur S. Keats, Cardiovascular Anesthesiology; Dan G. McNamara, Pediatric Cardiology; and Robert D. Leachman, Adult Cardiology. Dr Robert J. Hall was appointed medical director, and Dr Cooley was president and surgeon-in-chief.

During its brief history, THI has substantially advanced the diagnosis, treatment, and prevention of cardiovascular disease. The Table lists some of the early milestones of THI. Perhaps, the breakthroughs that most galvanized public attention in the beginning were the first successful cardiac transplantation in the United States (1968) and the first clinical implantation of a total artificial heart (1969).

The opinions expressed in this article are not necessarily those of the editors or of the American Heart Association.

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**Table. Historical Milestones of the Texas Heart Institute (1962–1999)**

1962	• Texas Heart Institute founded by Denton A. Cooley, MD
1968	• First successful heart transplantation in the United States
1969	• First implantation of a total artificial heart in a human
1974	• First issue of the <i>Texas Heart Institute Journal</i> is published, under the name <i>Cardiovascular Diseases: Bulletin of the Texas Heart Institute</i>
1975	• First study funded by the National Heart, Lung, and Blood Institute of an implantable LVAD for postcardiotomy support
1976	• First accredited School of Perfusion Technology in the United States
1978	• First use of an LVAD as a bridge to transplantation
1981	• Second implantation of a total artificial heart in a human
1985	• First laser angioplasty procedure in the United States • First laser coronary endarterectomy procedure in the United States
1986	• First peripheral laser procedure in Texas (one of the first such procedures in the United States) • First implantation of the HeartMate pneumatically powered LVAD as a bridge to transplantation
1990	• First cases of Maze surgery performed at SLEH for atrial fibrillation
1991	• First patient ever to leave the hospital with an electric, portable, battery-powered LVAD
1993	• THI selected as one of 7 centers in the United States to participate in the federal government's Heart Demonstration Project for Medicare patients • American Heart Association journal <i>Circulation</i> placed at THI/SLEH for an 11-y period, the second longest tenure of placement in the journal's history, with Dr James Willerson as Editor-in-Chief
1994	• FDA approval to use the HeartMate pneumatic LVAD as a bridge to transplantation
1996	• FDA approval to use the electric HeartMate as a bridge to transplantation
1998	• One of 6 centers chosen for cardiac magnetic resonance imaging trials

(Continued)

**Table. Continued**

• Groundbreaking for the new THI/SLEH—The Denton A. Cooley Building
1999
• FDA approval of a stent graft tested exclusively at THI/SLEH for repair of abdominal aortic aneurysm

FDA indicates Food and Drug Administration; LVAD, left ventricular assist device; SLEH, St. Luke's Episcopal Hospital; and THI, Texas Heart Institute.

THI staff members have promoted the Institute by publishing papers and speaking at meetings all over the world. In addition, THI began to hold its own educational symposiums. In 1971, the Institute established a school of perfusion technology to train perfusionists in the use of the heart–lung machine. At the same time, THI started a separate, accredited residency program in cardiothoracic surgery. After the arrival on staff of Dr Hall, a similar residency program in cardiology was established. Training programs in anesthesia, under Dr Arthur Keats, and in pathology, under Dr Carl Lind, soon followed. Academic programs such as these have been one of THI's chief successes. The Institute has also sought to further educate practicing physicians through the publication of the *Texas Heart Institute Journal*, the first issue of which was published in 1974.

To symbolize the Institute's past accomplishments and future goals, a 7-foot-tall, red granite, abstract heart was erected in front of THI in 1977. This statue, entitled *A Symbol of Excellence*, was created by Theodore H. McKinney, a grateful patient. Not only had Dr Cooley performed coronary artery bypass surgery on him in 1972, but he had also operated on his young daughter in 1954.

In December 1982, a \$33 million campaign was begun to add the final 4 stories to THI. The new space allowed for the addition of ≈60 intensive-care beds and space for the departments of cardiology, neurophysiology, respiratory therapy, biomedical instrumentation, and other ancillary activities and services. The plan included additional room for the School of Perfusion Technology; for medical students, residents, and fellows; and for research and treatment facilities.

By 1983, THI surgeons had performed 50 000 open-heart procedures, about half of which were coronary artery bypass operations. When surgical activity was at its peak, Dr Cooley oversaw as many as 30 operations a day and did up to 10 of the most difficult ones himself (Figure). As a result, he worked for up to 15 hours a day, every day. He was able to maintain a high volume of cases by letting other surgeons do the routine parts of the operation—opening the patient's chest, retracting the ribs, establishing the connections to the heart–lung machine, and later closing the chest postoperatively—while he performed only the repair itself. Although this approach reminded some observers of an assembly line, it allowed Dr Cooley to benefit the most patients within the time available.

During its early years, THI had an active foreign practice, as well as a domestic one. Dr Cooley received poignant letters from people in India, the Philippines, and other countries who needed heart surgery but could not afford it. In every case, he told them that they would not have to pay a surgical fee; if they could just pay half of the hospital bill,



**Figure.** Open-heart era, 1962, oil painting by Mary Cooley Craddock, commissioned by Denton A. Cooley, MD, for the Fifth Floor Lobby of the Texas Heart Institute at St. Luke's Episcopal Hospital—Denton A. Cooley Building.

he would find a donor to take care of the rest. In 1976, at the suggestion of Dr Peter J. van der Schaar, a Dutch cardiac surgeon who periodically worked with Dr Cooley's team, THI initiated a twice-monthly airlift of 8 to 10 patients from The Netherlands, who were flown to Houston for heart surgery. Most of these patients were men, 45 to 60 years old. Within the next 5 years, 1500 Dutch patients would be involved in the airlift. The arrangement was also extended to other countries.

In 1984, Dr Cooley conceived of a packaged plan called Cardiovascular Care Providers, which THI worked out with SLEH. It was the first-ever packaged-pricing plan for cardiovascular surgery. Under this plan, a global payment package (bundled service) covered all services, including physician and hospital charges. The resulting flat fee was lower than the sum of the individual charges. It not only reduced costs while maintaining a high quality of care, but also increased patient access, allowed payers to predict their expenses, and streamlined the billing process. Furthermore, patients were able to choose their own providers. Since 1984, the plan has been offered to the non-Medicare population through contracts with self-insured corporations, prepaid health plans, union trusts, and foreign governments. Beginning in 1993, it was extended to eligible Medicare patients. Several other cardiovascular centers have adopted similar packaged-pricing plans.

Among Dr Cooley's developmental programs, this packaged-pricing plan may have had the greatest overall impact on healthcare. It was successful because it was simple, physician-directed, and organ-specific, involving many related specialties; moreover, it benefited from the hospital's large patient population and extensive database. Indeed, much of THI's reputation was based on the volume of patients it cared for. As an admirer of Sam Walton, the founder of Wal-Mart, Dr Cooley was happy to be dubbed the Sam Walton of heart surgery.

Over time, the competition for heart patients has greatly increased. In the early days of cardiac surgery, surgeons had no competition. With the clinical introduction of balloon coronary angioplasty in 1978, however, cardiologists began to

revascularize the myocardium in the catheterization laboratory. As a result, surgeons had to compete with cardiologists and, therefore, began to lose coronary bypass patients. In THI's early days, only 2 or 3 other institutions in the southern United States specialized in cardiac surgery. Today, in Houston alone, 7 or 8 open-heart programs are available. Also, instead of sending patients to the United States for heart surgery, as was done in the past, most other countries now have their own cardiac programs, some of which are headed by former THI trainees. For economic reasons, Americans sometimes even go abroad for cardiovascular surgery. Because of these factors, THI's volume of open-heart operations has steadily diminished since the 1980s, when its surgeons were doing 5000 such operations per year. Nevertheless, THI surgeons are still very active; the number of procedures performed at THI still equals that performed at any other major institution in this part of the world. For 24 consecutive years, THI ranked among the top 10 heart centers in the United States by *US News & World Report's* annual guide to America's Best Hospitals. As of the end of 2016, THI's 201-member professional staff had performed >124,000 open-heart operations, 284,000 cardiac catheterizations, and 1,400 heart transplantations. These numbers were achieved through the efforts of 10 staff surgeons, 100 surgical residents, and several hundred cardiologists, radiologists, fellows in training, nurses, and devoted personnel.

On August 22, 2007, Dr Cooley's 87th birthday, he performed his last surgical operation. At first, he missed the operating room greatly, but, as an octogenarian, he believed that it was time to step aside. On August 1, 2008, Dr Cooley became president emeritus of THI, and Dr James T. Willerson became president. The fact that Dr Willerson was a cardiologist, not a surgeon, reflected a new emphasis on interventional rather than surgical treatment of cardiovascular disease and the growing belief that basic-science breakthroughs, such as regenerative medicine and genetic therapies, offer the best hope for preventing and treating such disease in the future.

## Disclosures

None.

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