Evolution of the Pediatric and Congenital Heart Surgery Service at Texas Children's Hospital: 1954-2015

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Heart surgery at Texas Children's Hospital can trace its origins to the beginning of pediatric and congenital heart surgery. Pioneers in the field – Dr. Denton Cooley and Dr. Dan McNamara – started the program in1954 at a new pediatric hospital in Houston. Over the past 60 years, what is now Texas Children's Heart Center has grown become one of the leading pediatric heart institutions.

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The West Tower and Clinical Care Center buildings at Texas Children's Hospital

Central Message

Heart surgery at Texas Children's Hospital can trace its origins to the beginning of pediatric and congenital heart surgery. Pioneers in the field—Drs Denton Cooley and Dan McNamara—started the program in 1954 at a new pediatric hospital in Houston. Over the past 60 years, what is now Texas Children's Heart Center has grown, become one of the leading pediatric heart institutions.

The heart surgery service at Texas Children's Hospital (TCH) can trace its origins to the very beginning of the specialty we now know as pediatric and congenital heart surgery. In 1951, just a few years before the hospital opened in 1954 (Fig. 1), Dr Denton A. Cooley returned to his native Houston to join the faculty of Baylor College of Medicine (BCM), and the surgery team led by Dr Michael E. DeBakey (Fig. 2). Dr Cooley's name would soon become synonymous with the pioneering explosion of the development of cardiovascular surgery, yet, it was the field of congenital heart surgery that had first fueled his interest in heart surgery. Dr Cooley completed medical school and residency at the Johns Hopkins Hospital, where he had participated in the dawn of palliative surgery for cyanotic congenital heart disease. As a young intern, he took part in the first successful surgical operation to create a systemic-to-pulmonary artery shunt, performed by Dr Alfred Blalock in November 1944. Emboldened by that experience, Dr Cooley subsequently spent a year as surgical registrar at the Royal Brompton Hospital in London. His experiences there, further exposed him to early congenital heart operations being performed by Lord Russell Brock who was performing beating heart pulmonary valvotomies also known as the Brock procedure. Despite an offer from Dr Blalock to join as fulltime faculty at Johns Hopkins, Dr Cooley chose to return to Houston to work with Dr DeBakey who was rapidly becoming known for his innovative surgical efforts in the treatment of cardiovascular disease.

Simultaneous with Dr Cooley's Hopkins education, Dr Dan G. McNamara was being educated under the direction of Dr Helen B. Taussig at the Harriet Lane Home for Children (Fig. 3). The storied relationship between Drs Taussig and Blalock is well summarized in a variety of historical documents and the eponym for their combined efforts in palliating congenital heart disease persists to this day as the Blalock-Taussig or BT shunt. Dr McNamara, also a native Texan, was one of Dr Taussig's star pupils. In fact, it was Dr McNamara who later played a leading role in the development of the subspecialty we now know as Pediatric Cardiology (Fig. 4). In 1954, when TCH opened, Dr McNamara became the first Chief of Pediatric Cardiology. He teamed with Dr Edward B. Singleton—the first chief of radiology at TCH—to develop a dynamic diagnostic and therapeutic team. With the appropriate surgical support in place, Dr Cooley performed the first closed heart operations at TCH in 1954. The team very quickly developed an interest in pushing the field of congenital heart surgery forward.

As TCH was opening its doors in 1954, Dr C. Walton Lillehei and colleagues began performing open intracardiac correction for congenital heart disease using a parent as a biological pump oxygenator (controlled cross circulation). Soon thereafter, his contemporary and competitor, Dr John Kirklin completed a series of successful corrections using a mechanical pump oxygenator system. These early achievements captured the attention of the TCH team and in 1955, Drs Cooley and McNamara traveled to Minnesota to spend several days observing first Dr Lillehei, and then Dr Kirklin. Dr Cooley's accounts of that memorable trip are remarkable, particularly noting the striking personality differences of Drs Kirklin and Lillehei. Drs Cooley and McNamara returned to TCH where Dr Cooley and colleagues were able to assemble a "home-grown"

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Figure 1. Texas Children's Hospital opened in 1954. Printed with permission from Texas Children's Hospital.

pump oxygenator system, literally scavenging parts from a restaurant supply store (Fig. 5). With this system, the era of open-heart surgery at TCH began. Teaming with pioneering anesthesiologist Dr Arthur Keats, who was enormously innovative in developing pediatric mechanical ventilation and endotracheal tubes among other important contributions, the TCH team rapidly amassed a large series of successful palliations and corrections in small children[1] (Fig. 6). Dr McNamara was the first to associate symptomatic congenital heart disease in babies as a cause of very high mortality, challenging the prevailing thought of the time that surgical treatment of small babies should be deferred until they were older and theoretically more resilient to surgery. It was Dr McNamara who strongly encouraged Dr Cooley to operate on smaller and smaller

Figure 2. Baylor College of Medicine house and medical staff outside Jefferson Davis Hospital in Houston. c1952. Stanley Crawford seated 2nd from left; Dr Denton Cooley far right standing next to Dr Michael DeBakey. Photo courtesy of Texas Heart Institute.

Figure 3. Dr Dan McNamara with his mentor Dr Helen Taussig. Printed with permission from Texas Children's Hospital.

children. Dr Cooley's technical brilliance and speed made the open corrections reproducible and relatively safe, even in the setting of the notoriously dangerous pump oxygenator systems of the time. In the era from the late 1950s-1960s, the TCH program developed the largest and most innovative series of newborn and infant operations for congenital heart disease including successful corrections of total anomalous pulmonary venous return, anomalous left coronary artery from the pulmonary artery, and tetralogy of Fallot.[2-4] These

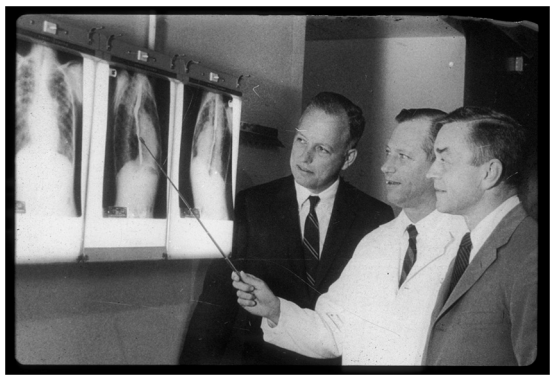

Figure 4. Drs Denton Cooley, Edward Singleton and Dan McNamara at Texas Children's Hospital in 1954. Printed with permission from Texas Children's Hospital.