As one of the largest pediatric health systems in the nation, Nemours has made a promise to do whatever it takes to prevent and treat childhood illnesses and injury, from the most common to the most complex. Every day at Nemours, some of the country’s top pediatric specialists, researchers and educators work together with our patients, their families, our physician partners, schools and communities to fulfill that promise.

Established in 1936 as a legacy of American industrialist and philanthropist Alfred I. duPont, Nemours cares for more than a quarter of a million children annually at its operations in Delaware, Pennsylvania, New Jersey, Maryland and Florida, treating children from across the nation and around the world. At Nemours, we are dedicated to achieving the highest standards and best outcomes for the children we serve. We begin by caring for children as if they were our own. For more than 70 years, this has been the Nemours Way.
# Table of Contents

**About Nemours Cardiac Center**  
2

The Cardiac Center Team  
3

Outcomes/Quality Measures  
3

Scholarship and Research  
4

Regional Services  
4

**Lucy’s Story**  
5

**Consultation and Treatment Services**  
6

Services Provided  
7

Prenatal Diagnosis and Care Coordination  
7

Noninvasive Cardiac Imaging  
7

Cardiac Catheterization  
8

Comprehensive Electrophysiology Care  
8

Cardiothoracic Surgery and Anesthesiology  
8

**Dalton’s Story**  
9

Cardiac Transplantation/Mechanical Circulatory Support  
10

Psychological and Neurodevelopmental Assessment  
10

Expert Preventive Cardiology  
10

**Ahsya’s Story**  
11

**Family Support**  
12

Genetic Counseling  
13

Inpatient Units  
13

Services and Accommodations for Patients and Families  
13

Electronic Health Records  
14

Nemours Kids Transport  
14

Community Hospital and Health System Collaboration  
14

Referring a Patient  
14

**Dylan and Brendan’s Story**  
15

About Nemours/Alfred I. duPont Hospital for Children  
16

Building a Healthier Future for Children  
16
Nemours Cardiac Center

At Nemours Cardiac Center, our team provides comprehensive pediatric cardiovascular care for children with the simplest to the most complex conditions, with a family-centered approach. Our outcomes and quality measures are among the best in the nation, giving our patients with congenital and acquired heart conditions the best chance for a long and fulfilling life.

What truly sets us apart is our personal approach to care. Organized as an exclusive center for cardiac care, we develop strong bonds with our patients and families as we help them navigate their unexpected journey. We provide advanced diagnostic and treatment capabilities in a manner that inspires trust, comfort and confidence.
The Cardiac Center Team

- Board-certified pediatric cardiologists, cardiothoracic surgeons, anesthesiologists and critical care physicians along with physician assistants and advanced practice nurses comprise the center’s unified medical team.
- Experienced Cardiac Center nurses, technicians, nutritionists, therapists, social workers, clinical psychologist, genetic counselor, child life specialists, educators and researchers are dedicated to the care of children in our Cardiac Center inpatient and outpatient units, and use their skills to involve and assist parents in supporting their child.
- Our team works solely in Nemours Cardiac Center; many have been members since the Center opened in 1998.
- We have access to more than 30 other pediatric medical and surgical specialties within Nemours to ensure comprehensive care for children with complex conditions; these include genetics, gastroenterology, pulmonology, neonatology and neurology.
- As members of the faculty at Thomas Jefferson University, our physicians take part in educational and other scholarly activities including publications and invited participation in national and international forums.

Outcomes/Quality Measures

- Nemours Cardiac Center has been an active participant in the Society of Thoracic Surgeons Congenital Heart Surgery Database since 2005 and ranks among the best institutions for risk-adjusted outcomes.
- Nemours Cardiac Center cardiologists have reduced the X-ray time of electrophysiology procedures to less than five minutes in most cases, significantly below the national average.
- Cardiology and cardiac surgery at duPont Hospital for Children were ranked among the nation’s best by U.S. News & World Report for 2012-2013.
- The Leapfrog Group has named duPont Hospital for Children one of 12 Leapfrog Top Children’s Hospitals in the country for patient safety and quality for 2012. The hospital was selected as a Top Hospital out of nearly 1,200 hospitals participating in The Leapfrog Group’s annual survey.
- Nemours patient families consistently say they would recommend inpatient and outpatient care at Nemours Cardiac Center; 85 to 90 percent rank us in the highest category in Press Ganey patient satisfaction surveys.
Scholarship and Research

- Nemours Cardiac Center engages in clinical, translational and basic research related to prevention, diagnosis and treatment of heart disease in children.
- Nemours Cardiac Center participates in selected clinical trials of the Pediatric Heart Network, created in 2001 by the National Heart, Lung and Blood Institute to improve outcomes and quality of life for children with heart disease.
- Nemours Cardiac Center collaborates with Johns Hopkins University as the Echocardiography Reading Center for the CARDIA and TODAY studies, two multicenter studies funded by NIH.
- Nemours has $11.6 million in external grants and clinical trials, and is ranked 14th in the nation for National Institutes of Health research funding among children’s hospitals.
- Nemours/Alfred I. duPont Hospital for Children is one of the founding partners of The Delaware Health Sciences Alliance (DHSA), along with Christiana Care Health System, Thomas Jefferson University and the University of Delaware.

Regional Services

- Cardiac evaluations and an extensive array of inpatient and outpatient services are available at Nemours/Alfred I. duPont Hospital for Children and satellite offices throughout the Delaware Valley.
- Nemours Cardiac Center has robust telemedicine capability used to provide consultation and education to physicians at distant sites.

“Our pediatrician told us Lucy needed to be in the very best place anywhere for treating heart problems – and this is it.”

–Kirsten, Lucy’s mother
When baby Lucy went for her two-week checkup, her pediatrician detected a heart murmur and told her parents to get her to Nemours Cardiac Center immediately. Within days she underwent a Norwood procedure, first of three surgeries for hypoplastic left heart syndrome, a condition in which the structures of the left side of the heart are underdeveloped and unable to pump blood adequately to the entire body. She underwent the second stage at 7 months and third and final stage at 13 months. She has sailed through catheterizations to place and enlarge stents as she has grown. Now an active, healthy 12-year-old, Lucy takes horseback riding lessons and plays volleyball, and is a voracious reader and honor roll student. “We loved the way the Cardiac Center is designed to allow us all to be together throughout her stay. Even now, when we go back to visit, it feels like family,” Kirsten says.
Consultation and Treatment Services

The integrated Nemours Cardiac Center team treats all pediatric cardiac conditions.
Services Provided

- management of congenital and acquired heart disease, including neonatal surgery and staged surgeries for single ventricle conditions
- treatment for heart failure
- mechanical circulatory support
- cardiac transplantation
- evaluation and treatment of heart murmurs, chest pain, syncope and arrhythmias
- diagnostic and therapeutic cardiac catheterization
- electrophysiology studies and ablations
- preventive cardiology services including treatment for hypertension/hyperlipidemia
- fetal cardiology
- electrocardiograms, echocardiograms, Holter monitoring
- exercise stress testing
- pediatric cardiac anesthesiology and critical care

Prenatal Diagnosis and Care Coordination

- Prenatal echocardiography is coordinated through the Nemours Partners for Perinatal Management Program, with pediatric cardiologists experienced in fetal ultrasound and prenatal diagnosis of congenital heart disease. Fetal echocardiograms can best define cardiac structures between 18 and 24 weeks gestation, although they can be done as early as 14 weeks.
- When a fetal cardiac abnormality is detected, duPont Hospital for Children cardiologists coordinate care to achieve the best possible outcome. We communicate the diagnosis and recommendations for postnatal cardiac treatment to the mother’s obstetrician and perinatologist, who continue to oversee her care. With this collaborative management, most women will deliver in their community hospital.
- The Cardiac Center is notified when labor begins and the hospital transport and Cardiac Intensive Care Unit teams stand by to transport and care for the baby, if appropriate, after delivery.
- In selected cases the mother may deliver at duPont Hospital for Children to enable the Cardiac Center team to care for the baby immediately after birth.
- We are the only hospital in Delaware to offer fetal MRI.

Noninvasive Cardiac Imaging

- The Nemours Cardiac Center Echocardiography Department has received a three-year accreditation for pediatric transthoracic echocardiography by the Intersocietal Commission for the Accreditation of Echocardiography Laboratories (ICAEL). This accreditation signifies the country’s highest level of achievement in the specialty.
- The Cardiac Center performs cardiac MRI, CT scanning, and nuclear perfusion studies, which in selected cases replace or supplement echocardiographic imaging or catheterization.
- Nemours Cardiac Center anesthesiologists provide anesthesia or sedation for infants and young children who are unable to cooperate while awake. Distraction techniques are utilized very effectively for older children undergoing imaging.
- In addition to providing timely reports to referring physicians, Nemours’ electronic health record system enables Nemours Cardiac Center specialists and referring physicians to easily exchange and view digital echocardiograms, cardiac MRI and CT images.
Cardiac Catheterization

- Nemours Cardiac Center’s catheterization laboratory enables cardiologists, cardiac surgeons, anesthesiologists and nursing teams to perform complex combined catheterization and surgical procedures using advanced imaging.
- Cardiac Center cardiologists use catheterization methods to treat atrial septal defects, PDAs, suitable muscular ventricular septal defects, and aortic and pulmonary valve abnormalities, avoiding open-heart surgery in many cases.
- Complication rates for therapeutic catheterizations are extremely low, with short fluoroscopy times.

Comprehensive Electrophysiology Care

- Nemours Cardiac Center electrophysiology specialists diagnose and treat simple and complex heart rhythm disturbances with technologies such as electrophysiology studies, radiofrequency ablations and cryoablations guided by three-dimensional heart mapping.
- Pacemaker and implantable defibrillator technology is utilized as indicated.
- Our electrophysiology specialists have reduced the fluoroscopy time during ablation to less than five minutes in most cases, significantly below the national average.
- Basic tests such as electrocardiography, tilt table testing and mobile heart monitoring are used to evaluate patients with syncope, chest pain and palpitations.

Cardiothoracic Surgery and Anesthesiology

- Cardiothoracic surgeons at Nemours Cardiac Center offer surgical treatment using the most up-to-date and innovative approaches for virtually all heart defects.
- We offer surgical repair for many heart abnormalities (e.g., patent ductus arteriosus, ventricular septal defect, truncus arteriosus, atioventricular canal defect, tetralogy of Fallot and transposition of the great arteries) with a single operation in early infancy.
- Nemours Cardiac Center has expertise in, and by contributions to medical literature, has advanced the management of single ventricle anomalies including the Fontan procedure.
- Nemours Cardiac Center’s specialized team of pediatric cardiac anesthesiologists provides anesthesia or deep sedation for patients having surgery, cardiac catheterization or other procedures, as appropriate.
- We participate in a national congenital heart surgery database organized by the Society for Thoracic Surgery. Nemours Cardiac Center surgeons meet or exceed national statistics particularly in newborn and infant heart surgery.

“Nemours Cardiac Center was wonderful. Everyone on the team was very professional and focused on making sure we had a good experience. We highly recommend Nemours to everyone.”

–Marilyn, Dalton’s mother
Dalton’s Story
TOWNSEND, DELAWARE

Dalton began experiencing tachycardia at age 8, but it wasn’t until he was 14 that it was captured on a mobile heart monitor and he was referred to Nemours Cardiac Center. The cardiologist recommended Dalton for cardiac ablation, a procedure in which small areas of the heart that cause the arrhythmia are destroyed. The electrophysiologist used computer-based technology to display a 3-D model of Dalton’s heart and electrical information that enabled him to locate anatomical landmarks, visualize the pattern of the arrhythmia and place catheters into blood vessels. The catheters were then used to deliver extreme heat to eliminate the source of the irregular heartbeat. Dalton’s successful ablation has cured the arrhythmia, and now at age 16 he is free to enjoy life with no restrictions. His passions include surfing and hunting.
Cardiac Transplantation/Mechanical Circulatory Support

- When cardiac transplantation is the best option, the Cardiac Center has the resources to support transplant recipients in the short-term and long-term. Our cardiologists and cardiac surgeons lead a team of intensivists, anesthesiologists, advanced practice nurses, registered nurses, physician assistants, pharmacists, physical and occupational therapists, nutritionists, social workers, and child life specialists to provide expert care for children and their families before, during, and after heart transplantation. Our transplant coordinator provides ongoing personal support to transplant patients and their families.
- Nemours Cardiac Center provides extracorporeal life support if required following surgery or for infants and children with severe, life-threatening cardiac failure. Nemours Cardiac Center specialists also are experienced in using ventricular assist devices (VADs) for mechanical circulatory support of patients with problems of the right, left or both ventricles as a bridge to cardiac transplantation or recovery.

Psychological and Neurodevelopmental Assessment

- Children who have undergone cardiac surgery may experience developmental delays, ADHD, or learning disabilities. We are committed to delivering the best possible functional outcome for our patients. The Neurodevelopmental Assessment After Cardiac Surgery Program assesses children on an ongoing basis up to age 3 to identify problems and allow early intervention. These assessments and recommendations are shared with the child’s primary care physician.

Expert Preventive Cardiology

- Cardiologists perform thorough cardiovascular evaluations for children with risk factors including overweight or obesity, hypertension, diabetes and lipid disorders.
- We obtain a complete medical and family history, conduct a comprehensive physical examination and perform appropriate laboratory tests. We then make recommendations for diet, exercise, lifestyle changes and, in some cases, medication to reduce a child’s risk for future cardiovascular disease. Our expertise in nutrition, exercise physiology, and behavior management techniques improves compliance with treatment recommendations.

“I never thought I would be capable of caring for a child with medical needs, but we are ok. When this little girl who might have died says, ‘I love you mommy,’ you realize how much she has touched so many lives.”

– Toni, Ahsya’s mother
Ahsya came into Toni and Brad’s life as a foster child when she was 1 day old, joining the couple’s three teenage boys. It soon became apparent that Ahsya had a serious heart problem, and they worried she might not live. She suffered from left ventricular noncompaction cardiomyopathy, a rare genetic disorder in which the wall of the heart’s left ventricle doesn’t completely develop, leaving it with a spongy appearance and diminished pumping ability. She spent many days in Nemours Cardiac Center, and when her condition could no longer be managed with medications, she was listed for transplant. Toni and Brad realized how much Ahsya needed them, and began the process of adoption. The adoption came through five days before her transplant.

“We spent five months in the Cardiac Center. The nurses took such good care of Ahsya and our whole family that I knew she was in good hands if I had to leave. Now she is entering the wonderful ‘terrible twos’ and we realize what a miracle she is. She makes us laugh every day,” Toni says.
Family Support

Caring for a child with heart disease can be very stressful for families. We strive to make this experience as easy as possible by offering accommodations and support that allow the family unit to remain together and functional. We focus on their physical, emotional, spiritual and social needs so they can focus on helping their child get well. Families tell us that the extra care and personal attention they receive from the entire Cardiac Center team has helped get them through this trying time.
Genetic Counseling

- Nemours Cardiac Center has established a Cardiovascular Genetics program. Our certified genetic counselor offers genetic counseling to patients and families when the etiology of a cardiac condition may have a genetic component, for example, aortopathies, cardiomyopathies and dyslipidemias. Providing further insight into the genetic cause of a condition frequently benefits the immediate and extended family as well as the patient.

- We analyze the family history, and obtain genetic testing for various cardiac conditions at laboratories that are leaders in cardiac genetics. We counsel families regarding inheritance, genetic testing, disclosure of test results, and the implications of a positive genetic test result.

Inpatient Units

- Nemours Cardiac Center has an 14-bed dedicated Pediatric Cardiac Intensive Care Unit to care for critically ill cardiac patients. Nurse to patient ratio in the CICU is generally one to one, and never less than one to two. For some, we provide two nurses for one child.

- Our 18-bed intermediate care and regular inpatient unit is equipped for telemetric monitoring of ECG and pulse oximetry. Regular inpatient rooms are private with a bath and designed for rooming-in by parents.

- Nurses in Nemours Cardiac Center use their many years of pediatric cardiac nursing experience to provide highly capable, compassionate care for patients and families.

Services and Accommodations for Patients and Families

- The Child Life and Creative Arts Therapy program helps to normalize the hospital environment by addressing the emotional, psychosocial and developmental needs the child and family may have throughout hospitalization. Child Life promotes effective coping through play, self-expression activities, and age-appropriate medical preparation and education.

- Private rooms with parental sleeping accommodations; a Family Resource Center with laundry facilities, a playroom, a kitchen, and a business center with a copier, fax machine, computers and printers; and free wireless Internet access are all available.

- Ronald McDonald House of Delaware with 50 affordable guest rooms and amenities for additional family members is located across Rockland Road from duPont Hospital for Children.

- Free parking and valet service are provided.

- Financial counseling and social workers are available for all patients.

- Palliative and pastoral care are there for patients and families in need.

- Online services include MyNemours, offering families access to their child’s records and physicians; patient and family education through KidsHealth and EmmiKids™; the GetWellNetwork, an interactive education, entertainment, and communication television network; and CaringBridge, a free Internet service for families to easily share information.
Electronic Health Records

- Nemours is among the elite one percent of U.S. hospitals to have implemented the electronic health record (EHR) and receive the Healthcare Information and Management Systems Society Stage 7 Award in 2011 for attaining the highest level of EHR adoption.
- Nemours Cardiac Center physicians who deliver care in outlying pediatric subspecialty clinics view up-to-date and accurate records of prior inpatient and outpatient treatment through a virtually paperless, efficient system that respects confidentiality and ensures privacy.

Community Hospital and Health System Collaboration

Nemours Cardiac Center collaborates with some of the region’s best hospitals and health systems to provide high-quality services to a greater number of children and families in their own communities. Our specialists are on call 24/7 for neonatal, inpatient and emergency consultations at these locations.

For a complete listing of our collaborative locations as well as our network of outpatient Nemours duPont Pediatrics locations, visit Nemours.org.

Referring a Patient

Our connected referral network enables us to quickly provide collaborative interaction for diagnosis. Swift evaluation results in timely recognition of critical disease and prompt initiation of subsequent treatment. Nemours Cardiac Center communicates with you throughout your patient’s care.

- **Telephone referrals, consults or transfers:** call our Physician Priority Line at (800) 829–KIDS (5437).
- **Online referrals:** you can submit online referrals and review your patients’ clinical information including outpatient visit notes, laboratory and imaging results, patient demographics, hospital discharge summaries, operative reports, inpatient medication lists and appointment history through NemoursLink, our secure physician portal. For more information about NemoursLink or to register, visit Nemours.org/nemourslink.
- **Physician to physician:** call Nemours Cardiac Center at (302) 651-6661.

Nemours Kids Transport

The Nemours Kids Transport program operates mobile intensive care units providing 24/7 air or ground transportation for seriously ill children from referring hospitals throughout the Delaware Valley to our hospital in Wilmington, Delaware. Our onboard team of pediatric critical care EMTs, nurses, and respiratory therapists communicates with the Cardiac Intensive Care team throughout the transport.

“The boys know they will have to watch their cholesterol throughout their lives. Fortunately we have a partner in Nemours Cardiac Center.”

—Colleen, Dylan’s mother
Dylan and Brendan are cousins who share a genetic disposition to high cholesterol. Tall and lean like their twin fathers, by age 9 they already had cholesterol readings in the 300-350 range, well above the acceptable limit of 170. Even though they are young, it is critically important to keep their cholesterol under control to avoid serious heart disease. Nemours Cardiac Center cardiologist Samuel Gidding, MD, an international researcher and expert on preventive cardiology, has managed the cousins for two years. Their treatment includes statin medications and EKG and blood work every six months to monitor cholesterol and liver function. He works with the boys’ mothers on the importance of a healthy, low-cholesterol diet and physical activity. “Dr. Gidding keeps us up to date on research about familial high cholesterol. Hopefully they will not have to go through the heart problems their fathers experienced during their youth. It makes you realize how precious life is and how important it is to take care of yourself,” Brendan’s mother Susan says.
Nemours/Alfred I. duPont Hospital for Children

Nemours/Alfred I. duPont Hospital for Children in Wilmington, Delaware, is part of a fully integrated system of care. Nestled among 300 acres of beautifully landscaped gardens, lush lawns and fresh air, our teaching hospital provides all the specialties of pediatric medicine, surgery and dentistry in a warm, family-centered environment.

Offering intensive and acute inpatient and outpatient services covering more than 30 pediatric specialties, duPont Hospital for Children is world-renowned for programs in blood and bone marrow transplantation, cardiology and cardiac surgery, genetics, orthopedics, and solid organ transplantation. The hospital is recognized by *U.S. News & World Report* for cancer, cardiology and cardiac surgery, gastroenterology, neonatology, nephrology, neurology and neurosurgery, orthopedics, pulmonology, and urology for 2012-2013.

We are academically affiliated with Thomas Jefferson University and the University of Delaware, and have the only Pediatric Trauma Center in Delaware.

Building a Healthier Future for Children

Opening in 2014, our expansion will create an environment to promote physical, emotional and spiritual healing. From the five-story atrium entrance to the interactive Discovery Zone to “nursing neighborhoods,” we are creating a children’s hospital like no other in the region. The expansion includes additional capacity in the Cardiac Intensive Care Unit as well as the intermediate care unit. For more information, visit Nemours.org/expansion.
“We try to make the experience for families dealing with the stress of congenital heart disease as easy and unencumbered as possible. We challenge ourselves every day to find innovative solutions and improve outcomes and to help families with the emotional, financial and social aspects of heart disease.”

– Christian Pizarro, MD
Director of Nemours Cardiac Center and Chief of Cardiothoracic Surgery

“Our integrated model combines all critical cardiac disciplines into one department, creating very high-quality care with a very clear mission. Everyone in the Cardiac Center wakes up in the morning and goes to sleep at night thinking about the best way to care for children with heart problems.”

– Samuel S. Gidding, MD
Chief of Cardiology and Director of Cardiac Outreach Programs
Nemours/Alfred I. duPont Hospital for Children has once again been ranked among the nation’s best in pediatric specialty care by *U.S. News & World Report*, with rankings in cancer, cardiology and heart surgery, gastroenterology, neonatology, nephrology, neurology and neurosurgery, orthopedics, pulmonology and urology.

**Best Doctors**

Eleven Nemours Cardiac Center physicians were named *Best Doctors in America®* 2013-2014. A total of 159 physicians from Nemours across all specialty areas were named *Best Doctors in America®* 2013-14.

**KidsHealth**

Parents, teens, and children can learn more about cardiac and other issues affecting children at KidsHealth.org, the world’s most visited website devoted to children’s health.

We encourage health care providers and parents to contact us to learn more about our cardiovascular care and services. Please call Nemours Cardiac Center at (302) 651-6600 or visit Nemours.org/cardiaccenter.