Heart Center

From performing the first surgical repair of patent ductus arteriosus and coarctation nearly 80 years ago, to successfully completing more than 150 closed fetal cardiac interventions in recent years, Boston Children’s Hospital’s Heart Center is both a historic leader and a modern innovator in pediatric cardiology and cardiac surgery.

Our center—the largest of its kind in the United States—encompasses the full spectrum of cardiac care. We are home to more than 25 subspecialties and an internationally renowned faculty that performs over 1,100 cardiac operations and 1,700 catheterizations every year. And with groundbreaking treatments like surgery for hypoplastic left heart syndrome, primary neonatal repair of transposition of the great arteries and successful in utero intervention for fetal aortic valve disease, we have dramatically improved survival rates for patients of all ages with congenital or acquired heart defects, including the rarest and most complex cases in the world.

Highlights in fiscal year 2011

- Ranked #1 in Cardiology and Heart Surgery by U.S. News & World Report in 2011-2012
- 78 cardiologists
- Seven cardiac surgeons
- 12 cardiac anesthesiologists
- 42 cardiology fellows
- Nine outpatient clinic locations
- 23,246 outpatient visits
- 41 beds in the inpatient cardiac unit
- 1,604 cardiology discharges, with a 3.65 case mix indicator
- 872 cardiac surgery discharges, with a 8.24 case mix indicator
- 29 beds in the cardiac intensive care unit
- Four catheterization labs and 1,316 catheterizations
- Three cardiac-only operating rooms
- 848 open heart surgeries with a 98 percent survival rate
- 841 closed heart surgeries with a 99 percent survival rate
- 11 heart transplants
- Two ventricular assist devices implanted
- One dedicated cardiac MRI suite and 1,185 cardiac MRIs
- 20,176 echocardiograms and 1,603 fetal echocardiograms

Research

For more than 50 years, Boston Children's has pioneered cardiovascular solutions that have dramatically improved survival rates and the quality of life for children born with heart defects.

Our Heart Center attracts major research support from granting agencies, including the National Institutes of Health and the American Heart Association. It has the nation’s most intensive clinical and basic research program focused on pediatric heart disease, and is an innovator in translational research, bringing laboratory discoveries to the bedside as quickly as possible.

Training

The fellowship programs of the Heart Center train academically oriented leaders in the clinical care and laboratory and clinical investigation of pediatric cardiovascular disease. Fellowships are offered in Pediatric Cardiology and Cardiovascular Research, Cardiac Anesthesia and Pediatric Cardiac Surgery.

The Congenital Heart Surgery Observership Course provides participants with extensive exposure to advanced surgical techniques used for repair of congenital heart malformations, including cardiopulmonary bypass techniques and variations, minimally-invasive techniques, robotic procedures and hybrid techniques.

childrenshospital.org/heartedu

Scheduling

Boston Children's Hospital
300 Longwood Avenue
Boston, MA 02115
childrenshospital.org/heart

Department of Cardiology
617-355-HART
cvp@cardio.chboston.org

Department of Cardiac Surgery
857-218-3580
cardiacsurg@cardio.chboston.org

International

For families residing outside of the United States, please contact Boston Children’s International Center.
01-617-355-5209 | childrenshospital.org/international

Research

For more than 50 years, Boston Children's has pioneered cardiovascular solutions that have dramatically improved survival rates and the quality of life for children born with heart defects.

Our Heart Center attracts major research support from granting agencies, including the National Institutes of Health and the American Heart Association. It has the nation’s most intensive clinical and basic research program focused on pediatric heart disease, and is an innovator in translational research, bringing laboratory discoveries to the bedside as quickly as possible.

Training

The fellowship programs of the Heart Center train academically oriented leaders in the clinical care and laboratory and clinical investigation of pediatric cardiovascular disease. Fellowships are offered in Pediatric Cardiology and Cardiovascular Research, Cardiac Anesthesia and Pediatric Cardiac Surgery.

The Congenital Heart Surgery Observership Course provides participants with extensive exposure to advanced surgical techniques used for repair of congenital heart malformations, including cardiopulmonary bypass techniques and variations, minimally-invasive techniques, robotic procedures and hybrid techniques.

childrenshospital.org/heartedu
Clinical programs

Boston Adult Congenital Heart Service
Offers long-term care and advanced therapeutic options for adolescents and adults with congenital heart disease.
617-355-6508 | childrenshospital.org/bach
bach@cardio.chboston.org

Cardiac Electrophysiology Service
Specializing in catheter ablation, pacemaker and defibrillator implant and management of genetic arrhythmias, the program is one of the world’s largest for pediatric arrhythmia care.
617-355-6328 | childrenshospital.org/electrophys
ep@cardio.chboston.org

Cardiac Neurodevelopmental Program
Cares for children with heart problems who are at higher risk for developmental, learning and behavioral problems.
617-355-3401 | childrenshospital.org/cnp

Cardiac Surgery
Sees more patients with complex heart disease than most centers in the world, offering the most innovative care with superior long-term outcomes. One key surgical innovation involves achieving biventricular circulation in patients with borderline hypoplastic left or right heart lesions previously managed with conventional single ventricle palliation.
617-355-7932 | childrenshospital.org/cardiacsurgery
cardiacsurg@cardio.chboston.org

Cardiomyopathy Program
Provides advanced diagnostic and therapeutic options for infants, children and adolescents diagnosed with cardiomyopathy.
617-355-6329 | childrenshospital.org/cardioamyopathy

Cardiovascular Genetics Program
Provides clinical care, information and resources for patients and families with a cardiac diagnosis in the setting of a recognized or suspected genetic condition or a family with inherited cardiovascular disease.
617-355-2079 | childrenshospital.org/cardiacgenetics
cardiacgenetics@cardio.chboston.org

Congenital Heart Valve Program
Continues to develop innovative catheter-based and surgical approaches for the preservation and restoration of valvular function in infants, children and young adults. The program emphasizes valve repair over replacement in many patients, with attendant benefits. Referrals include patients with complex congenital mitral disease, regurgitant or mixed aortic valve disease and Ebstein’s anomaly of the tricuspid valve.
617-355-7932 | childrenshospital.org/heartvalve

Fetal Cardiology Program
To date, Boston Children’s has performed more than 150 closed fetal cardiac interventions; we remain the largest and most experienced fetal cardiac intervention program in the world. Our interventions include mid-gestation fetal aortic valvuloplasty to prevent in utero progression of aortic stenosis to hypoplastic left heart syndrome, fetal pulmonary valvotomy to promote right heart growth in pulmonary atresia with intact ventricular septum and fetal atrial septostomy in hypoplastic left heart syndrome with intact or highly restrictive atrial septum.
617-355-1499 | childrenshospital.org/fetalheart
fetalcardio@cardio.chboston.org

Heart Transplant Program
Evaluates children who are potential candidates for transplantation and manages the care of those who have received transplanted hearts. In 2011, the program performed 11 donor heart transplants and implanted two assist devices.
617-355-6329 | childrenshospital.org/hearttx
hearttransplant@cardio.chboston.org

Interventional Catheterization Program
Leads the field of catheter-based treatment with 800 interventional procedures among a total of 1,300 catheterizations annually. We deploy both technical and strategic innovations in the management of an increasingly broad range of indications. These approaches complement surgical management in many cases, and obviate the need for surgery in many others.
617-355-7672 | childrenshospital.org/cath
cardiaccath@cardio.chboston.org

Kawasaki Disease Program
Coordinates care for patients with Kawasaki disease, both during the acute phase and in long-term follow-up. We see 50 new patients each year and have more than 1,400 patients in our long-term program.
617-355-2079 | childrenshospital.org/kawasaki
kawasaki@cardio.chboston.org

Lung Transplant Program
Performs transplantation and provides comprehensive care for children with pulmonary hypertension, pulmonary vein stenosis and other end-stage cardiovascular and lung diseases. Since the program’s inception in 1990, 63 bilateral, single and heart-lung transplants have been performed, making ours one of the busiest pediatric lung transplantation centers in the country.
617-355-6681 | childrenshospital.org/lungtx
hearttransplant@cardio.chboston.org

Preventive Cardiology Program
Provides services to children aimed at identifying and medically managing cholesterol and blood pressure problems early in life, with the goal of preventing heart attack or stroke later in life.
617-355-0955 | childrenshospital.org/preventivecardio
preventivecardio@cardio.chboston.org

Pulmonary Hypertension Program
Provides diagnosis and a range of treatment options for patients with pulmonary hypertension.
617-355-7866 (information) | 617-355-2079 (scheduling)
childrenshospital.org/pht | pht@cardio.chboston.org

Pulmonary Vein Stenosis Program
Provides care to patients diagnosed with pulmonary vein stenosis, utilizing a multidisciplinary team of doctors and nurses with expertise in the fields of cardiology, radiology, pathology and neuro-oncology.
617-355-2079 | childrenshospital.org/pvs
pvs@cardio.chboston.org

Services

- Cardiac anesthesia
- Cardiac ECMO Center
- Exercise physiology laboratory
- Non-invasive cardiac imaging
- Stress echocardiography
Data and outcomes
Cardiac Catheterization Program

Catheterization procedures

Heart transplants by age

Age of patient
## Heart Center

### Data and outcomes

#### Cardiac Surgery


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Open heart</td>
<td>2,148</td>
<td>97%</td>
<td>2,498</td>
<td>98%</td>
</tr>
<tr>
<td>Closed heart (excludes premature PDAs)</td>
<td>1,246</td>
<td>99%</td>
<td>1,230</td>
<td>99%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>3,394</strong></td>
<td><strong>98%</strong></td>
<td><strong>3,728</strong></td>
<td><strong>98%</strong></td>
</tr>
</tbody>
</table>

#### Selected Procedures (30-day survival rates)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial septal defect (ASD)</td>
<td>180</td>
<td>100%</td>
<td>196</td>
<td>100%</td>
</tr>
<tr>
<td>Ventricular septal defect (VSD) with or w/out arch reconstruction</td>
<td>207</td>
<td>98%</td>
<td>232</td>
<td>100%</td>
</tr>
<tr>
<td>Arterial Switch (ASD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASO with VSD</td>
<td>32</td>
<td>97%</td>
<td>55</td>
<td>98%</td>
</tr>
<tr>
<td>ASO TGA/IVS</td>
<td>85</td>
<td>98%</td>
<td>49</td>
<td>98%</td>
</tr>
<tr>
<td>ASO Double Switch</td>
<td>16</td>
<td>100%</td>
<td>22</td>
<td>95%</td>
</tr>
<tr>
<td>Repair of total anomalous pulmonary venous return</td>
<td>24</td>
<td>92%</td>
<td>33</td>
<td>97%</td>
</tr>
<tr>
<td>Repair truncus arteriosus with or w/o arch repair</td>
<td>17</td>
<td>88%</td>
<td>13</td>
<td>92%</td>
</tr>
<tr>
<td>Norwood - stage I</td>
<td>83</td>
<td>86%</td>
<td>64</td>
<td>88%</td>
</tr>
<tr>
<td>Bi-directional Glenn - stage II</td>
<td>101</td>
<td>100%</td>
<td>91</td>
<td>99%</td>
</tr>
<tr>
<td>Fontan - stage III</td>
<td>145</td>
<td>99%</td>
<td>118</td>
<td>97%</td>
</tr>
<tr>
<td>Repair AV canal, complete</td>
<td>97</td>
<td>99%</td>
<td>105</td>
<td>96%</td>
</tr>
<tr>
<td>Repair AV canal, partial</td>
<td>59</td>
<td>100%</td>
<td>65</td>
<td>100%</td>
</tr>
<tr>
<td>Aortic valve repair</td>
<td>53</td>
<td>98%</td>
<td>91</td>
<td>100%</td>
</tr>
<tr>
<td>Mitral valve repair</td>
<td>91</td>
<td>99%</td>
<td>128</td>
<td>99%</td>
</tr>
<tr>
<td>Tetralogy of Fallot (pulmonary stenosis or atresia)</td>
<td>169</td>
<td>98%</td>
<td>157</td>
<td>99%</td>
</tr>
<tr>
<td>Sub aortic stenosis</td>
<td>57</td>
<td>100%</td>
<td>54</td>
<td>100%</td>
</tr>
<tr>
<td>Pulmonary valve insertion</td>
<td>113</td>
<td>100%</td>
<td>230</td>
<td>100%</td>
</tr>
<tr>
<td>Right ventricle to pulmonary artery conduit</td>
<td>82</td>
<td>100%</td>
<td>64</td>
<td>98%</td>
</tr>
<tr>
<td>Ebstein's anomaly/cone operation</td>
<td>12</td>
<td>100%</td>
<td>44</td>
<td>100%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,623</strong></td>
<td><strong>97%</strong></td>
<td><strong>1,811</strong></td>
<td><strong>98%</strong></td>
</tr>
</tbody>
</table>