About AIMS:

Pediatric cardiac surgery division

The division of pediatric cardiac surgery at Amrita is one of the leading centres in India and is dedicated to providing a better quality of life for infants, children and adolescents through excellence in clinical practice. Proud winners of the BMJ Award 2014 for quality improvement in healthcare, the pediatric heart program at AIMS delivers sophisticated care with uncompromising quality and results on par with the best centers worldwide.

Complex Neonatal Heart Surgery

The expertise and specialized knowledge required to diagnose heart diseases prenatally complimented by prompt recognition and management of newborns with complex heart disease has seen many of these children referred to Amrita for sophisticated surgical repair without which they would succumb. Even children under 7 days of age and weighing just 1.5 kg to 3kg undergo corrective surgeries with excellent success rate at AIMS. The post-operative course of these children is very demanding and exacting as these critical hearts recover their normal function.

Such surgeries include:-

1. ALCAPA repair, where one of the vessels supplying the heart (coronaries) abnormally arises from the vessel of the lungs (pulmonary artery) leading to severe heart failure and muscle damage. Surgery involves translocating these microscopic vessels back to the aorta.

2. Arterial Switch Operation (ASO): Transposed great vessels (TGA) is a condition where the aorta and pulmonary arteries are congenitally "switched" and arising from the opposite sides of the heart compared to normal hearts, leading to a life threatening situation with hardly any blood flow to the body. The complex surgical procedure ASO aims at shifting these vessels back to their correct sides.

3. Neonatal Coarctation of aorta is another condition where the heart is extremely weak due to severe obstruction of the aorta, the vessel which supplies blood to the body. Most often, these children are extremely sick with severe renal damage, sepsis and failing organ systems. Surgery involves removing the obstruction and recreating a good outflow system.

4. Obstructed TAPVC is another critical heart disease. The purified blood from the lungs fails to return to the body due to an abnormal connection to the heart. These children would succumb within days if not operated on immediately to correct the abnormal connections.

5. Neonatal BT Shunt & PA Band surgeries are another group of demanding surgeries requiring even more demanding post-operative ICU care and are aimed at palliating certain types of heart disease called "Single ventricle Physiology" and bridge the gap to final palliative surgeries called BDGS & Fontan procedures.

6. The Norwood palliation for HLHS is the pinnacle of any pediatric cardiac program's achievement and Amrita has an outstanding success record in this surgery. The surgery aims at recreating a near non-existent circulatory pathway to the body from the heart and is easily the most demanding and challenging prospect for any pediatric heart program to manage & deliver. Not only does AIMS have the distinction of excellent success rates for Norwood procedure, it also in one of the few to see children of HLHS undergoing the final stage

Fontan completion procedure. It was also here at AIMS that Kerala's first Norwood procedure was performed.

The successful treatment of these critical neonatal heart condition demands skilled surgical technique, dedicated, intense and prolonged post operative care and is a drain on the finance of the family involved. Amrita takes pride in offering such care and support to these families.

Minimally Invasive & Cosmetic Cardiac Surgery

In line with the department's outlook, innovative and difficult surgical techniques are embraced with aplomb by the pediatric division too, delivering cosmetic surgical approaches to common congenital heart conditions. These include limited posterolateral thoracotomy approach, axillary approach and ministernotomy approach.

Extensive experience in these demanding techniques enables our team to offer these surgeries with the same results as their corresponding conventional techniques. Ministernotomy approach involves making a small incision on the midline over the breastbone (sternum) and diving only a part of the sternum to approach the heart. AIMS performs ASD, VSD, mitral valve repairs and ICR for tetralogy of Fallot (TOF) with this approach.

Valve repairs

The normal functioning of the valves of the left side of the heart, aortic valve and mitral valve, is critical to the normal development of the child and the heart. Congenital diseases of the aortic valve causing valve obstruction (stenosis) or leakage (regurgitation) include critical aortic stenosis of the newborn, bicuspid aortic valve, connective tissue disorders like Marfan's syndrome leading to leaking aortic valve and rheumatic heart disease. Similar pathologies occur in the mitral valve (MV) too like parachute MV, hammock MV, supramitral membrane, congenital mitral stenosis, Barlow's disease, MV prolapse etc.

Replacement of these valves, as is often done in adults, is not a treatment option in children. This is because artificial valves of such small sizes are not available, and even if they were, they would need to be changed regularly to larger sizes in line with the child's growth which means exposing these children to multiple high risk surgical procedures. Herein lies the importance of successful valve repair, preserving the child's natural valves in acceptable functioning condition for as long as possible.

We at Amrita perform repairs of the mitral and aortic valves. In severely damaged aortic valves, the ***Ross procedure*** is performed, using the child's own pulmonary valve as a replacement for the aortic valve.

Conduit repairs are offered for diseases of the pulmonary valve wherein artificial tubes with valves in-situ are used to connect the right sided heart pump to the artery of the lungs (pulmonary artery) thus bypassing the defective pulmonary valve of the baby.

The other right-sided valve of the heart, Tricuspid valve, can also be affected by diseases causing leaks or obstructions. Tricuspid valve repair is regularly performed at AIMS with good results. ***Neonatal Ebstein's anomaly*** is a rare condition leading to death in the majority of children due to limited treatment options for these extremely sick hearts. Amrita is one among just a handful of centers in the country where corrective surgery for this condition is offered.

Redo operations for multi-stage pediatric cardiac operations

A large percentage of the children operated at Amrita are for "redo" procedures. These complex surgeries are done in such large numbers here probably because of the selective referral of such complex conditions to AIMS. These surgeries involve re-entry into the chest after a previous surgery and are fraught with danger due to the heart and lungs being stuck to the chest wall after the first heart surgery.

Such procedures are usually for

1. Inserting an artificial pulmonary valve in a previously corrected "tetralogy of Fallot (TOF)".

2. The next stage of surgery in certain multi-stage surgeries like single-ventricle palliations.

3. Change of dysfunctional conduits in a patient with a previous conduit insertion.

4. Rare 2- ventricle conversions in a child operated on for single ventricle palliation and later found to be fit for a 2-pump system like normal hearts.

Heart Conditions we Treat :-

We treat children with a range of heart conditions present at birth (congenital) and acquired after birth.

1. ALCAPA
2. Aortic Stenosis
3. Atrial Septal Defect
4. Atrioventricular Septal Defect (AV Canal)
5. Bacterial Endocarditis
6. Coarctation of Aorta
7. Cortriatum Repair
8. Double outlet right ventricle (DORV)
9. Ebstein's anomaly
10. Hypertrophic Cardiomyopathy (HCM)
11. Hypoplastic Left Heart Syndrome (HLHS)
12. Interrupted aortic arch
13. Congential mitral stenosis and regurgitation
14. Partial and total anomalous pulmonary venous connectoion
15. Patent ductus arteriosus (PDA)
16. Pulmonary atresia & stenosis
17. Redo surgeries for pulmonary valve implantation & conduit changes
18. Ross Procedure
19. Single ventricle
20. Tetrology of Fallot
21. Tricuspid Atresia

22. Truncus arteriosus

23. Unifocalization

24. Ventricular Septal Defect