

What are the risks associated with the surgery?

The benefits of the surgical intervention outweigh the risks. The major risks include: risk to life, neurological abnormality, arrhythmia (irregular heart beat – which sometimes may require insertion of a permanent pacemaker), renal dysfunction (may require dialysis – temporary or very unlikely permanent), and bleeding/infection. The surgical team will discuss regarding the possible risks and benefits of operation.

How do I prepare my child for surgery?

Once the surgical date is fixed, your child will be admitted a day before for pre-operative preparation such as taking blood, chest x-ray, ECG etc. A tour of the pediatrics intensive care unit can be arranged, prior to surgery.

What happens during the surgery?

You will be allowed to accompany your child into the operating theatre. Your child will either be injected with or inhale in an anesthetic agent to put him/her to sleep. Once your child is asleep, you will be asked to leave the operating theatre. The anesthetist will then insert a breathing tube and various drips. The time taken for surgery will depend on the complexity of the procedure. It could take as quick as 1 hour and as long as 6 hours. You will be notified once the procedure is completed.

What happens after the surgery?

- Your child will be transferred to paediatric intensive care unit after the operation.
- There will be many tubes connected to your child for various purposes.
- As every patient is different, the staff will discuss with you regarding your child's hourly/daily progress and treatment plans.
- When your child is more stable, he/she will then be transferred to High Dependency Unit (HDU) for further close monitoring for 1 or 2 days. When your child is stable enough, he/she will be transferred to the General Paediatric Ward where most of the recovery would take place.
- After discharge, you will bring your child back for review by both the cardiologist and the surgeon within 2 to 3 weeks.

Contact information

Department of Cardiac, Thoracic and Vascular Surgery
Main Building 1, Level 2

Opening Hours: 8.30 am - 6.00 pm (Mon - Fri)
(except on Public Holidays)

For appointments, please contact

Tel: (65) 6772 2002
Email: appointment@nuh.com.sg

For International Patients And Visitors

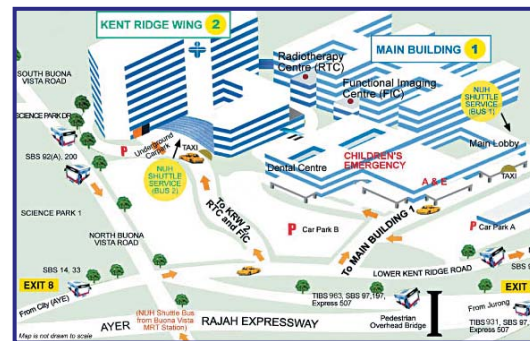
The International Patients Liaison Centre (IPLC) is a one-stop service centre to support all the medical needs of our foreign patients

Tel : (65) 6779 2777 (24-Hours Helpline)
Fax : (65) 6777 8065
Website : www.nuh.com.sg/iplc.html

National University Hospital

5 Lower Kent Ridge Road, Singapore 119074
Tel: 6779 5555 Fax: 6779 5678 Website: www.nuh.com.sg

Location



Free Shuttle Bus Service

Free Shuttle Bus Service from Dover MRT Station to NUH

Operation hours : 8.00 am – 8.30 pm (Mondays – Fridays)
8.00 am – 2.00 pm (Saturdays)
Not available on Sundays and Public Holidays

Dover/NUH passenger pickup/ drop off point

1. Dover MRT Station (opposite Singapore Polytechnic)
2. Main Building, Lobby Entrance (near roundabout)
3. Kent Ridge Wing, Level 3, South Entrance

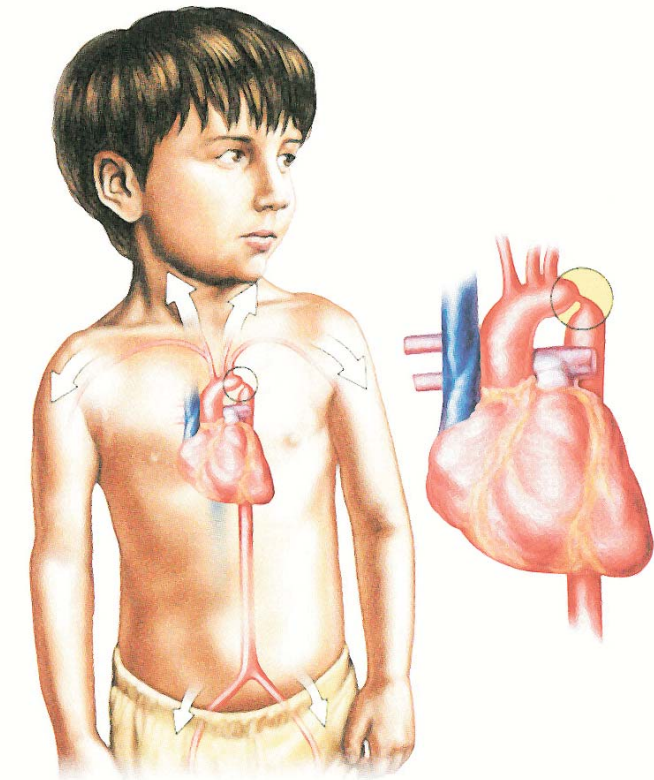
For more information on Shuttle Bus schedule, log on to www.nuh.com.sg

Information in this brochure is given as a guide only and does not replace medical advice from your doctor. Please seek the advice of your doctor if you have any questions related to the surgery, your health or medical condition.

Information is correct at time of printing (Aug 2009) and subjected to revision without notice.



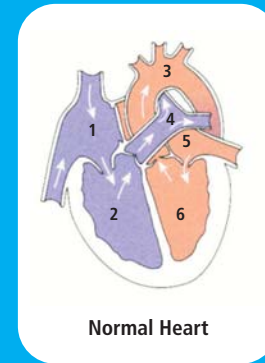
Surgery for Paediatric Congenital Heart Diseases



How does a normal heart work?

The heart has four chambers (two atria and two ventricles) and four valves (the tricuspid and pulmonary on the right side of the heart, and the mitral and aortic on the left side of the heart). Blood circulates throughout the body and returns to the heart in the **right atrium**. It then passes through the **tricuspid valve** to get to the **right ventricle** and then through the **pulmonary valve** to get to the **pulmonary artery**, which takes the blood to the lungs. In the lungs, the blood gets oxygenated and returns to the heart in the **left atrium**. It then passes through the **mitral valve** to the **left ventricle**. From there, it is pumped out of the **aortic valve** to the **aorta**, which carries the blood to the body.

When blood circulates abnormally because of a defect, mixing of oxygenated and deoxygenated blood occurs. This results in blood flow with a decreased amount of oxygen or cyanosis (blueness of the skin or nails). In mild forms, children may look ruddy. In severe cyanosis, the child may look dark blue.



Normal Heart

How is it diagnosed?

Some of the congenital defects are diagnosed antenatally (before birth). If this is the case, a plan can be fully discussed with parents and appropriate treatment can be considered as soon as the child is born.

Some of the conditions are diagnosed soon after birth due to abnormality in routine tests while other defects may only be diagnosed later on in the child's life.

Common tests used for diagnosis of CHD:

- Electrocardiogram (ECG)
- 2D ECHO Cardiogram
- Cardiac Catheterisation
- Cardiac Magnetic Resonance Imaging (CMR)

What is congenital heart disease (CHD)?

A congenital heart defect is a malformation of the heart existing at birth. There are many different types of CHD. Common congenital defects can be divided into following categories:

- Obstruction to blood flow – any structure of heart valves or major blood vessels that are abnormal can block the flow of blood e.g.
 - ❖ congenital aortic stenosis, mitral valve stenosis, pulmonary valve atresia/stenosis, Absent Pulmonary Valve Syndrome, Coarctation of aorta, interrupted aortic arch, etc.
- Left to right shunt – blood flows from left side of heart into right side of heart, resulting in overloading of right side of heart and too much blood flowing into lungs e.g.

- ❖ Patent Ductus Arteriosus (PDA), Septal Defects – Atrial and Ventricular Septal Defects, Endocardial defect, Aorto-Pulmonary Window.

- Right to left shunts (cyanotic defects with decreased flow to lung)
 - ❖ Tetralogy of Fallot, Pulmonary Atresia with intact VSD, Pulmonary atresia with VSD, Tricuspid Atresia, Ebstein's Anomaly.
- Complex Cyanotic Defects ("mixing defects")
 - ❖ Double Outlet Right Ventricle, Univentricular heart, Total Anomalous Pulmonary venous connection, Truncus Arteriosus, Hypoplastic Left Heart Syndrome.

Medical and surgical treatment now offers these children an opportunity to grow and mature into adult life, an option that once was not available in the past.

How is it treated?

In some cases, CHD may be life-threatening and must be surgically corrected within a few days or even hours after birth. In other cases, the operation can be carried out after a few months or years.

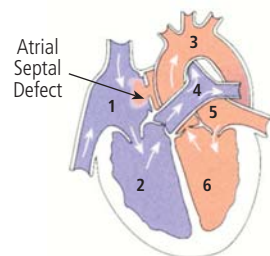
Sometimes, it is necessary to repair the defect in stages. It may involve putting in a temporary shunt to redirect the blood flow so that your child can grow bigger and stronger before carrying out a definitive procedure.

What are the common paediatric heart surgical procedures?

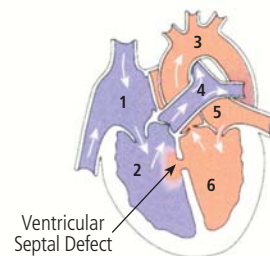
Heart defects that are fixed during surgery are grouped into two categories: open and closed heart surgery.

- Closed heart surgery implies that the "heart lung machine" or "bypass" machine is not used and the heart is visualized but not cut open.
- Open heart surgery implies that the heart needs to be opened for surgery and therefore the "cardiopulmonary bypass (CPB)" machine is used to oxygenate and circulate the blood without using the heart or lungs.

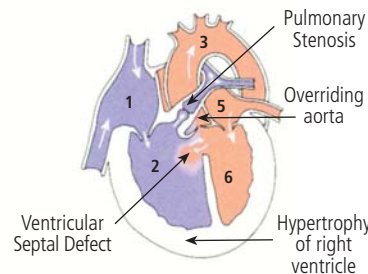
1. Right atrium
2. Right ventricle
3. Aorta
4. Pulmonary artery
5. Left atrium
6. Left ventricle



Atrial Septal Defect



Ventricular Septal Defect



Tetralogy of Fallot