THE HEART OF THE MATTER

Centre of Excellence:
Cardiac Sciences

Heart disease is the leading cause of death worldwide and the death toll continues to rise. Heart disease cases nearly doubled over the period – from 271 million in 1990 to 523 million in 2019; and the number of heart disease deaths rose from 12.1 million to 18.6 million. The majority of heart disease deaths were attributed to ischemic heart disease and stroke, with a steady increase from 1990.

In the African continent too, the burden of heart diseases is rapidly increasing. The pattern of cardiovascular diseases in Sub-Saharan Africa is unique, including uncorrected congenital heart defects, persistence of conditions associated with poverty and infections (rheumatic heart disease, endomyocardial fibrosis and cor pulmonale due to schistosomiasis), emergence of diseases related to changes in living habits (hypertension and stroke, ischemic heart disease) and diseases associated to the HIV infection (tuberculous pericarditis, pulmonary hypertension and cardiomyopathy).

According to the World Health Organization Committee for Africa, arterial hypertension, stroke, cardiomyopathies and rheumatic heart disease are important cardiovascular diseases in adults in Sub-Saharan Africa. On the other hand, African children have high prevalence of rheumatic heart disease, cardiomyopathy and untreated congenital heart disease.

At Mediheal Group of Hospitals, we understand that heart disease is unique to each patient, so we tailor treatment plans according to specific cardiology needs. Our goal is to deliver high-quality heart care that will help our patients lead active lives. We are at the forefront of providing the most comprehensive and technologically advanced cardiology care services through our chain of healthcare facilities across the African continent.

Be it a chest pain, high cholesterol related issues, valve replacement or heart complications that require complex surgical expertise, our team of experienced cardiologists is able to effectively diagnose and treat a wide range of conditions. The team holds expertise in the treatment of the heart and its diseases using diagnostics and medication to offer the most comprehensive care in cardiology.

The Cardiology Department at Mediheal Group of Hospitals is managed by a dedicated team of cardiologists, interventional cardiologist and well-trained supporting staff. Our team focuses on holistic approach to cardiac care through various non-invasive and invasive diagnostic and therapeutic services. Our cardiologists are dedicated to researching the latest heart care technology, to offer our patients the best in cardiovascular care to help them achieve faster recovery and best outcomes possible.

> **“We have been leading the healthcare segment with high-quality medical services and have participated in inspiring improvements with our patients in mind.”**

Africa is the world's second-largest and second-most populous continent. With more than 1.3 billion people, it accounts for about 16% of the world's human population. Despite a long and complex history and a large diversity of ethnicities, the continent is growing very fast in every aspect in tandem with the rest of the modern world.

Mediheal Group of Hospitals has been at the forefront of providing high-quality medical care and we have contributed immensely to improving the healthcare segment of the continent. The credit for this however lies with the population, who have exhibited their trust in us to serve with our credible ever-growing presence across the continent.

As far as cardiovascular diseases (CVDs) are concerned, they are the most frequent causes of non-communicable disease (NCD) deaths, responsible for approximately 13% of all deaths and 37% of all NCD deaths in Sub-Saharan Africa. Heart failure has also become a dominant form of CVD in Africa, where it affects young economically active individuals. CVD death rates in Africa may still be less than observed proportions in high-income regions but on an average, occur at younger ages than in the rest of the world. This poses a significant social challenge in most of the countries in the continent.

Risk for CVD varies across different populations, including race/ethnicity, age and gender. With increasing incidence of life-threatening scenarios at home and workplace with heart disease as the leading culprit, a proactive approach to heart-healthcare is needed. An important aspect of lowering risk of cardiovascular disease is managing health behaviours and risk factors, such as diet quality, physical activity, smoking, body mass index (BMI), blood pressure, total cholesterol or blood glucose.

As a responsible healthcare services provider, we at Mediheal Group of Hospitals focus on utilising heart screening & cardiac tests for proactive healthcare, and put greater emphasis on early detection and prompt treatment. Regular heart screenings and cardiac tests help greatly in detecting early silent killers like hypertension, high cholesterol and other heart diseases.

At Mediheal Group of Hospitals, we aim to keep expanding with new facilities and continue the momentum as one of the fastest growing healthcare groups in Africa. We are constantly looking to attract highly-qualified medical professionals, who live up to the high standards we set for ourselves. We always procure state-of-the-art equipment that is being used across the world, and make sure that our critical care diagnostic and treatment capacities meet international standards for accuracy and reliability.

We have built our healthcare delivery support system in a way that services in a seamless manner. We will continue to evolve to serve the larger cause of the African continent and we are more than confident that with the continuous support from the respective local government authorities, we will always be at the forefront of precise healthcare delivery in the African continent, including in the field of cardiology.

Dr. S. R. Mishra
MS - Obstetrics & Gynaecology (India)
Dip. Gynae Endoscopy (Germany)
Chairman, Mediheal Group

> **“As Chief Cardiac Surgeon of Mediheal Hospital, I perform surgeries on both adults and children including heart revascularization, treatment of congenital abnormalities and other diseases of the vascular systems.”**

Cardiovascular diseases (CVDs) are the number one cause of death globally: more people die annually from CVDs than from any other cause. Over three quarters of CVD deaths take place in low- and middle-income countries. Most cardiovascular diseases can be prevented by addressing behavioural risk factors such as tobacco use, unhealthy diet and obesity, physical inactivity and harmful use of alcohol using population-wide strategies. People with cardiovascular disease or who are at high cardiovascular risk, need early detection and management using counselling and medicines, as appropriate.

I am a senior cardiothoracic, vascular surgeon with over 15 years of experience. As Chief Cardiac Surgeon of Mediheal Hospital, I perform surgeries on both adults and children including heart revascularization, treatment of congenital abnormalities and other diseases of the vascular systems.

My special area of interest include total arterial revascularization using bilateral internal mammary arteries, minimally invasive cardiac surgery, pulmonary thromboendarterectomy, hybrid procedures and surgeries for complex aortic aneurysms and dissections, extra-corporeal membrane oxygenation (ECMO), Ross procedure and homograft valve replacements.

I joined Narayana Health (NH) after completing an advanced training in cardiothoracic and vascular surgery. I worked as a Junior Consultant at Narayana Health, Bangalore, and as a Consultant at the Health City Cayman Islands, Grand Cayman. I also worked as Consultant and Chief Cardiac Surgeon at Shree Mata Vaishnodevi Narayana Superspeciality Hospital, Katra, Jammu, India.

Dr. Sumit J. Modi
Ms (Gen. Surgery), DNB (Cardiovasular and Thoracic Surgery)
Director & Senior Consultant- Cardiovascular and Thoracic Surgery

> **At Mediheal Group of Hospitals, we provide tailor-made treatment plans according to specific cardiology needs. We are at the forefront of providing the most comprehensive and technologically advanced cardiology care services through our chain of healthcare facilities across the African continent.**

Africa is home to >1 billion people and is a major contributor to the global burden of cardiovascular diseases (CVDs). In many regions of Africa, the burden of cerebrovascular disease, cardiomyopathies and rheumatic heart disease still predominate. In more affluent regions, hypertensive heart disease and related heart failure predominates. Compared with the global burden of CVD, affected Africans are typically younger, predominantly female and mostly from disadvantaged communities.

I have worked and have been trained in cardiology in Narayana Hrudayalaya Hospital, Bangalore, India. During extensive training, I earned expertise in the management of coronary artery disease [done nearly 2300 coronary diagnostic angiograms, 700 elective simple and complex interventions (CTO, SVG interventions, bifurcation interventions, coronary angioplasties, 134 primary angioplasties], structural heart disease interventions [83 balloon mitral valvuloplasties, 9 pulmonary valvuloplasties, 4 coarctoplasties, 30 ASD & PDA device closures], 35 pacemakers and ICDs under the guidance of senior consultants.

I have also assisted 6 aortic stent graft procedures and 34 TAVI procedures. I have done a few peripheral vascular interventions also. I was part of heart failure team and pulmonary thromboembolism team under Dr. George Cherian. I hold expertise in doing interventional cardiac work and non-invasive cardiac work like regular 2D echocardiography, transoesophageal echo, dobutamine stress echo, stress test, interpretation of Holter monitoring. I am sound in managing all cardiac emergencies.

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Dr. Vijaysinh Namdeo Patil
MD, DNB (Cardiology), FNB, FCCAI (USA)
Director Cath Lab and Senior Consultant
- Interventional Cardiology

> **“I perform Cardiothoracic and Vascular operations on adults and children including heart revascularization, treatment of congenital abnormalities and other diseases of the chest and the vascular systems.”**

The field of vascular surgery is evolving in Sub-Saharan Africa and most countries now have the resources to provide optimal cardiac surgery care.

I am an Assistant Surgeon/Fellow Cardiothoracic and Vascular Surgeon with over 10 years' experience in Cardiothoracic Surgery. I perform Cardiothoracic and Vascular operations on adults and children including heart revascularization, treatment of congenital abnormalities and other diseases of the chest and the vascular systems. I earned my MBBS at Nigeria's foremost and most prestigious institution of higher learning, which doubles as the highest ranked medical college in Sub-Saharan Africa, the College of Medicine of the University of Ibadan in Nigeria. I completed a Post-Graduate Diploma in Surgical Sciences at the University of Edinburgh, Scotland. I am a Fellow of the West African College of Surgeons (FWACS) in cardiothoracic surgery.

I received advanced training in cardiac surgery at Narayana Health Institute of Cardiac Sciences in Bangalore, India, working and training under esteemed, renowned and reputable cardiac surgeons like Dr. Devi Shetty (complex root and ascending aorta operations and pulmonary endarterectomy) and Dr. P.V. Rao (complex valve repair and LV Aneurysm repair surgeries). I also worked extensively with Dr. Sumit Modi (Director of the Cardiac Program at Mediheal Group of Hospitals).

My special areas of interest are minimally-invasive thoracic surgery especially Uniportal VATS for all ranges of thoracic surgical interventions, heart valve surgery (repair and replacement) and adult congenital heart disease surgeries. I have performed over 1000 procedures.

Dr. Ayodele Lateef
MBBS, AFNMCS,
FWACS (CTh.) PGD (Surg. Sc.)

> **Most of the countries in the African continent have introduced measures aimed at tackling heart diseases. There have been admirable actions showing real impact on patients suffering from heart diseases.**

Global death toll due to heart diseases is a medical fact that is known to all of us and Africa forms a part of it. The number of heart disease deaths is rising in the continent as it is in other parts of the world. Most of these mortality rates can be prevented by addressing the numerous risk factors of unhealthy diet and obesity, tobacco use and alcohol use.

Most of the countries in the African continent have introduced measures aimed at tackling heart diseases. There have been admirable actions showing real impact on patients suffering from heart diseases such as rheumatic heart disease, cardiomyopathy or myocardial infarction. Thanks to the active contribution of the governments and their partnership with private healthcare institutions, which are working for improving the overall health of the average African citizen.

Cardiac Anaesthesia is the most challenging specialty in the field of anaesthesia demanding skills, knowledge, professional & personal competence because of its older, sicker and more fragile patients. Equipped with advanced monitoring and invasive techniques, quality anaesthetic care has major role in the improved outcome after cardiac surgeries.

I have been involved in providing patient care for more than a decade now in the field of transplant anaesthesia including liver transplant, renal transplant and heart transplant. I completed Basic and Advanced Cardiac Life Support Training Course conducted by Apollo Hospital, Delhi in collaboration with American Heart Association. The course is certified by American Heart Association.

I have experience in all anaesthetic procedures like spinal anaesthesia, general anaesthesia, regional blocks, field blocks, and have exposure to pain relieving procedures, CVP lines, posted in critical care wards and trauma centres and have experience in using multichannel monitors and ventilators.

Below is a snapshot of my experience and expertise:

- Experienced & qualified Cardiac Anaesthesiologist.
- Trained at Madras Medical Mission (MMM) Chennai, one of the most reputed and oldest cardiac centres in India.
- Specialized in both adult and paediatric cardiac anaesthesia.
- Trained Liver Transplant Anaesthesiologist.
- Experience in renal and heart transplant anaesthesia.
- Worked at reputed hospitals of India like Medanta Hospital, Bombay Hospital, Choithram Hospital etc.
- Multiple international and national publications and anaesthesia related lectures.
- Recognised and rewarded multiple times for social activities before and during the pandemic.

At Mediheal Group of Hospitals, I form a part of a dedicated team of cardiologists, interventional cardiologists and supporting staff. The team is dedicated to offering the best in cardiovascular care and best clinical outcomes to the population of the African continent.

Dr. Ashwin Soni
PDCC (Cardiac Anaesthesiology and Critical Care Medicine)
MD (Anaesthesiology)

> **I am a super-specialist with DM in Cardiology and MD in Paediatrics with over 8 years of experience. Followed by my sound academic background and research aspiration, I also authored a couple of textbooks on cardiology.**

I am a super-specialist with DM in Cardiology and MD in Paediatrics with over 8 years of experience. Followed by my sound academic background and research aspiration, I also authored a couple of textbooks on cardiology.

I completed my MBBS from Netaji Subhash Chandra Bose Medical College in Jabalpur, Madhya Pradesh, India and went on to obtain my MD (Paediatrics) from Assam Medical College, India.

I am a DM (Cardiology) from MAHER - Meenakshi Academy of Higher Education and Research, Chennai, India. I obtained my Membership of the Royal College of Paediatrics and Child Health (MRCPCH), UK with Foundation of Practice (FOP), Theory and Science (TAS) and Post Graduate Program in Paediatric Nutrition (PGPN) from Boston University, USA.

Dr. Jacob Abraham Ruram
MBBS, MD (Paediatrics)
MRCPCH, PGPN (Boston, USA)
DM (Cardiology)

> **“Mediheal Group of Hospitals has gone a long way in providing the most ultra-modern patient-monitoring facilities for ventilated and non-ventilated ICU, HDU, intra-operative and post-operative patients.”**

In the developed countries, critical care comprises a large proportion of healthcare spending. However, in developing countries, with a greater burden of both illness and critical illness, there is little infrastructure to provide care for these patients. The same was the case in the countries of the African continent. Critical Care in the African countries has been hampered due to poor funding and corruption. However, over the past few years, the scenario has improved with the government’s pro-active approach and willingness to invest more in healthcare.

At Mediheal Group of Hospitals, we are adept at delivering comprehensive care due to the adoption of international standard treatment practices, driven by technology, in a comfortable patient-focused environment. We operate as a team, work closely with clinicians of different departments and support staff, aiming for results par excellence, every single time.

I have over fourteen years’ experience in Critical Care and have attained a firm grasp at clinical skills after working meticulously in intensive care, emergency medicine and advanced trauma life support. My areas of expertise include Sepsis, Vascular Access, Critical Care Toxicology, Intensive Care, Mechanical Ventilation, Difficult Airway Management, Paediatric Anaesthesia and Neuro Anaesthesia.

I am associated with Mediheal Group of Hospitals as a Group Chief Intensivist. I am an MBBS, Doctor of Medicine (MD) in Anaesthesiology and Critical Care. I have an Indian Diploma in Critical Care Medicine (IDCCM) and a Post Graduate Diploma in Disaster Preparedness and Rehabilitation (PGDDPR). I am also ACLS, ATLS, FCCS and MCCRC certificate holder.

Prior to joining Mediheal, I was associated with Yatharth Super-Specialty Hospital, Noida; Max Super-Speciality Hospital, Saket; and Dr. Ram Manohar Lohia Hospital PGIMER, New Delhi, India.

Mediheal Group of Hospitals has gone a long way in providing the most ultra-modern patient-monitoring facilities for ventilated and non-ventilated ICU, HDU, intra-operative and post-operative patients.

We are renowned for bringing quality healthcare services to the region. We are an exception in intensive and critical care. The critical care units at the Mediheal are a combination of many specialities and technologies, offering higher possibilities of survival to patients, who are acutely and critically ill. Our ICUs are designed and managed based on the fact that methodical organisation of critical care services influences overall outcome measures such as mortality, length of stay and infection rates. There are multi-disciplinary ICUs as well as ICUs dedicated to post- cardiac surgery patients, stroke patients, post-transplant patients, as well as special ICUs for neonates and paediatric cases.

Dr. Chanchal Singh
MBBS, MD, IDCCM, PGDDPR

> **Some of the best healthcare organisations like our own Mediheal Group of Hospitals are bringing in newer technologies and advanced treatment services to the region, making sure that the African region stays prepared to tackle any burden facing the region.**

The burden of non-communicable diseases including cardiovascular diseases is rising in the region. Levels of hypertension diagnosis, treatment and control are low and the region has a high share of the world's prevalent rheumatic heart disease cases. The leading causes of heart failure in Sub-Saharan Africa are hypertensive heart disease, cardiomyopathy and rheumatic heart disease, with ischemic heart disease accounting for many cases compared.

Thankfully, the discipline of cardiology is advancing rapidly in Sub-Saharan Africa backed by training and updating of knowledge in close association with other countries. Some of the best healthcare organisations like our own Mediheal Group of Hospitals are bringing in newer technologies and advanced treatment services to the region, making sure that the African region stays prepared to tackle any burden facing the region.

I am a trained cardiac perfusionist with multiple years of experience and expertise in managing heart lung (bypass) machine in operation room during heart surgery. Perfusion is the passage of bodily fluids, such as blood, through the circulatory or lymphatic system to an organ or tissue. Because the heart is mainly responsible for pumping fluid through the body, when a patient has a procedure that interrupts the heart's normal function, a cardiovascular perfusionist steps in to temporarily do the heart's job. I am responsible for operating extracorporeal circulation equipment during an open-heart surgery or any other medical procedure in which it is necessary to artificially support or temporarily replace a patient's circulatory or respiratory function. I also manage IABP and other related equipment during heart surgeries. Apart from perfusion I am assisting to cardiac surgeon as a first assistant and harvesting vein graft for OPCABG.

Deepak Vishwakarma
Clinical Cardiac Perfusionist

OUR EXPERT CARDIAC SCIENCES TEAM

Adopting a collaborative approach, our experienced team of experts provides the finest cardiac care in the region with commitment and care. With a patient-centric approach, they diagnose, treat and rehabilitate cardiac patients with precision as per their unique needs.

CARDIOLOGY AND CARDIOVASCULAR SYSTEM

Cardiology is a medical specialty concerned with disorders of the heart. It deals with the diagnosis and treatment of such conditions as congenital heart defects, coronary artery disease, electrophysiology, heart failure and valvular heart disease. Sub-specialties of the cardiology field include cardiac electrophysiology, echocardiography, interventional cardiology and nuclear cardiology.

The basic functioning of the cardiovascular system includes the way the heart processes oxygen and nutrients in the blood, which is called coronary circulation. The circulation system consists of coronary arteries and coronary veins.

DISORDERS OF THE CARDIOVASCULAR SYSTEM

There are a range of disorders of the cardiovascular system that are treated and studied under the field of cardiology. Among them is acute coronary syndrome, which encompasses the broad range of myocardial infarction symptoms. Angina pectoris, atherosclerosis, coronary heart disease and restenosis are other common disorders.

Broader categories of disorders in the field of cardiology include cardiac arrest; disorders of the myocardium, or the muscle of the heart, which include varieties of cardiomyopathy; disorders of the pericardium, or the outer lining of the heart, which include types of pericarditis; disorders of the heart valves, including the aortic valve, the mitral valve, the pulmonary valve and the tricuspid valve; congenital heart defects, which range from atrial septal defect to ventricular septal defect; diseases of the blood vessels or vascular diseases, which includes aneurysm, deep vein thrombosis, varicose veins, vasculitis and diseases of other blood vessels.

Several devices are used in cardiology, including various types of balloons and defibrillators, a pacemaker and a stethoscope. Artificial hearts also are used and studied in the field of cardiology.

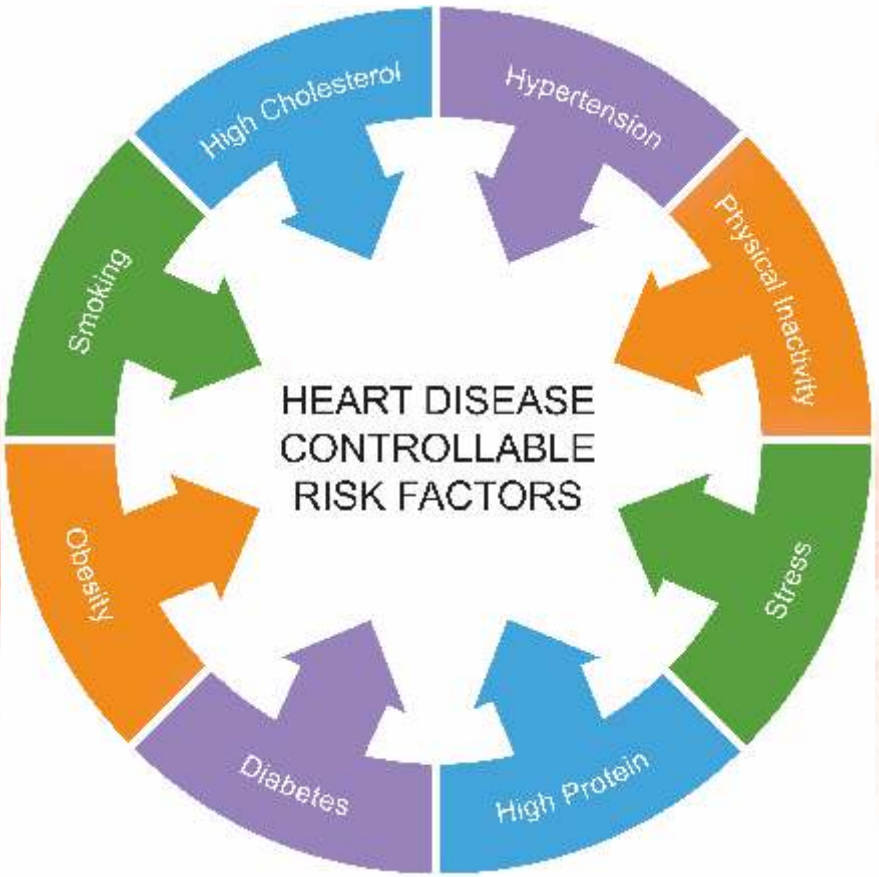
WHAT ARE SOME FACTORS THAT PUT YOU AT RISK FOR CARDIAC PROBLEMS?

There are a variety of factors that can put you at risk for cardiac problems, some of which can be changed.

These risk factors include:

- Smoking tobacco
- High cholesterol
- High blood pressure
- Physical inactivity
- Excess body fat
- Diabetes

The presence of more than one of these factors greatly increases your risk for cardiac problems. Additionally, stress, alcohol consumption and diet are other controllable factors that can raise your chances of experiencing heart-related issues.



WHEN WOULD YOU NEED A CARDIOLOGIST?

If a person has symptoms of a heart condition, their physician may refer them to a cardiologist.

Symptoms that can indicate a heart problem include:

- Shortness of breath
- Dizziness
- Chest pains
- Changes in heart rate or rhythm
- High blood pressure

A cardiologist can carry out tests for a heart murmur or an abnormal heart rhythm. They often treat patients, who have had a heart attack, heart failure, or other heart problems. They help make decisions about heart surgery, heart catheterization, angioplasty and stenting.

The cardiologist can give advice about preventing heart disease. A person may need to see a cardiologist even without symptoms, if they have a family history of heart disease or high cholesterol, if they are or have been a smoker, if they have diabetes or if they are starting a new exercise program.

The most common of the cardiovascular diseases is coronary artery disease (CAD), also known as coronary heart disease (CHD) or ischemic heart disease (IHD). Coronary heart disease develops when the coronary arteries, which are blood vessels that supply oxygen and blood to the heart, become narrow thereby decreasing blood flow to the heart. The reduced blood flow may cause several signs and symptoms.

Symptoms of coronary heart disease include:

- Chest pain
- Palpitations (irregular or faster heart beats)
- Weakness or dizziness
- Shortness of breath
- Nausea
- Sweating

There are multiple factors that can increase a person's risk of developing CHD, including:

- High blood pressure or hypertension
- High levels of low-density lipoprotein, or 'bad' cholesterol
- Low levels of high-density lipoprotein, or 'good' cholesterol
- Diabetes, obesity and smoking

A complete blockage of arteries can be the cause of a heart attack. People can take measures to reduce their risk of CHD by doing regular exercise, adopting a healthy diet and avoiding or quitting tobacco.

WHAT IS A CARDIAC EVALUATION?

A cardiac evaluation refers to the preliminary evaluation of a cardiac patient performed by a cardiologist. This initial evaluation primarily comprises a physical examination and attempts at understanding the medical history of the patient in question.

During the physical examination, trained clinicians look for an underlying cause for symptoms that have presented – such as chest pain or shortness of breath. The symptoms are then assessed to acquire an understanding of the heart function.

The questions on medical history include queries about past or present heart problems or symptoms, family history of heart problems, use of medicines and related medical conditions. The investigation may also include laboratory tests, such as urinalysis or blood tests, in order to identify various other existing or past conditions.

Who needs a cardiac evaluation?

People with risk factors such as old age, tobacco use, high cholesterol, high blood pressure, being physically inactive, being above your ideal weight, a diagnosis of diabetes, being under stress, drinking too much alcohol and having a poor diet are in need of cardiac evaluation.

Cardiac evaluation at Mediheal Group of Hospitals

Over the past decade there has been a dramatic, rapid development of new imaging modalities used in the evaluation of the cardiac patient. These newer techniques are frequently complex and specialised in their application and interpretation.

At Mediheal Group of Hospitals, we take a whole-body approach to your health with special attention for those conditions that you're at high risk for. We offer a variety of testing opportunities to ensure that all your needs are covered.

If you do end up having heart disease, then there are a number of solutions we can consider. For some patients it's as simple as making some lifestyle changes, others need medication, and still others may require more serious treatment.

TMT

2D ECHO

SYMPTOMS OF HEART ATTACK

- Rapid or irregular heartbeats
- Radiating pain
- Discomfort radiating to the back, jaw, throat or arm
- Discomfort, heaviness, pressure or pain in the chest, arm or below the breastbone
- Extreme weakness, anxiety or shortness of breath
- Fullness, indigestion or choking feeling (may feel like heartburn)
- Sweating, nausea, vomiting or dizziness

DIAGNOSIS OF CHD

- Electrocardiogram (ECG)
- Holter monitor
- Echocardiogram (Echo)
- Coronary catheterization
- Stress test
- Nuclear ventriculography
- CT scans
- Blood tests

OUR INVASIVE CARDIOLOGY SERVICES INCLUDE:

Coronary Artery Disease Procedures

- Coronary Angiography
- Coronary Angioplasty
- Complex Angioplasty

Coronary Angiography (CAG):

A coronary angiogram is a procedure that uses X-ray imaging to see your heart's blood vessels. The test is generally done to see if there's a restriction in blood flow going to the heart.

During a coronary angiogram, a type of dye that's visible by an X-ray machine is injected into the blood vessels of your heart. The X-ray machine rapidly takes a series of images (angiograms), offering a look at your blood vessels. If necessary, your doctor can open clogged heart arteries (angioplasty) during your coronary angiogram.

Coronary Angioplasty (PTCA):

A coronary angioplasty is a procedure used to widen blocked or narrowed coronary arteries.

The term "angioplasty" means using a balloon to stretch open a narrowed or blocked artery. However, most modern angioplasty procedures also involve inserting a short wire-mesh tube, called a stent, into the artery during the procedure. The stent is left in place permanently to allow blood to flow more freely.

Complex Angioplasty:

- Bifurcation Angioplasty
- Intravascular Ultrasound / OCT Guided PCI
- Rotational Atherectomy Angioplasty / Intravascular lithotripsy (IVL)
- FFR Angioplasty

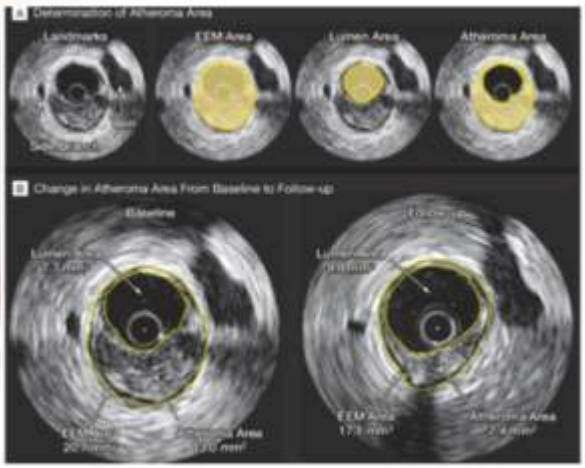
Normal coronary arteries on left side of the heart

Normal coronary arteries on the right side

Advanced world-class state-of-the-art Cathlab

Bifurcation Angioplasty

It is often useful to think of the heart arteries like a tree with branches. At the site where a side-branch vessel comes off of the main coronary artery, plaque and fatty build-up are more likely to develop because of forces related to changes in blood flow. Stenoses, or narrowing, located in a main coronary artery and an adjoining side-branch vessel is called a bifurcation blockage or bifurcation lesion. Bifurcation interventions are challenging and we are experts in all kind of bifurcation stenting including SKS, Cullot, minicrash.



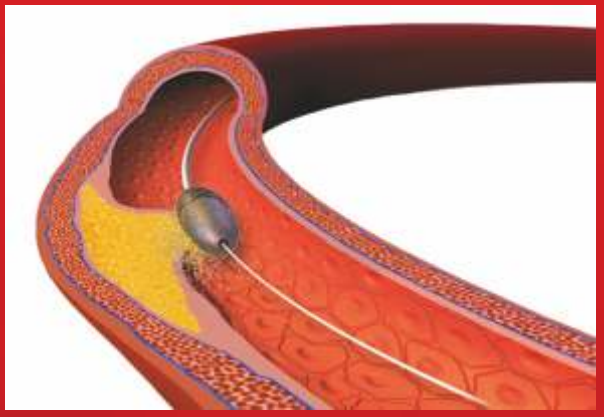
Intravascular Ultrasound / OCT Guided PCI

Intravascular Ultrasound (IVUS)/OCT optical coherence tomography is a catheter-based diagnostic procedure used to view the inside of a coronary artery, providing a real-time view. IVUS shows the degree of narrowing or thickening (stenosis) of an artery by providing a visual image of the inside of the artery (the lumen) and the atheroma (membrane/cholesterol loaded white blood cells) that are hidden within the artery wall. Physicians typically use IVUS to image the lining of an artery in preparation for, during or to review the results of an angioplasty or atherectomy. It is also used in the placement of stents.

Rotational Atherectomy Angioplasty/Intravascular Lithotripsy (IVL)

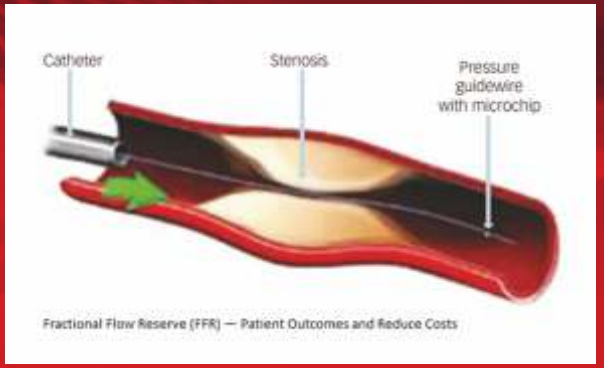
Both these techniques are useful to treat hard calcific coronary blockage and demands high skill sets. In a rotational atherectomy, interventional cardiologists use a revolving instrument to break up calcified plaque that is clogging a coronary artery. Breaking up the plaque restores blood flow to the heart.

Cardiologist may also combine rotational atherectomies with stent placement.



FFR Angioplasty

Fractional Flow Reserve (FFR) is a technique used in coronary catheterization to measure pressure differences across a coronary artery stenosis (narrowing, usually due to atherosclerosis) to determine the likelihood that the stenosis impedes oxygen delivery to the heart muscle. In other words, FFR expresses the maximal flow down a vessel in the presence of a stenosis compared to the maximal flow in the hypothetical absence of the stenosis. It is a tool to determine severity of lesion, where further intervention is required or not.



Structural Heart Interventions:

Congenital Heart Disease Interventions

- ASD/VSD/PDA device closure
- Vascular closure for aneurysms and malformations

What is a closure device?

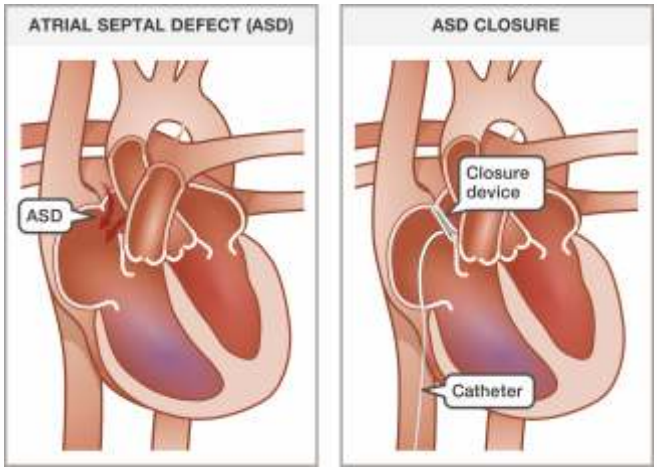
Closure devices are used to close a defect or an opening between the right and left sides of the heart. Some of these birth defects are located in the wall (septum) between the upper chambers (atria) of the heart: Patent Foramen Ovale (PFO), Atrial Septal Defect (ASD). Some are located in the wall of lower chamber (ventricles) of heart: VSD closure

Valvular interventions

- Balloon Mitral Valvuloplasty (BMV)
- Percutaneous Aortic Valve Replacement (TAVI), Mitra clip

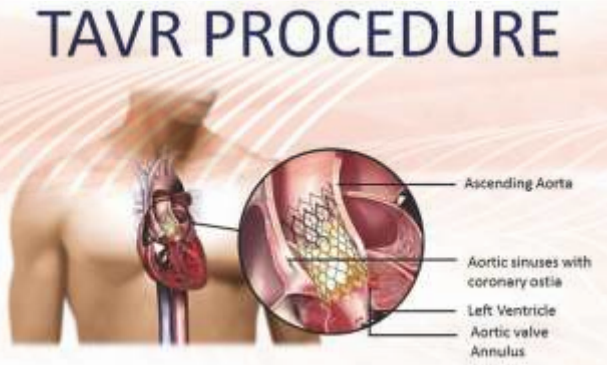
Balloon Mitral Valvuloplasty

A balloon valvotomy is a treatment for mitral valve stenosis. It is a procedure that widens the mitral valve so that blood flows more easily through the heart. A balloon valvotomy is a minimally invasive procedure.



Transcatheter Aortic Valve Implantation

Transcatheter aortic valve implantation (TAVI) is a procedure that allows an aortic valve to be implanted using a long narrow tube called a catheter. Usually, the catheter is inserted into a large blood vessel in your groin. This is procedure, which is non-surgical method to place valve in a diseased valve.



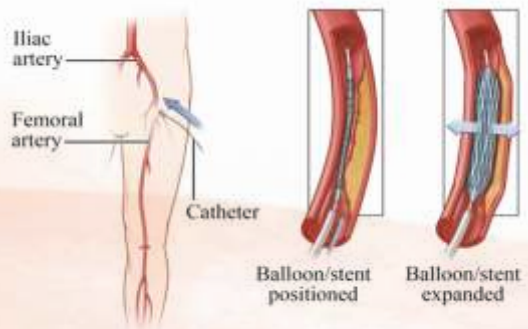
Peripheral Interventions:

Peripheral Angiography

Aortography, upper limb & lower limb angiography, renal angiography, cerebral angiography

Peripheral Angioplasty

- Sub-clavian angioplasty
- Renal angioplasty
- Carotid angioplasty
- Peripheral angioplasty limb vessels



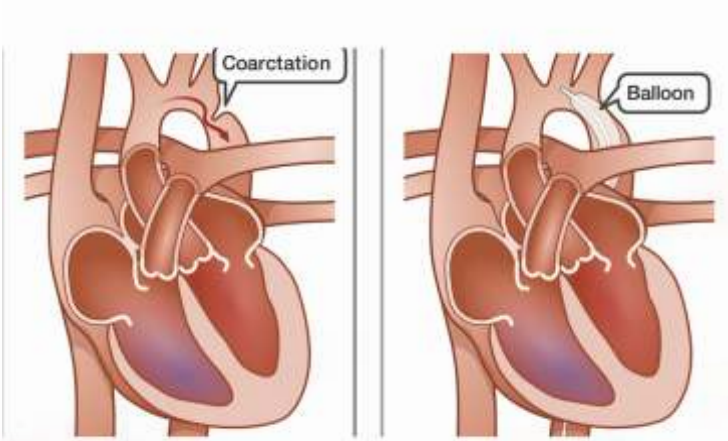
Aortic Interventions

- Aortic Stent Graft
- Coarctation Stenting

DVT & Pulmonary Embolism Interventions

Coarctation Angioplasty

The aorta is the large blood vessel that carries blood from the heart to the rest of the body. A coarctation of the aorta is a narrowing of this blood vessel. A coarctation of the aorta means that less blood can flow to the lower part of the body. It can also cause high blood pressure in the arms. Coarctation stenting and balloon angioplasty are ways to treat coarctation.



Carotid Angiography & Angioplasty

Contrast dye is injected through the catheter so that X-ray movies of your carotid arteries (the arteries that supply your brain with oxygen-rich blood) are taken. This procedure is considered the "gold standard" for imaging the carotid and cerebral vessels. It is performed best by a heart specialist. Removal of carotid clot can be possible by carotid angioplasty.

Renal Angiography & Angioplasty

The kidneys filter wastes from the blood and make urine. When the blood vessels that supply the kidneys with blood narrow, it's called renal artery stenosis. The narrowing lowers the amount of blood flowing to one or both kidneys. Problems in both can lead to kidney failure and resistant hypertension.

Renal angiography is the study of the blood vessels to the kidneys. Renal angioplasty can prevent renal failure and treat secondary hypertension.

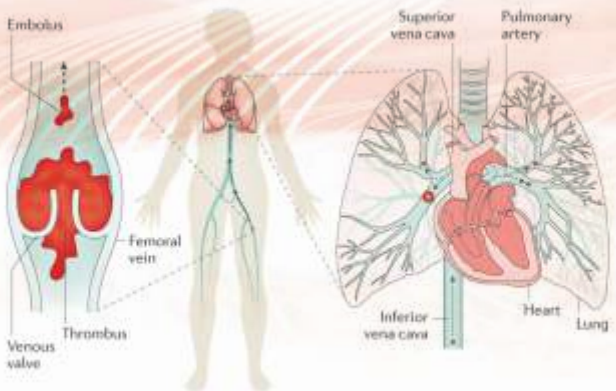
Deep Vein Thrombosis and Pulmonary Embolism Interventions:

Deep Vein Thrombosis (DVT) is a serious condition that occurs when a blood clot forms in a vein located deep inside your body. Deep vein blood clots typically form in your thigh or lower leg, but they can also develop in other areas of your body. Other names associated with this condition may include thromboembolism, post-thrombotic syndrome and postphlebitic syndrome.

A pulmonary embolism is a blood clot that occurs in the lungs. It can damage part of the lung due to restricted blood flow, decrease oxygen levels in the blood and affect other organs as well. Large or multiple blood clots can be fatal.

Interventions for DVT & Pulmonary Embolism:

- Catheter directed thrombolysis
- IVC filter placement



Catheter-directed Thrombolysis

Catheter-directed thrombolysis treats vascular blockages and improves blood flow by dissolving abnormal blood clots. A blood clot or thrombus can block off blood supply to certain parts of the body and cause serious damage. Catheter-directed thrombolysis uses X-ray imaging and a catheter to guide special medication or a medical device to the site of a blood clot to dissolve the blockage.

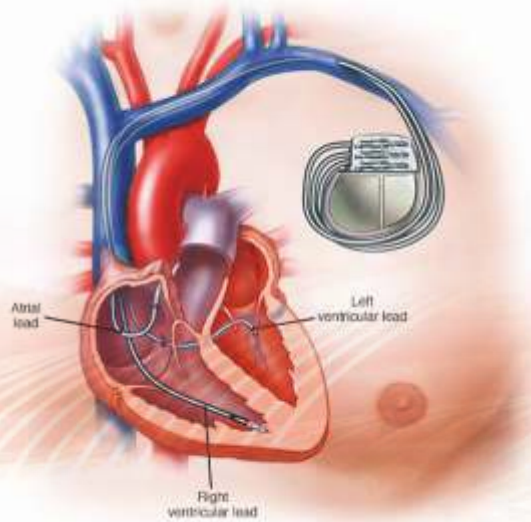
Pacemaker:

A pacemaker is a device that sends small electrical impulses to the heart muscle to maintain a suitable heart rate or to stimulate the lower chambers of the heart (ventricles). A pacemaker may also be used to treat fainting spells (syncope), congestive heart failure and hypertrophic cardiomyopathy. This is an image of one of high-end procedures in cardiology called as CRT cardiac resynchronisation therapy.

Electrophysiological or conduction abnormality procedures:

- Single and double chamber pacemaker
- Single and double chamber defibrillator (AICD)
- CRT (Cardiac resynchronization therapy)
- Implantable cardiac monitors
- Leadless pacemaker

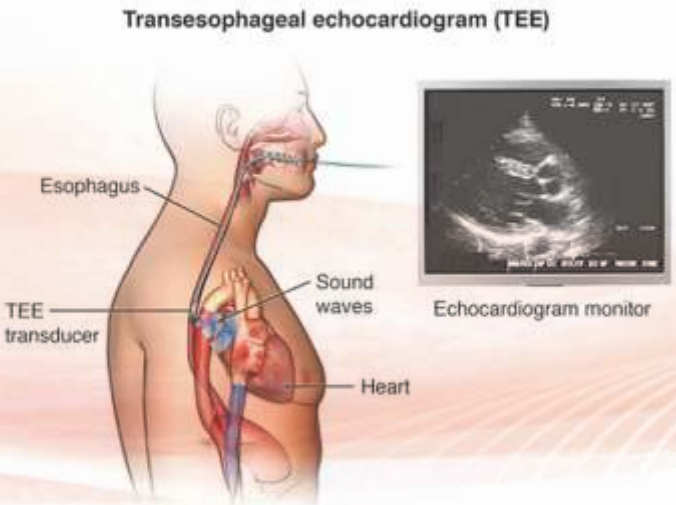
Aortography, upper limb & lower limb angiography, renal angiography, cerebral angiography



INTERVENTIONAL CARDIOLOGY TEAM

OUR NON-INVASIVE SERVICES INCLUDE:

- **2D Echocardiography**
- **Transoesophageal echocardiography**
- **Dobutamine stress echocardiography**
- **Holter monitoring**
- **Ambulatory BP monitoring**
- **TMT- Trade mill test (stress exercise test)**



2D Echocardiography:

2D Echocardiography is a test in which ultrasound technique is used to take pictures of the heart. It displays a cross sectional 'slice' of the beating heart, showing chambers, valves and the major blood vessels of heart

TEE Transoesophageal Echo:

Transoesophageal Echocardiography (TEE) is a test that produces pictures of your heart. TEE uses high-frequency sound waves (ultrasound) to make detailed pictures of your heart and the arteries that lead to and from it. Unlike a standard echocardiogram, the echo transducer that produces the sound waves for TEE is attached to a thin tube that passes through your mouth, down your throat and into your oesophagus. Because the oesophagus is so close to the upper chambers of the heart, very clear images of those heart structures and valves can be obtained.

Dobutamine Stress Echo:

A dobutamine stress echocardiogram is another form of stress echocardiogram. However, instead of exercising to stress the heart, the stress is obtained by giving a drug that stimulates the heart and makes it "think" it is exercising.

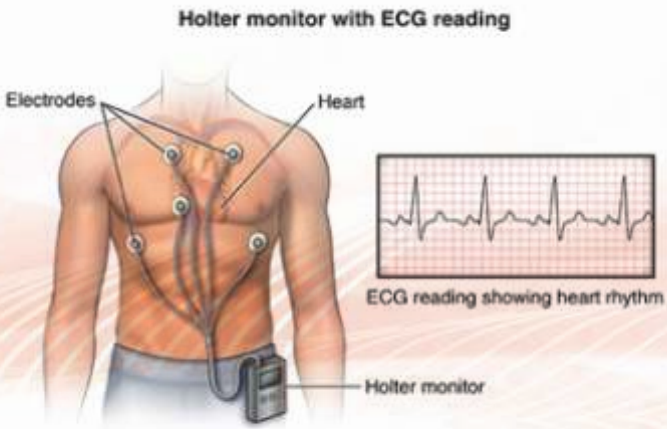
A dobutamine stress echocardiogram compares the performance of your heart at rest to that of your heart during exercise. The test performed at the heart clinic involves an echocardiogram (ultrasound), an electrocardiogram (EKG) and the use of a medication called dobutamine.

Holter Monitoring:

A Holter monitor is a battery-operated portable device that measures and records your heart's activity (ECG) continuously for 24 to 48 hours or longer depending on the type of monitoring used. The device is the size of a small camera. It has wires with silver dollar-sized electrodes that attach to your skin. The Holter monitor and other devices that record your ECG as you go about your daily activities are called an ambulatory electrocardiogram.

Ambulatory BP Monitoring:

Ambulatory Blood Pressure Monitoring (ABPM) is a relatively new technique for assessing a person's blood pressure. Ambulatory blood pressure monitoring measures blood pressure at regular intervals. ABPM allows a doctor to assess your blood pressure during your routine daily living, instead of when you are sitting nervously on the doctor's examination table.



World class ultramodern Cardiac Theatre with laminar air flow

OUR CARDIOVASCULAR SURGICAL SERVICES INCLUDE:

CARDIAC SURGERY

Our cardiac surgery experts deal with advanced and chronic heart conditions and use the best surgical intervention techniques to provide treatment to patients. Cardiac surgery includes coronary artery bypass grafting and correction of congenital heart diseases. Part of the surgical procedures also includes the repair and replacement of valves in valvular heart disease arising due to numerous causes including rheumatic heart disease, ischaemia and endocarditis.

CORONARY ARTERY BYPASS GRAFTING (CABG)

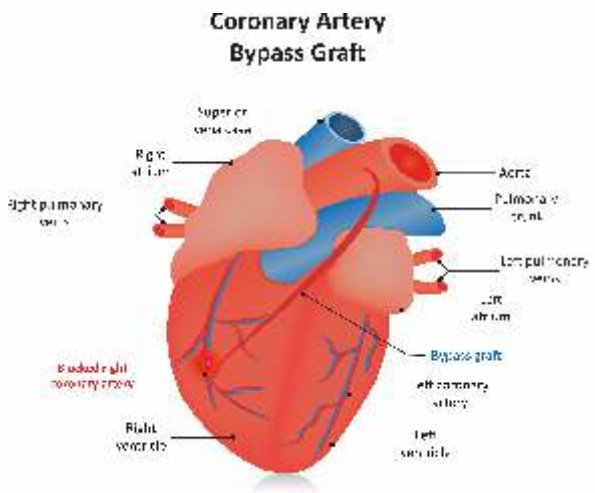
When normal blood flow to the heart is partially obstructed due to coronary artery arteriosclerosis, bypass surgery is often the best solution. CABG treats blocked heart arteries by creating new passages for blood to flow to the heart muscle. Other arteries or veins from the patient's body are used to create grafts that reroute the blood around the clogged artery. A patient may undergo one, two, three or more bypass grafts, depending on how many coronary arteries are blocked. CABG is one of the most standard and effective procedures to improve the supply of blood and oxygen to the heart, relieve chest pain, reduce risk of heart attack and improve the patient's ability to engage in physical activity. This is performed both as using traditional techniques requiring heart-lung machine support as well as minimally invasive procedure.

CABG using conventional heart-lung machine

Traditionally, coronary artery bypass surgery is performed with the assistance of a heart – lung machine, which allows the heart to be stopped, so that the surgeon can operate on a surface, which is blood-free and still. The heart-lung machine maintains circulation despite the lack of a heartbeat, removing carbon dioxide from the blood and replacing it with oxygen before pumping it around the body.

CABG beating heart technique

In this technique of performing CABG, the heart-lung machine is not used. Here, instead of stopping the heart, the area where the anastomosis is performed is stabilized with advanced instruments, while the rest of the heart beats normally, pumps blood and circulates blood to the entire body.



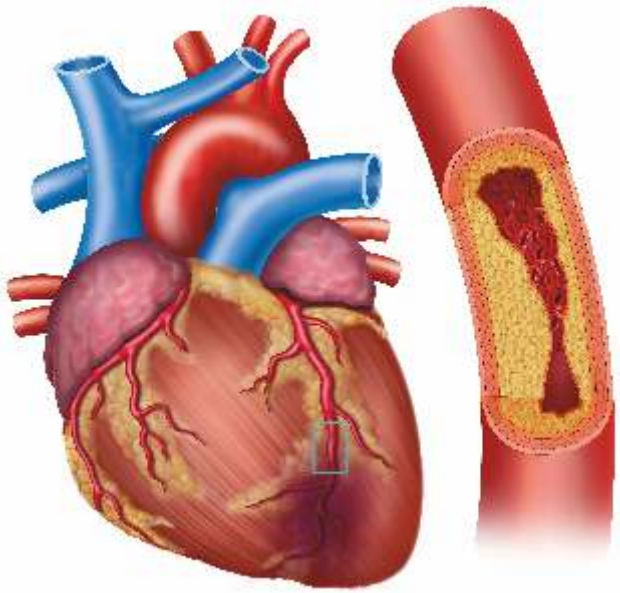
Total arterial revascularization: LIMA-RIMA-Y Technique

In this technique right internal mammary artery (RIMA) is attached to the left internal mammary artery (LIMA) in an inverted Y configuration.

Studies show that total arterial revascularization provides better long term survival than a single arterial graft. Survival is improved when a right internal mammary artery (RIMA) is used than radial artery as a second conduit, when performing CABG for multi-vessel disease. Nearly 50% of CABGs are total arterial using both internal mammary arteries

Left internal mammary artery (LIMA)

Over the last two decades, many studies have shown better long-term outcomes and survival in patients undergoing CABG with LIMA to the left anterior descending artery. Worldwide, LIMA is considered the gold standard for surgical revascularisation and its usage has been steadily increasing.



Right Internal Mammary Artery (RIMA)

Survival is improved when the right internal mammary artery (RIMA) rather than the radial artery is used as the second conduit when performing CABG for multi-vessel disease. Studies show that total arterial revascularization provides better long-term survival than a single arterial graft.

Y Technique:

In this approach, both left internal mammary artery (LIMA) and right internal mammary artery (RIMA) are joined with each other in an inverted Y configuration. Then multiple bypasses are done with LIMA and RIMA.

Minimally invasive CABG

Minimally invasive coronary artery bypass (MIDCAB) is an option for some patients, who require CABG. The benefits of minimally invasive surgery include a smaller incision (3 to 4 inches instead of the 6- to 8-inch incision with traditional surgery) and smaller scars. Other possible benefits include a reduced risk of infection, less bleeding, less pain and trauma, decreased length of stay in the hospital and decreased recovery time.

CABG with associated procedures

A variety of surgical procedures are combined with CABG like valve repairs and replacements, correction of structural defects of the heart, ventricular aneurysms, carotid artery bypass etc. These procedures are combined, when an individualized patient treatment plan is developed.

Redo CABG

Repeat cardiac operations are technically more demanding due to higher risk profile of the patients. This is usually performed in patients, who had previous surgery and present with symptoms, which are not relieved by other modalities of treatments.

Heart Valve Surgery

Valvular heart disease occurs, when one of the heart's four valves (mitral, aortic, tricuspid or pulmonary) is not working properly. The cardiac surgeons at Mediheal Hospital repair and replace all four types of heart valves and also perform redo valve surgery.

Valve surgery can be broadly divided into 1) repair surgery and 2) replacement surgery. The clinical evaluation and various tests determine the best type of procedure for you. Other factors influencing the decision are the structure of your heart, your age, other medical conditions you have and your lifestyle. Valve surgery may be combined with other heart surgeries also. Mediheal Hospital offers all types of valve surgeries, whether it is repair or replacement.

Hybrid CABG

This is an alternative to traditional bypass surgery usually performed in patients, who are at a high risk for conventional CABG. In this procedure, coronary artery bypass grafting and stenting are performed at the same time. In high risk patients, hybrid CABG has resulted in less pain and quicker recovery time. The most important requirement for performing this procedure is a highly sophisticated operating room called 'HYBRID LAB'. Mediheal is the only hospital in the east Africa to have a hybrid lab.

Mitral Stenosis

Mitral valve between left atrium and left ventricle is most common valve, which is affected by infection - rheumatic fever. It will lead to mitral stenosis - narrowing of the valve. It will lead to pulmonary congestion - irregular heart rhythm. The valve can be opened by specially designed balloons in the cathlab. If it is not possible to open by balloon catheter then surgery is required to replace the valve.

Mitral Regurgitation

When the mitral valve – which guards the left atrium (LA) / left ventricle (LV) blood flow – does not close tightly, it can leak blood back into the left atrium and cause extra load on the heart. For severe leak, the valve has to either be repaired or replaced. Our surgical team has vast expertise in repairing the mitral valve, which can allow the patient to avoid artificial replacement of the valve and the permanent need for blood thinners.

Aortic Valve stenosis

The valve abnormality is similar to pulmonary stenosis, but is on the left side. This is more dangerous as the blood vessel carries blood to the whole body. The valve can be opened by specially designed balloons in the cathlab. The patient has to be on regular follow up and may require surgery (valve repair/replacement) in the long run.

Aortic Regurgitation

Here the blood leaks back from the aorta to the left ventricle, causing the left ventricle to dilate and if not treated leads to left ventricular failure. This could be caused by various conditions, such as bicuspid aortic valve, marfan syndrome and rheumatic heart disease. The treatment is to repair or replace the valve. Our surgical team has expertise in diseases of the aortic valve

Double valve replacement

In this surgery both valves (mitral and aortic) of left heart are replaced with artificial valve. The valve replacement helps to prevent further damage to the heart or a heart infection.

Tricuspid Valve repair

Tricuspid valve is situated on right side of heart and leakage of this valve is associated with mitral valve disease. It can be treated with tricuspid valve repair/replacement.

Homograft valve replacement

A homograft is donated from a cadaver to be used during complex reconstructive surgery. It typically includes human heart valves and arteries.

ROSS procedure

This is a complex surgery that can be very effective for treating a damaged aortic valve especially in younger patients. Here, the patient's damaged aortic valve is replaced with his own pulmonary valve and a treated valve from a cadaver is used in the place of the pulmonary valve. Generally this is an effective procedure for maintaining long term wellness without the need for ongoing medications like blood thinner.

Valve replacement with cardiac ablation

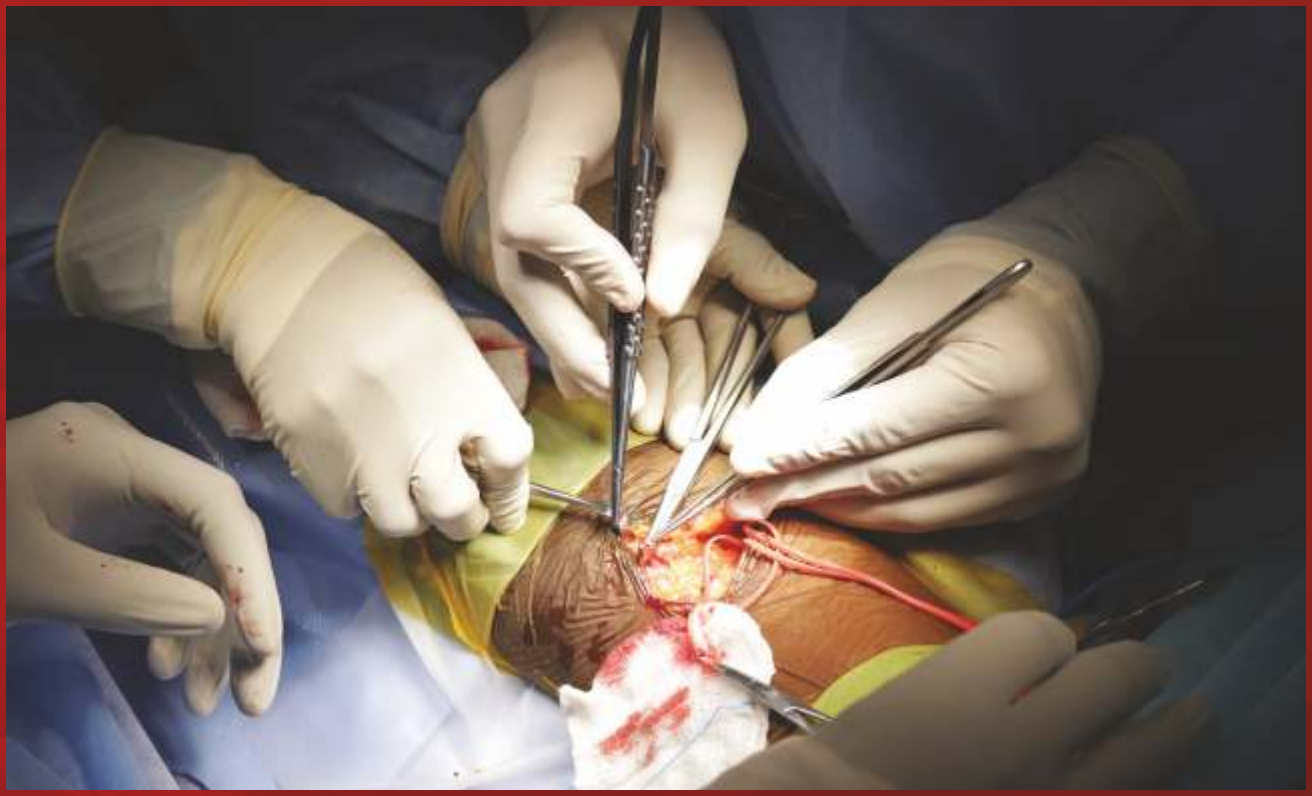
When medication is ineffective or cannot be tolerated by patients with arrhythmias (usually atrial fibrillation), a non-surgical procedure called catheter ablation may be performed. This procedure is frequently performed with a CABG or valve replacement. The surgeon can use small incisions, radio waves, freezing, microwave energy or ultrasound energy to create scar tissue. The scar tissue, which does not conduct electrical activity, blocks the abnormal electrical signals causing the arrhythmia.

Surgery for infective endocarditis

Infective endocarditis of valves is caused most often due to bacterial infection. It can affect the native valves or prosthetic valves. Many a time the treatment requires replacement of the affected valve. The surgery for infective endocarditis is very complex and technically demanding. This may require use of homograft to reduce the chance of further infection. Mediheal offers surgical treatment for infective endocarditis

Redo valve surgery

When initial valve surgery fails, redo valve surgery may be medically warranted to improve and / or save the life of the patient. These surgeries are technically advanced and clinically complicated, therefore they are only performed on chronically ill heart patients.



Aortic Surgery

We have a specialized team highly experienced in treating all types of aortic diseases like aneurysms, dissections, trauma etc. We use advanced treatment options like Endovascular Aneurysm Repair (EVAR), debranching of the aortic arch and renovisceral debranching for treating these conditions. The very advanced hybrid lab helps in doing these procedures in single stage instead of multiple sittings

Aortic root replacement (Bentall's Procedure)

This specialized complex cardiac surgery involves replacement of damaged aortic valve, aortic root and ascending aorta along with re-implantation of coronary arteries into the graft.

Valve sparing aortic root replacement

In this procedure, the patient's aortic valve is kept intact, although it may be repaired, reimplanted and reconnected to a new section of aortic tissue. By preserving the natural aortic valve, patients avoid the need for lifelong anticoagulation therapy, such as the medication warfarin.

Surgical repair of all types of aneurysm emergency surgery for aortic dissection

The aorta is the main artery that carries blood away from the heart to the rest of the body. When an aortic dissection occurs, the blood being pumped forcefully through the aorta splits the layers of the artery wall, allowing a build-up of blood to continually leak into the space. This further splits the artery wall, trapping the blood that is coming from the heart. This is a medical emergency that requires a rapid response and surgical intervention to repair the aorta.

Surgery for aortoarteritis (Takayasu's disease)

This is a chronic inflammatory disease involving the aorta, the arteries arising from the aorta and often the pulmonary arteries. The inflammation leads to stenosis, occlusion of the involved artery and / or aneurysm formation. There are various types of this disease, but all are serious and can have life-threatening consequences, if not appropriately diagnosed and treated. Treatment is a three-step process, as follows. First, the immune reaction that has caused the damage is suppressed with corticosteroids such as prednisone. Second, infections are brought under control using antibiotics. Finally, surgery may be performed to repair the aorta and any other organs that may have been damaged.

Arrythmia surgery for atrial fibrillation pulmonary vein isolation

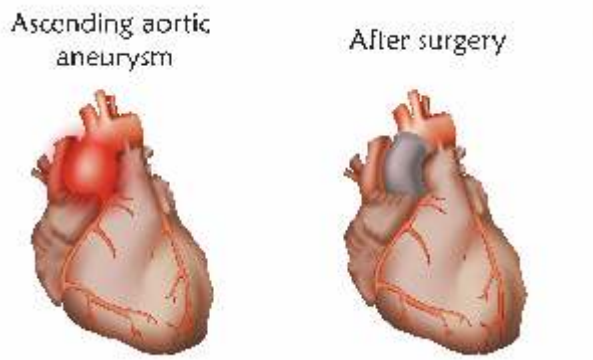
In this procedure all 4 pulmonary veins are isolated from left atrium by crating surgical scar. The scar tissue, which does not conduct electrical activity, blocks the abnormal electrical signals causing the arrhythmia.

MAZE procedure

When medication is ineffective or cannot be tolerated by patients with arrhythmias (usually atrial fibrillation), a non-surgical procedure called catheter ablation may be performed. This procedure is frequently performed with a CABG or valve replacement. The surgeon can use small incisions, radio waves, freezing, microwave energy or ultrasound energy to create scar tissue. The scar tissue, which does not conduct electrical activity, blocks the abnormal electrical signals causing arrhythmia.

Surgery for ventricular aneurysm

Ventricular aneurysm is a complication of heart attack, which develops after a few days or weeks. Here, a portion of the heart musculature thins out and bulges, leading to heart failure and arrhythmias. Surgical remodelling of the left ventricle can be combined with revascularization.



CARDIAC ICU

EXPERT CARDIAC SURGERY TEAM

PAEDIATRIC CARDIAC PROCEDURES - CONGENITAL HEART DISEASE

Congenital Heart Defects (CHDs) are the most common type of birth defects, accounting for nearly one-third of all major congenital anomalies. In an article published in the November 2011 issue of the Journal of the American College of Cardiology, the authors cited a worldwide study population of 24,091,867 live births, with CHD identified in 164,396 individuals.

A defect results, when the heart or blood vessels near the heart do not develop normally in utero. There are many types of congenital heart defects, but the most common one occurs, when the muscular wall (septum) separating the bottom chambers of the heart (right and left ventricles) doesn't fully form – in lay terms this is referred to as a hole in the heart.

The smallest patients require the most compassionate care. Our team of interventional paediatric cardiologists and cardiac surgeons are supported by physicians, intensivists, nurses and anaesthesiologists. Together they provide children with the most effective, highest quality of cardiovascular care in the world and types of heart surgeries. We can determine if heart murmurs, chest pain, dizzy spells, palpitations or other symptoms indicate a potential congenital or acquired heart problem. Whenever possible, our surgical team chooses minimally invasive procedures. In the event that a more invasive approach is required, our team uses clinically advanced best practices to reduce risk and prevent infection. We realize this is a highly stressful time for parents. Our clinical team communicates with family members regularly to keep them up-to-date on the status of their child.

Mediheal hospital has facilities for paediatric cardiovascular cathlab interventions and the care of complex cardiac conditions.

A sample of the minimally invasive cathlab procedures we perform include:

- Device closure of the atrial septal defect, ventricular septal defect and PDA
- Balloon valvuloplasties for pulmonary and aortic valve stenosis
- Stenting for coarctation of aorta and pulmonary artery stenosis
- Embolization of collaterals
- Additional complex surgeries

We offer open-heart surgery for congenital heart defects and other complex congenital lesions that cannot be repaired via minimally invasive techniques.

A sampling of the congenital heart defects we treat at Mediheal Hospital include:

Atrial Septal Defect (ASD)

This is a hole in the wall (septum) that separates the two upper chambers (Atria) of the heart. This defect allows oxygen-rich blood to leak into the oxygen-poor blood chambers in the heart. A small hole may close on its own, but a larger one usually requires surgery.

Ventricular septal defect (VSD)

This is a hole in the wall (septum) separating the two lower chambers (Ventricles) of the heart. The oxygen-rich blood then gets pumped back to the lungs instead of out to the body, causing the heart to pump harder. A small hole may close on its own, but a larger one usually requires surgery.

Patent ductus arteriosus closure (PDA)

This is a fairly common congenital heart defect that occurs, when a temporary blood vessel, called the ductus arteriosus, does not close soon after birth. This can cause an enlarged heart and weakened blood flow. In rare cases, PDA goes undetected until adulthood, when the patient experiences symptoms including heart palpitations, shortness of breath and pulmonary hypertension (high blood pressure in the lungs).

Repair of coarctation of aorta

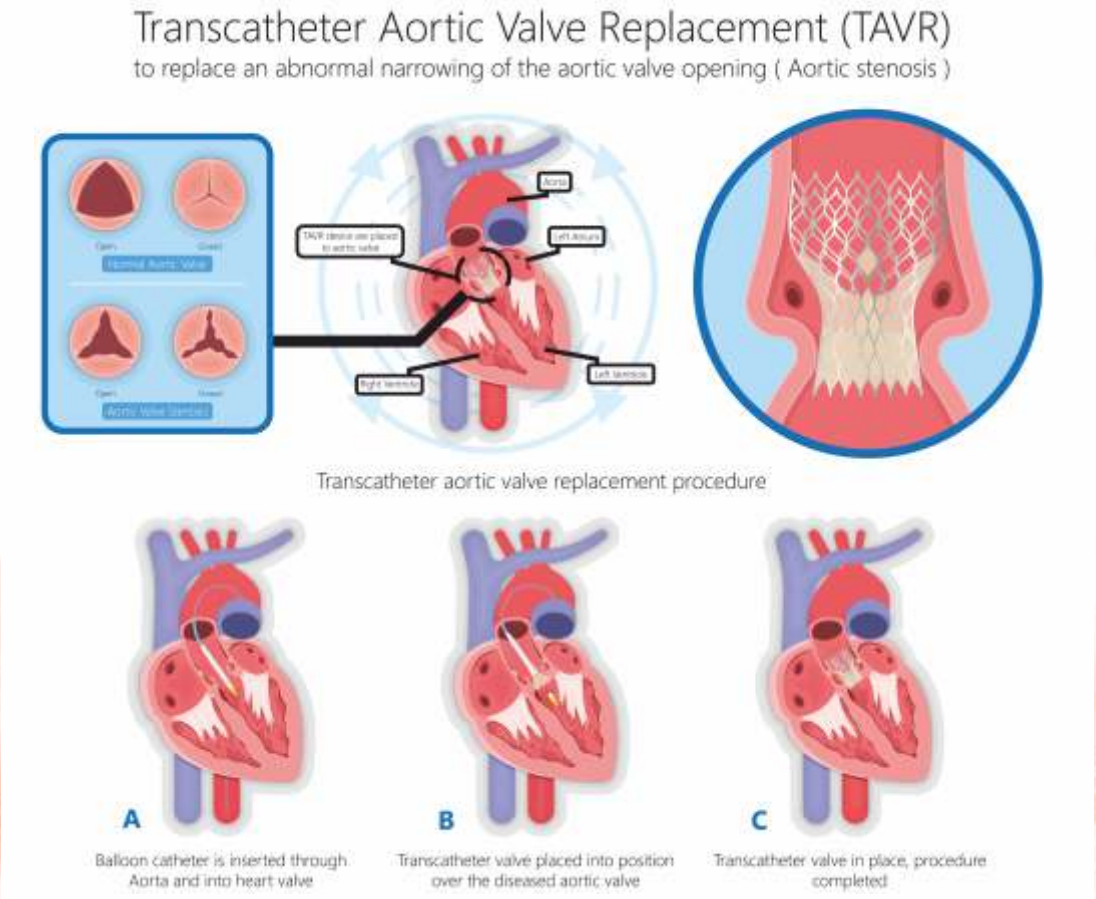
Coarctation of the aorta is a narrowing of the aorta located just beyond the "arch" of the aorta. The blockage can increase blood pressure in the arms and head, while reducing pressure in the legs. At times, the narrowing of the aorta is so severe that there is essentially no connection between the upper and lower portions of the aorta (interrupted aortic arch). Patients may develop coronary artery disease, leaving them vulnerable to heart attacks. Surgery repairs the narrowing in the arch, opening it to restore normal blood flow.

Teteralogy of Fallot (TOF)

TOF is a most common cyanotic congenital heart disease in which there are four defects in the heart and it leads to bluish discoloration of fingers, toes and lips due to inadequate oxygenation in the body.

Total anomalous pulmonary venous connection (TAPVC)

This is a congenital heart defect in the veins leading from the lungs to the heart. The blood does not take the normal route from the lungs to the heart and out to the body. Instead, the veins from the lungs attach to the heart in abnormal positions and causes oxygenated blood to enter or leak into the wrong chamber.



Transposition of the great arteries (TGA)

In this heart defect, which is present at birth, the two main arteries leading out of the heart, the pulmonary artery and the aorta, are switched in position or transposed.

Atrioventricular canal defect (AVCD)

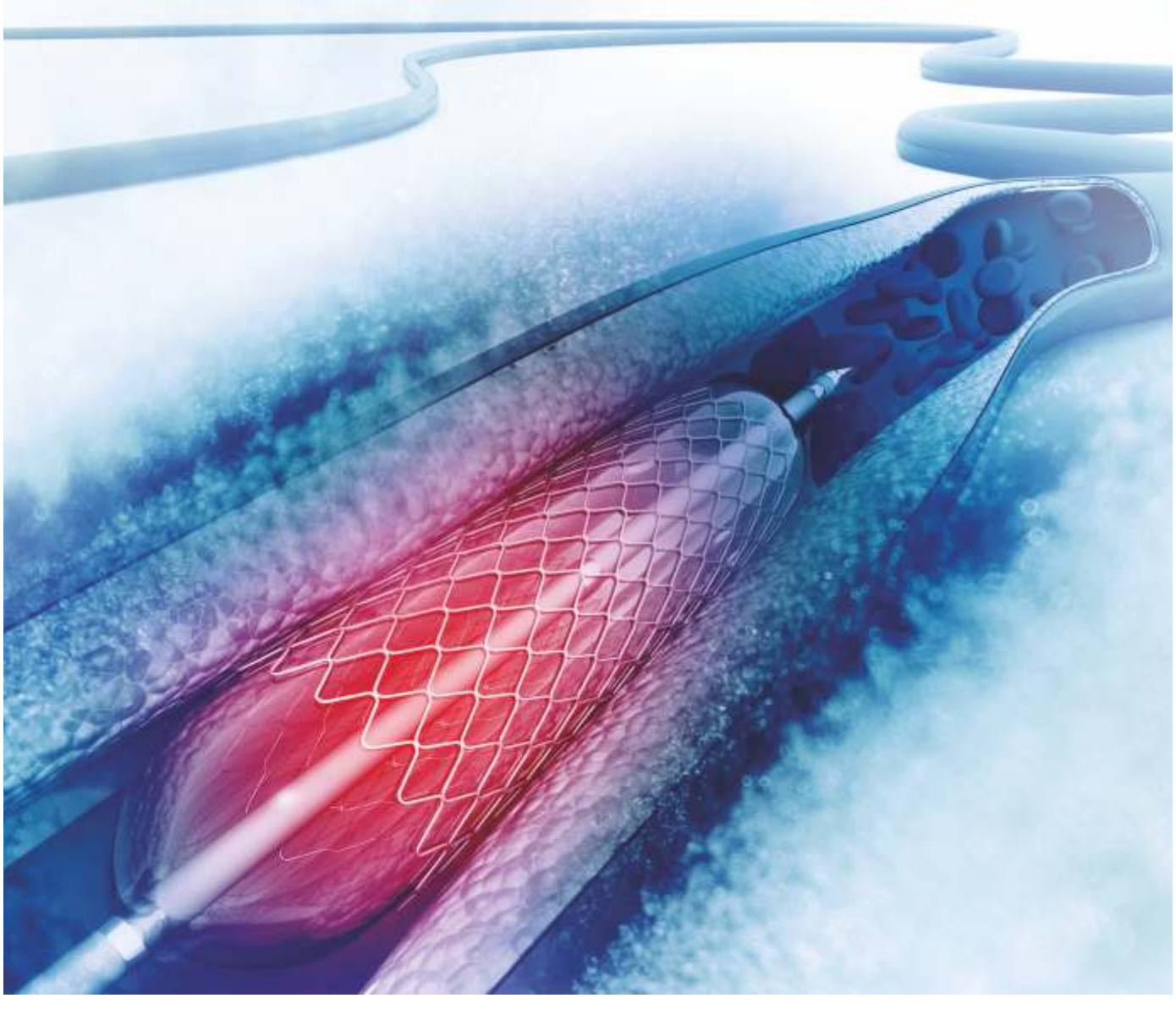
There are two types of atrioventricular canal defects: complete and partial. The complete form is a combination of several closely related heart problems that result in a large defect in the centre of the heart, affecting all four chambers, where they would normally be divided. The defect allows extra blood to flow to the lungs, causing the heart to overwork and the heart muscle to enlarge.

Sinus of valsalva (RSOV)

This is a rare condition, usually congenital, that typically originates in the right or non-coronary aortic sinus. This type of aneurysm may cause asymptomatic murmur, angina, symptoms of valvular insufficiency or outflow obstruction. When rupture occurs, the aneurysm may produce serious instability including acute heart failure or sudden death. If rupture is suspected, immediate diagnosis is pursued with transesophageal echocardiography or cardiac catheterization.

Closures, shunts and other speciality procedures

Adults with congenital heart disease may or may not have been diagnosed as an infant or child. As a result, they can have a wide array of heart disease ranging from small holes in the heart to valve failure. Our cardiovascular surgeons are skilled at using closures, shunts and specialty surgical procedures to address paradoxical embolization, endocarditis, valve deterioration and other conditions that may result from adult congenital heart disease.



VASCULAR SURGERY

Vascular heart surgery focuses on the repair of the blood vessels of the body. It is a surgical sub-specialty for the treatment of several types of aneurysms, debranching of aortic arch, renovisceral debranching, and endovascular aortic aneurysm repair (EVAR).

Repair of abdominal aortic aneurysm, thoracic aortic aneurysm, thoracoabdominal aortic aneurysm

Most aneurysms occur in the aorta, which is the largest artery in the body. An aortic aneurysm is a bulging or ballooning of a weakened part of the aortic artery wall. The normal pressure of blood from the pumping of the heart causes the weakened portion of the aorta to slowly stretch and bulge, leading to the formation of an aneurysm. Aortic aneurysms are dangerous because of the risk that they will rupture, which causes life-threatening internal haemorrhage.

Our cardiovascular surgeons repair aortic aneurysms regardless of where they occur in the body; thoracic aortic aneurysms in the chest cavity, thoracoabdominal aneurysms extending from the chest into the abdomen and abdominal aortic aneurysms in the abdominal portion of the aorta. During surgery, the cardiovascular surgeon repairs or removes an aneurysm through an incision in the skin. The excess blood and plaque are removed and then replaced with artificial grafts.

Debranching of aortic arch

The aortic arch is the portion of the heart's main artery (aorta) from where the branches to brain and both upper limbs originate. Any significant disease of the aortic arch usually needs replacement of the arch and reimplantation of these branches. This is considered to be a very high risk procedure. The debranching approach has dramatically lowered this risk. During this procedure, the aortic arch is "de-branched" by sewing bypass grafts to the blood vessels of the aortic arch in order to seal off the aneurysm. This procedure is usually done in a hybrid operating suite. Debranching is the best choice for a patient, who is considered too high a risk for a traditional operation.

Renovisceral debranching

This is another highly complex hybrid technique used to repair thoracoabdominal aneurysms and dissections. These types of aneurysms present a formidable surgical challenge and conventional open repair is associated with significant rates of mortality and morbidity including paraplegia. Repair through complete visceral debranching and endovascular aneurysm exclusion is a viable option for older patients, who are at a high risk.

Carotid endarterectomy

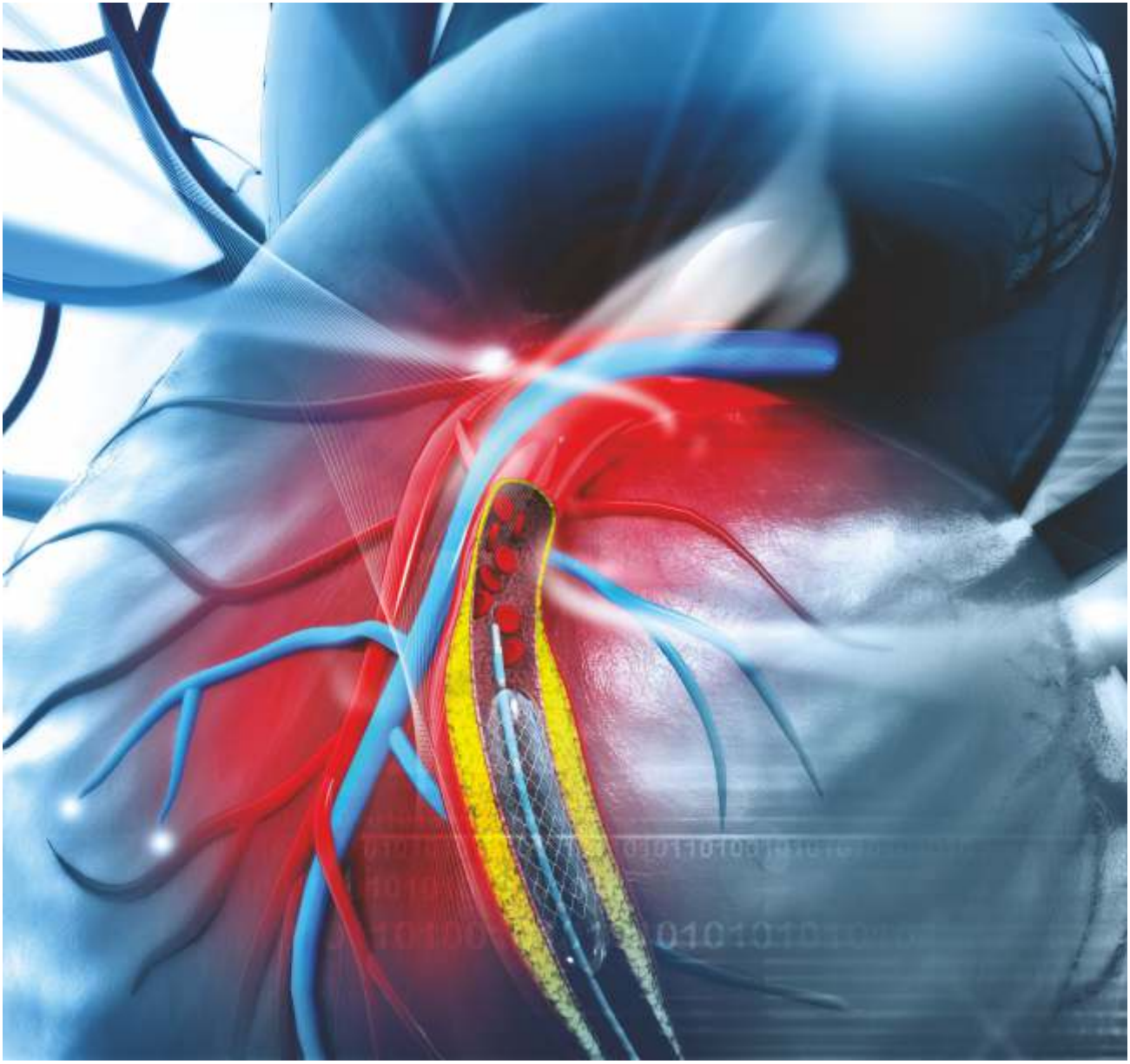
The carotid arteries are major blood vessels in the neck that supply blood to the brain, neck and face. This is a surgical procedure used to reduce the risk of stroke, by correcting the narrowing (stenosis) of the carotid artery. In endarterectomy, the surgeon opens the artery and removes the plaque. A newer procedure, called endovascular angioplasty and stenting, threads a catheter up from the groin around the aortic arch and up to the carotid artery. The catheter uses a balloon to expand the artery, and a stent is inserted to hold the artery open.

Endovascular aortic aneurysm repair

This is a type of endovascular procedure used to treat an aortic aneurysm or dissection. The procedure involves the placement of an expandable stent graft into the aorta without operating directly on the aorta. It is one of the most common techniques used to repair aneurysms or dissections and it reduces the pain and recovery time compared to the open technique.

Carotid bypass surgery

This procedure restores proper blood flow to the brain. Blood flow in one or both of the arteries can become partly or totally blocked by fatty material called plaque. The underlying disease, called atherosclerosis, can reduce the blood supply to the brain and cause a stroke. When other procedures are not appropriate for the patient, the carotid artery can be surgically bypassed to restore blood flow.



Aortobifemoral bypass

This is a procedure used to bypass diseased large blood vessels in the abdomen and groin. If the blockage is in the arteries in the pelvis, the bypass is made from the aorta in the abdomen to the femoral arteries in the groin. To bypass the blocked blood vessel, blood is redirected through a graft made of synthetic material, which is sewn above and below the diseased artery. The artificial blood vessel is formed into a Y shape with a single end attached to the aorta. The two split ends of the Y are sewn below.

Femoro-popliteal /Femoro-Femoral bypass Endo Venous Laser Therapy (EVLT) for Varicose Vein

Varicose vein is a disease in which veins in the leg become elongated, dilated and tortuous. If not treated it will lead to complication i.e. pigmentation, eczema, venous ulcer and bleeding etc. EVLT is a latest technique in which laser fiber is introduced into the leg vein, laser energy is fired and the vein is destroyed. The advantage of this technique is cosmetically good, painless and return to work, the same day. Other possible benefits include a reduced risk of infection, less bleeding and less trauma, decreased length of stay in the hospital and decreased recovery time.

Left ventricular assist device (LVAD) and other complex procedures Left ventricular assist device (LVAD) implantation

One of the most ground-breaking improvements for heart failure patients is the LVAD. The LVAD is a mechanical pump that is implanted inside a patient's chest to help a weakened heart ventricle pump blood throughout the body. It is used as a bridge to transplantation, and also as destination therapy. Destination therapy offers long-term support to terminally ill patients, whose health makes them ineligible for heart transplantation. Health City Cayman Islands performed the very first LVAD procedure ever done in the Caribbean in August 2014 and performed a second successful LVAD procedure in December of that year.

Studies have demonstrated that permanent LVAD devices doubled the one-year survival rate of patients with end-stage heart failure, compared to medication therapy alone. However, implantation comes with risks including infection, stroke and bleeding.

Pulmonary Thrombo Endarterectomy (PTE)

This is a surgical procedure that removes organized clotted blood (thrombus) from the pulmonary arteries. The surgery is performed to improve blood flow and normal gas exchange of the blood so that the patient can breathe easier. It prevents heart failure and premature death, alleviates stress on the right side of the heart by correcting the pulmonary hypertension and improves the patient's quality of life.

PTE is an 8 to 10-hour procedure that involves opening the chest and attaching the patient to a heart-lung machine, then cooling the patient's body to about 64 to 68 degrees Fahrenheit. The cold temperature reduces the body's need for oxygen and provides organ protection. During the critical parts of the surgery, the surgeons turn off the heart-lung machine, stopping blood circulation for up to 20 minutes to create a bloodless surgical field. Then the surgeons open the arteries blocked by chronic clots and scar tissue. They repeat the on-off process with the heart-lung bypass machine until all of the obstructing material is removed.

Emergency cardiac and vascular surgeries

We perform emergency cardiac and vascular surgeries to save lives including those for cardiopulmonary arrest, hypertensive emergency, aortic dissection, chest pain, dysrhythmia and acute pulmonary edema.

THORACIC PROCEDURE

When it comes to matters of the heart and lungs, you should seek out the best physicians in the world, who have the expertise to deliver the highest quality thoracic care. Our experience with complex cardiac and thoracic conditions and knowledge of the latest advances in this area have helped establish Mediheal Hospital as a top hospital for cardiac and thoracic surgery patients from East Africa. We treat a wide range of pathological conditions that affect the chest cavity – in new born infants to older adults. Our thoracic surgeons perform some of the most complex surgeries in the world, with precision and exacting standards that result in improved function, breathing and quality of life for our patients.

At Mediheal Hospital, our thoracic surgeons perform complex thoracic surgeries including:

- Pneumonectomy
- Lobectomy
- Segmentectomy
- Wedge resection
- Decortication
- Pleurodesis
- Thymectomy
- Resection of mediastinal tumours
- Lung biopsy
- Various Esophageal surgery for benign and malignant disease
- Mediastinal tumor

The expert team of cardiothoracic surgeons has extensive experience in complex, life-saving procedures and cardiac care, including advanced, specialized procedures such as robotic and video assisted surgery, minimally invasive mitral valve repair and complex neonatal repairs. The team leverages state-of-the-art infrastructure such as advanced cath labs and cardiac theatres for handling any emergency heart procedure.

The team of surgeons works closely with cardiologists, oncologists, anaesthesiologists, and other non-medical staff such as perfusionists (who operate the heart-lung bypass machines), intensive care staff and operating department personnel to offer the best heart care for our patients.

Cutting-Edge Technology to Ensure Comprehensive Care

The dedicated team of cardiologists and surgeons leverage the most advanced technology and provides comprehensive treatment and care to patients of all age groups suffering from various heart ailments. The technological infrastructure at Mediheal is par excellence with the capacity to identify any disorder or abnormality with precise details.

We boast of the most advanced cardiology care not only in Africa, but in the entire world. The hospital has a team of world-renowned, experienced and highly qualified cardiologists available 24x7 to attend to all cardiac emergencies. We follow the latest international guidelines in performing all cardiac procedures.

Artis Zee

Artis Zee imaging systems provide an appropriate answer and bring major advancement to interventional radiology in several ways. Artis Zee is a revolutionary, multi-axis system for interventional radiology offering variable working height adjustment and large volume 3D imaging. Artis Zee can be positioned with greater flexibility and precision than a conventional system, making it an ideal solution for hybrid rooms.

The Artis Zee imaging chain enables improved visualization of therapeutic devices as well as a range of advanced applications, from cross-sectional imaging of soft tissue at the table-side to enhanced guidance tools that enable to care with greater speed and precision.

Artis Zee is equipped to perform:

- Interventional radiology
- Hybrid procedures
- General vascular applications
- Interventional cardiology
- Electrophysiology
- Paediatric cardiology
- Minimally invasive surgical angiography

The advantages are:

- Reduced radiation dose for your patients, you and your staff
- Optimized image contrast and sharpness without increasing dose
- Efficient and transparent dose monitoring, reporting, and documentation
- CARE+CLEAR portfolio comes standard with every Artis system

The CARE dose reduction program and CLEAR image applications improve radiation protection for patients and staff as well as image quality. Integrated system workflow features help clinical teams conduct procedures more efficiently.

Most importantly, Artis Zee provides the versatility and advanced imaging capabilities to deliver faster, more effective patient care.

State-of-the-art Laboratory Medicine and Radiology

MEDIHEAL HOSPITAL (PARKLANDS), NAIROBI

MEDIHEAL GROUP OF HOSPITALS

MEDIHEAL HOSPITAL AND FERTILITY CENTRE, ELDORET
Nandi Road, P.O. Box: 7905 - 30100, Eldoret, Kenya
T: +254 723 578 895 / 735 864 169
E: info@medihealgroup.com/ info.eldoret@medihealgroup.com

MEDIHEAL HOSPITAL (PARKLANDS), NAIROBI
P.O. Box: 39698 - 00623, Parklands Mediplaza
3rd Parklands Avenue, Opp. Aga Khan Hospital, Nairobi, Kenya
T: +254 73663 8073 / 722 218 416
E: info@medihealgroup.com / customerservice@medihealgroup.com

MEDIHEAL HOSPITAL (PARKLANDS), NAIROBI
6th & 7th Floor, Park Medical Centre, 3rd Parklands Avenue
Opp. Aga Khan Hospital Nairobi, Kenya
T: +254 777 333 333 / +254 702 000 888

MEDIHEAL DIAGNOSTIC, DIALYSIS & DAY CARE CENTRE, NAIROBI
P.O. Box: 39698 – 00623, Real Tower, Hospital Road, Next to KNH
Upper Hill, Nairobi
T: +254 712 935 390
E: info@medihealgroup.com

MEDIHEAL HOSPITAL, NAKURU
Nakuru - Nairobi Highway, P.O. Box:17226 – 20100, Nakuru, Kenya
T: +254 735 000 735 / 78027 8000
E: info@medihealgroup.com / info.nkr@medihealgroup.com

MEDIHEAL HOSPITAL, EASTLEIGH
1st Avenue, Section 3, 19th Street, Opp. Bafra Estate
Adj. to Delta Petrol Pump, Eastleigh
T: +254 781 445 566 / 740 445 566
E: info@medihealgroup.com

MEDIHEAL DIAGNOSTICS & FERTILITY CENTRE, KIGALI
Plot No. 252, Kimihurura Main Road, KN 14 A7,
Near Cadilac Club, P.O. Box: 958, Kimihurura, Kigali, Rwanda
T: +250 78918 4444 / 72660 2020
E: info@medihealgroup.com

mediheal group of hospitals

www.medihealgroup.com

For International Patient Department queries, please contact:
+254 710701708 / internationalpatientservice@medihealgroup.com

E: cardiacsciences@medihealgroup.com
Cardiac Hotline: +254 706 777333