HEALTHY HEART

VOLUME-10 | ISSUE-116 | JULY 05, 2019

Honorary Editor :
Dr. Keyur Parikh

Technologies and trends seeking to advance and change clinical practice.

Usually, CIMS Healthy Heart focuses on treatments that are already available for people with heart disease. However in this article, we're making an exception. Honorary Editor, Dr. Keyur Parikh has selected 10 new Emerging and innovative technologies based on his observation of the world for cardiovascular health which he predicts will be available in times to come.

'How can we take care of patients in their communities?' and 'How can imaging be used innovatively for understanding patient problems early in the disease, so they are not coming to us late with heart diseases ? are the underlining concepts of these innovations.

The new emerging cardiovascular technological advancements, such as the stents, intravascular catheters, heart-lung machine and prosthetic valves have increased treatment options for patients and have created exceptional growth for hospitals and cardiac specialists.

10 New Emerging Cardiovascular Technologies in 2019

The point of highlighting the aforementioned opportunities is not to state that all of these patients shall be treated with new devices but rather emphasize on the many patients remaining underserved. Ultimately, the number of patients treated will be determined by the relative patient benefit and risk. By developing 10 new emerging technologies (STEMI, CHIP, TAVR, TMVR, TTVR, TEVR, PE, LAAO, Imaging-CTA and MRA and Artificial Intelligence), cardiac physicians/surgeons can meet the needs of many of these patients.

Cardiovascular physicians are in a unique position to lead the decision-making and treatment process for a number of reasons. First, cardiac physician and surgeons are very familiar with the relevant anatomy and pathophysiology. Secondly they perform invasive procedures and operations that continue to be important treatment options. Thirdly, cardiac surgeons have the available capacity to perform these procedures. Finally, they are best suited to handle complications related to these treatments.

Although initially posing as a challenge to cardiovascular physicians, emerging technologies represent a significant opportunity. Patients with structural heart disease will benefit from multiple treatment options offered by a multidisciplinary team that is led by uniquely skilled cardiovascular physicians. Given this new treatment paradigm, the future is promising for both cardiovascular physicians and their patients.

10 New Emerging Cardiovascular Technologies-2019:

1. STEMI
2. CHIP
3. TAVR
4. TMVR
5. TTVR
6. TEVR
7. PE
8. LAAO
9. CTA and MRA Imaging
10. Artificial Intelligence

1. ST Elevation Myocardial Infarction (STEMI)

The patient presented with a ST elevation myocardial infarction (STEMI) or its equivalent as documented in the medical record. STEMIs are characterized by the presence of both criteria:

A. ECG evidence of STEMI: New or presumed new ST-segment elevation or new left bundle

branch block not documented to be resolved within 20 minutes. ST-segment elevation is defined by new or presumed new sustained ST-segment elevation at the J-point in two continous electrocardiogram (ECG) leads with the cut-off points: >=0.2 mV in men or >= 0.15mV in women in leads V2-V3 and/or >= 0.1 mV in other leads and lasting greater than or equal to 20 minutes. If no exact ST-elevation measurement is recorded in the medical chart, physician's written documentation of ST-elevation or Q-waves is acceptable. If only one ECG is performed, then the assumption that the ST elevation persisted at least the required 20 minutes is acceptable. Left bundle branch block (LBBB) refers to new or presumed new LBBB on the initial ECG.

B. Cardiac Biomarkers (creatinine kinase-myocardial band, Troponin T or I) exceed the upper limit of normal according to the individual hospital's laboratory parameters a clinical presentation which is consistent or suggestive of ischemia.

Goals of Treatment in STEMI:

1. Coronary Artery Reperfusion
2. Limit Myocardial Injury / Infarct Size
3. Resuscitation of Sudden Cardiac Death
4. Treatment of Cardiogenic Shock

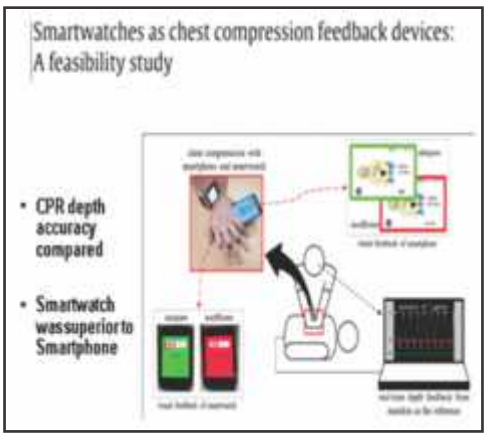
Obstacles in STEMI Treatment

- Time Delays
- Pain-to-Reperfusion
- Door-to-Reperfusion
- Return of Spontaneous Circulation (ROSC)
- Restoration of End Organ Perfusion in Shock
- Reperfusion / Post-Infarct Injury

What happens if there is cardiac arrest?

Somebody Start Cardio-Pulmonary Resuscitation (CPR) !

- Problems with CPR Inadequate Depth and Pace of Compressions
- Interruptions Due to Fatigue and to Defibrillate
- Disruptive technology is impacting STEMI care at the individual and health system level.
- Door-to-Balloon (DTB) times, although critical in STEMI care, may have reached an outcome plateau.



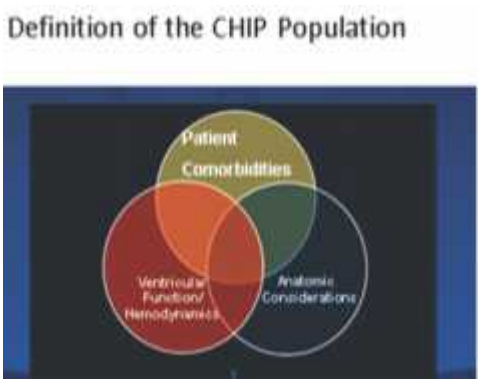
- Pain to Balloon Time
- Modern communication platform offers the prospect to improve response time for STEMI and Out-of-hospital cardiac arrest (OOHCA).
- Automated Cardio-Pulmonary Resuscitation (CPR) has an increasing role in STEMI care
- Mechanical Support Devices and other novel techniques are emerging that may limit infarct size and improve outcomes.

2. What is CHIP? Complex High Risk Interventional Procedures

CHIP is a rapidly growing sub-specialty which requires specialized training in advanced technical and cognitive skills to assess and treat a high-risk/complex group of under served patients!

- Complex
- High Risk
- Interventional
- Procedures

There is a large population, who make it to the hospital alive that can benefit from revascularization rather than focusing on low-risk patients who may be “easy to treat”. We need to focus on higher-risk patients who have most to gain The development of specialists trained with advanced technical and cognitive skills to treat these patients is clearly needed.



CHIP in the Next 5-10 Years What to Expect:

- CHIP Hospital – Develop CHIP based hospital with full availability of Optical coherence tomography (OCT), Intravascular ultrasound (IVUS), full Heart Team and Extracorporeal membrane oxygenation (ECMO) / Tandem Heart/Impella Devices as well as computed tomography angiogram (CTA), Cardiac MR.
- CHIP awareness – educate the CV community of the clinical imperatives and marked value of treating the CHIP population (social media)!
- CHIP training – massive effort to train the designated interventional teams on skills, techniques, and advanced treatment algorithms.
- CHIP evidence – need to generate clinical evidence to support the CHIP initiatives and value propositions (registries, databases, manuscripts)
- CHIP innovation – embrace, employ, and iterate new diagnostics and catheter-based therapies!

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Identify potentially underserved high risk population. Raise awareness in the general and specialized Physician community of this high-risk, underserved, population. Promote educational initiatives for enhanced cognitive and technical skills in the interventional cardiology community to effectively treat these patients. Initiate disease and procedure based research to better define the treatment population assess outcomes.

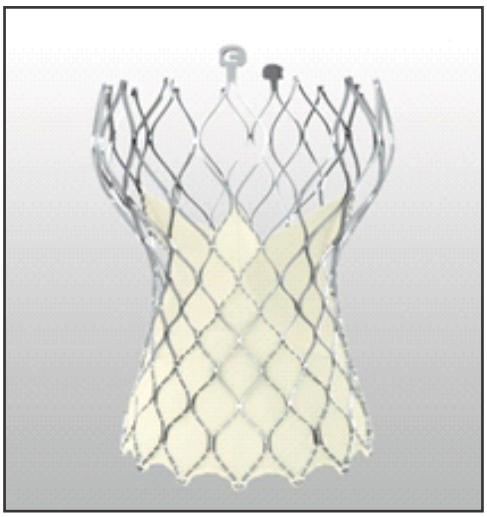
3. Transcatheter Aortic Valve Replacement (TAVR)

Transcatheter aortic valve replacement (TAVR) is a minimally invasive procedure to replace a narrowed aortic valve that fails to open properly (aortic valve stenosis). Transcatheter aortic valve replacement is sometimes called transcatheter aortic valve implantation (TAVI).

TAVR may be an option for patients who are considered at intermediate or high risk of complications from surgical aortic valve replacement. TAVR may also be indicated in certain people who cannot undergo open-heart surgery. The decision to treat aortic stenosis with TAVR is made after consultation with a multidisciplinary group of medical and surgical heart specialists who together determine the best treatment option for each individual.

TAVR can relieve the signs and symptoms of aortic valve stenosis and may improve survival in patient who cannot undergo surgery or have a high risk of surgical complications.

TAVR may also be an option if you have an existing biological tissue valve that was previously inserted to replace the aortic valve, but is not functioning well anymore.



CoreValveTM EvolutTM RTAVR System

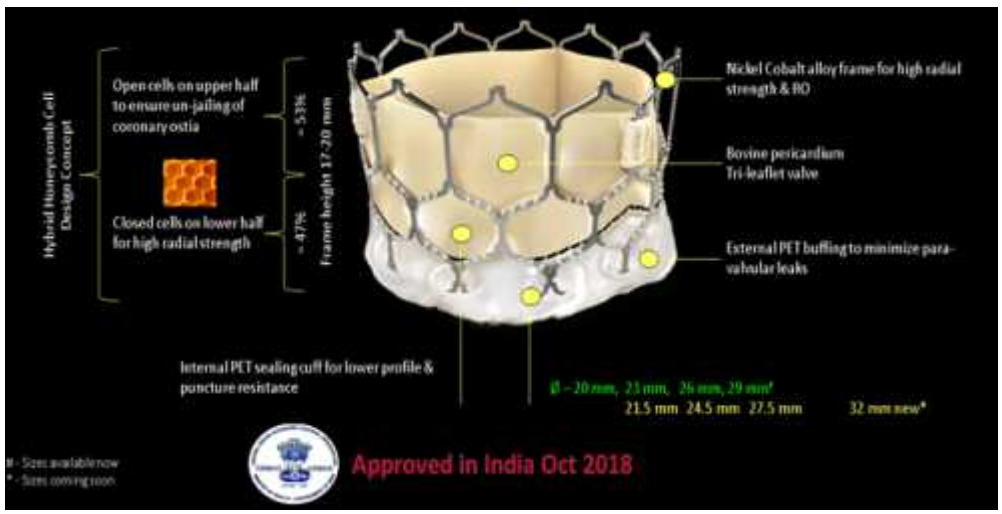
4. Transcatheter Mitral Valve Repair (TMVR)

Those patient who cannot undergo surgery, transcatheter mitral valve repair (TMVR) provides a newer, minimally invasive option for treating the most common form of mitral valve leakage.

We have several years of experience successfully implanting the MitraClip®, the first device approved by the Food and Drug Administration (FDA) for TMVR. If a patient's mitral heart valve is allowing blood to leak backward, and you cannot undergo surgery, this procedure may correct the problem and improve patient's quality of life.

The MitraClip® is inserted in a minimally invasive procedure through the femoral vein in the leg and guided into the heart's left ventricle where it grasps the two leaflets of the mitral valve, clipping them together to reduce the backflow of blood.

The MitraClip®, manufactured by Abbott Vascular, is intended to reduce moderate-to-severe or severe mitral regurgitation, "Expanding the approval of this device to heart failure patients with significant secondary mitral regurgitation, who have failed to get symptom relief from other therapies, provides an important new treatment option,"



MyVal – Balloon Expandable THV Design Philosophy

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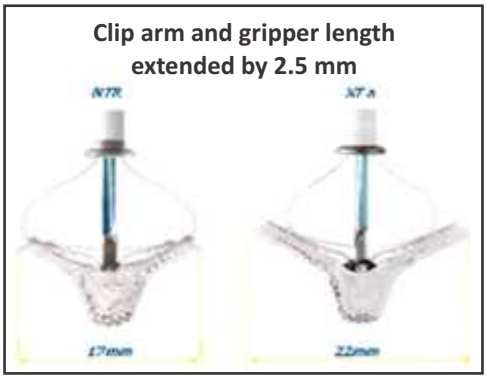
Abbott MitraClip NT(R) and XTr Repair System

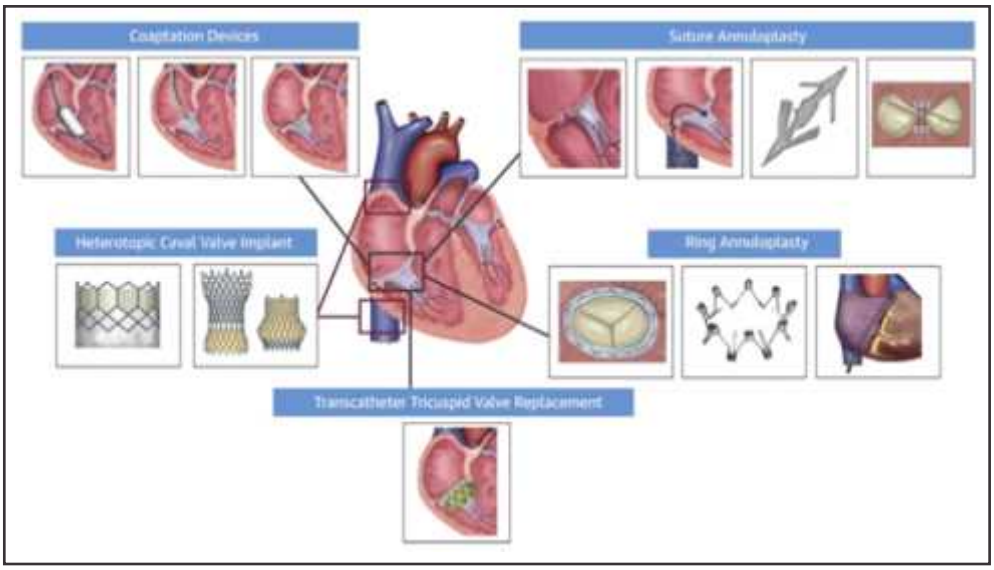


5. Transcatheter Tricuspid Valve Therapies (TTVR)

Tricuspid Regurgitation (TR) has long been an overlooked condition and not clinically well understood. Isolated Tricuspid Valve (TV) surgery is not common and carries a high mortality risk .

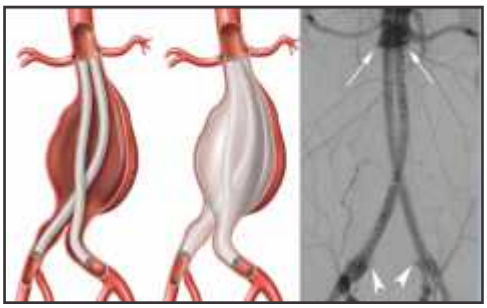
Challenges of Transcatheter Tricuspid Valve Therapies

- Large tricuspid annulus size
- Non-planar and elliptical annulus shape
- Fragility of tricuspid anular tissue and narrower annular shelf in comparison to mitral annulus
- Non calcified annulus in secondary tricuspid regirgitation
- Angulation in relation to superior and inferior vena cava
- Trabeculated right ventricle, muscular bands and chordae tendinae
- Thin right ventricular free wall
- Proximity of AV-node and right his bundle branch
- Proximity of the right coronary artery to annulus and risk of coronary injury
- Risk occlusion of coronary sinus, vena cava or outflow tract
- Slow-flow in right ventricle
- Patients with pacemaker or defibrillator leads



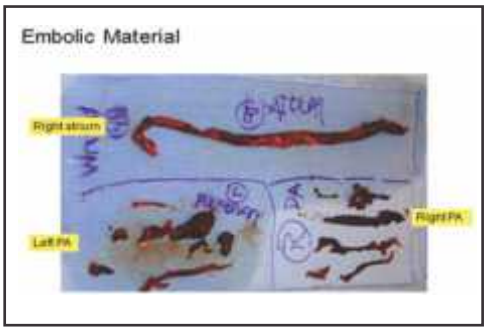
6. Thoracic Endovascular Repair (TEVR)

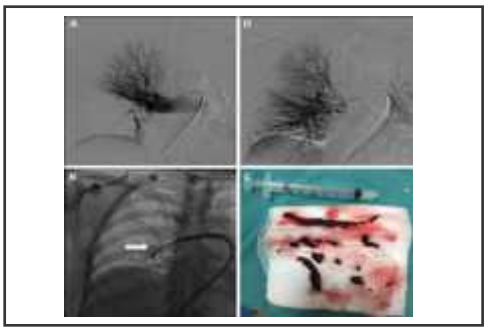
Thoracic endovascular repair (TEVR) is currently the treatment of choice for acute, complicated Type B dissection, as it confers a clear mortality advantage over open repair. However, for sub-acute and chronic complicated Type B dissection, the place of TEVR is less defined. The literature reporting TEVR outcomes in non-acute dissections is scant (as well as heterogeneous) and most focus primarily on the early impact of TEVR in Type B aortic dissection and not on mid- to long-term outcomes.



7. Pulmonary Embolism(PE)

Pulmonary embolism (PE) is a blockage in one of the pulmonary arteries in the lungs. In most cases, pulmonary embolism is caused by blood clots that travel to the lungs from the legs or, rarely, other parts of the body (deep vein thrombosis).





WHAT IS THE ROLE OF THROMBOASPIRATION?

- **Potential to debulk Acute Pulmonary Embolism in intermediate risk PE?**
  - **Reduce/eliminate the need for overnight lysis**
- **Potential to replace surgical embolectomy in high risk patients?**
  - **Reduce the morbidity of open surgery**
  - **Expand thrombo-embolectomy to patients considered high-risk?**

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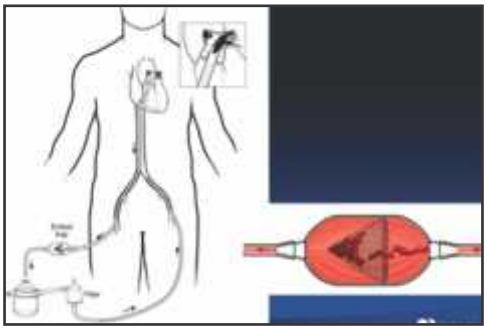
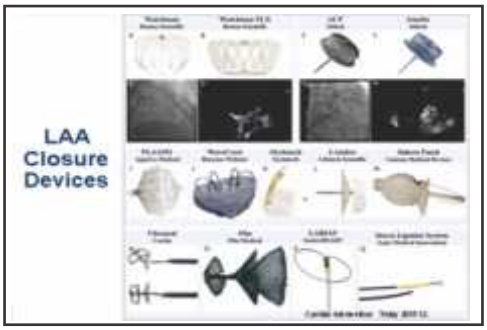
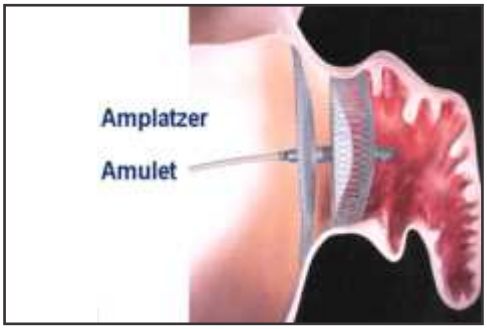


8. Left Atrial Appendage Occlusion (LAAO)

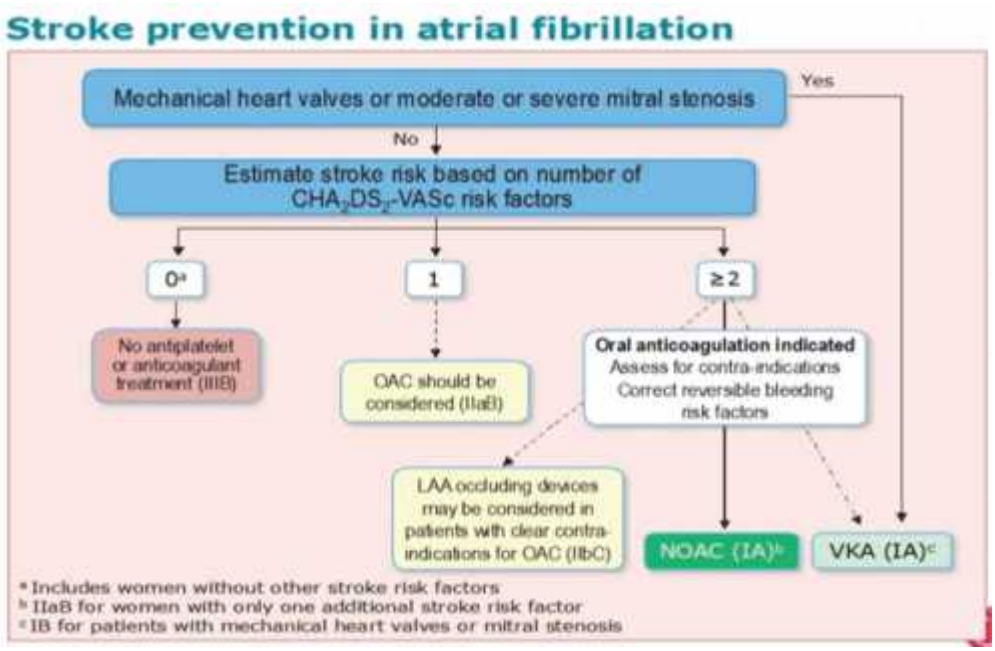
Ischemic stroke is the most common clinical manifestation of embolic events from atrial fibrillation. While anticoagulation treatment is the preferred treatment, unfortunately, many patients have contraindications for anticoagulation treatment making this option unavailable to them. Most thrombi (>90%) that form in association with non-valvular atrial fibrillation occur in the Left atrial appendage occlusion (LAAO).

Isolating the LAA from the body of the left atrium might reduce the risk of embolic events and that LAA obliteration may be a treatment option for patients with atrial fibrillation who are not candidates for anticoagulation treatment.





Catheter-based LAA occlusion procedures are becoming a possible alternative for the treatment of patients with atrial fibrillation and

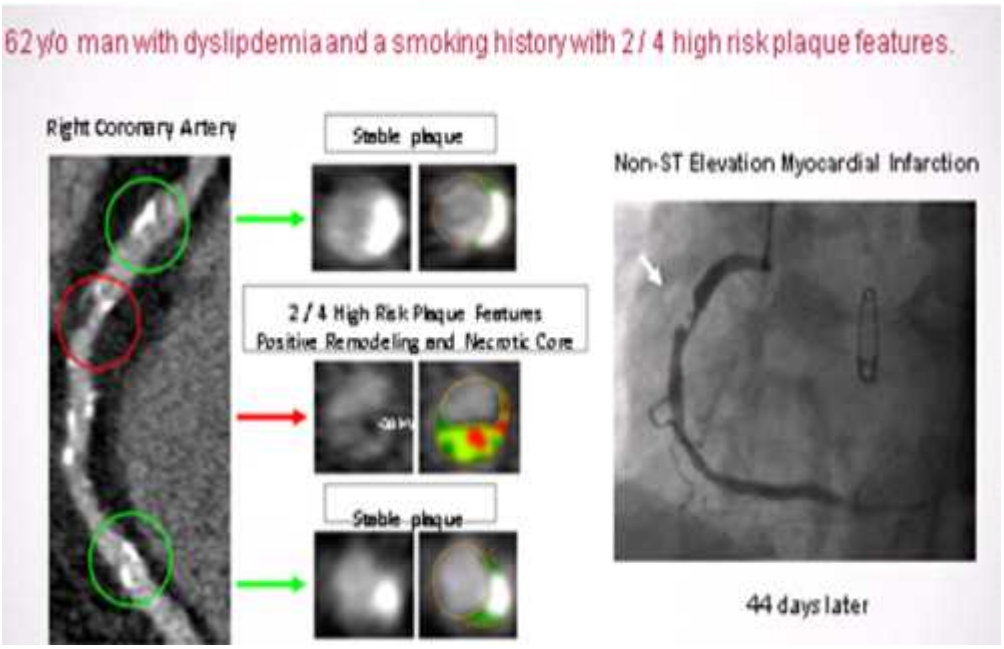


contraindications to oral anticoagulation therapy.

This procedure is done utilizing TEE surveillance and guidance. The currently available real-time three-dimensional (RT3D) imaging is a powerful additional tool that may help in improving the safety profile of the procedure. It allows accurate assessment of LAA anatomy, suitability for device implantation, continuous visualization of all intra-cardiac devices and catheters during the procedure, and clear delineation of device positioning in the LAA.

9. Computed Tomography Angiography (CTA)&Magnetic Resonance Angiography (MRA) : Imaging

It's relatively new to coronary artery disease (CAD) detection; computed tomography angiography (CTA) is already facing some competition. New studies are pointing to magnetic resonance angiography (MRA) as equally effective in doing the same thing, without exposing patients to ionizing radiation.



10. Artificial Intelligence (AI):

Artificial Intelligence (AI) is a general term that implies the use of mathematical algorithms which give machines the ability to reason and perform cognitive functions such as problem solving, object/word recognition and decision-making.

AI might significantly impact clinical care, Big Data research, image and intra-procedural video analysis, evidence-based, real-time clinical decision support, and robotics. Currently, AI is not a replacement for human intellect. Rather, it has the potential to complement and reinforce it. Cardiologists and Physicians need to be prepared for the upcoming AI era.

In the field of clinical cardiology, so far one study has shown that deep learning algorithms clearly outperformed clinicians in predicting prognosis and future events in patients with pulmonary hypertension. In another study, machine learning has helped to develop a clear phenotypic classification of heart failure patients with preserved ejection fraction. Further cardiovascular research based on artificial intelligence tools is underway.

Because of its potential to change the way of how we generate knowledge, interpret data and make decisions, artificial intelligence may trigger uncertainties and reservations among healthcare providers and clinicians

Cardiology based Artificial Intelligence emerged because more familiar algorithms can often be improved on for real-world tasks.

CIMS HOSPITAL

Pioneers of Heart Transplant in Gujarat

HEART TRANSPLANT
JUNE 20, 2019

15 year old brain-dead boy keeps 42 year old man's heart beating

A 15 year old boy, son of an ex-Army Officer, who was declared brain dead after a road traffic accident in Porbandar, donated his heart to a 42 year old man suffering from Heart Failure.

The young boy's father dream was to see his son serving the nation and so the boy was taking his army training from Sainik School, Chandigarh. Despite the road accident cutting those dreams short, the father in a brave humane decision donated all the organs of the body to serve and save other lives.

The Heart was brought to CIMS Hospital through a green corridor.

The Heart Transplant surgery was successful and the patient is doing well at present.

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ECMO
(Extracorporeal Membrane Oxygenation)
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ONE OF THE FIRST IN GUJARAT

TAVR
(Transcatheter Aortic Valve Replacement)
ONE OF THE FIRST IN INDIA & THE FIRST IN GUJARAT

A Procedure to replace the diseased valve without surgery

TAVR
(Transcatheter Aortic Valve Replacement)

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- Lung & Liver Transplant
  First in Gujarat

- Paediatric Bone Marrow Transplant Unit for Thalassemia - First in Gujarat
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CSR HEALTH IMPACT AWARDS

CIMS Foundation has been Felicitated as **Champions** in the category of **"Health CSR Project"** at New Delhi.
An initiative of India Health and Wellness Council
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CIMS Learning Centre

Skills Development Centre

GASTRO UPDATE

July 21, 2019 (Sunday)

Course Directors : Dr. Bhavesh Thakkar / Dr. Abhinav Jain
Duration : 1 day
Number of Seats : 50
Venue : CIMS Auditorium

Programme Highlights:

- Experienced national faculty
- Interactive clinical sessions
- Handout of Indian national guidelines in respective disorders

Programe Overview:

Insightful sessions with faculty to sharpen the clinical assessment & decision making skills in a variety of gastrointestinal disorders. The clinically oriented sessions will be conducted on GI bleeding, diarrhea, constipation, reflux disease (GERD) and non alcoholic fatty liver disease. The western guidelines and textbooks do not provide insight into the unique problems in our population and, hence the emphasis here will be on Indian guidelines and scenario and application of that knowledge into our routine practice. The programme also includes hands-on workshop on upper endoscopy (only few seats).

Online registration & payment on www.cims.org /clc

Registration Fees: ₹ 500/- | Spot Registration Fees: ₹ 1,000/-

Non-refundable

For any query, please email on : clc@cimshospital.org

› Certificate of attendance will be given at the end of the course.

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