HEALTHY HEART

VOLUME-11 | ISSUE-123| FEBRUARY 05, 2020

Honorary Editor :
Dr. Urmil Shah

Significant number of Patients have varying degree of calcium in their coronary arteries, especially more so in patients with family history, elderly , diabetic, tobacco users, Indian origin. Coronary artery calcification (CAC) hinders percutaneous coronary intervention (PCI) by impairment of device crossing, impairment of stent apposition and expansion. High-pressure noncompliant balloon dilation, specialty balloons (scoring, cutting, ultra-high pressure), and atherectomy are techniques commonly used to facilitate PCI in severe CAC; however, all suffer from significant limitations. Specialty balloons, including scoring, cutting and ultra-high pressure balloons lacks robust trial data resulting in conservative recommendations for their use in societal guidelines. Rotational and orbital atherectomy while highly effective, still may potentially leave significant calcium unmodified within the lesion. Peri-procedural complications including slow-flow, peri-procedural myocardial infarction and perforation are also known to be significantly high with atherectomy. In this article, we will discuss newer moralities called Intravascular Lithotripsy (IVL) in managing calcific coronary as well as peripheral arterial lesion.

Intracoronary Lithotripsy for the treatment of Calcified Plaque: A Novel Technology

Intravascular lithotripsy (IVL) commonly known as shockwave therapy is a novel technique based on the same principle of an established treatment strategy for renal calculi, in which multiple lithotripsy emitters mounted on a traditional catheter platform deliver localized pulsatile sonic pressure waves to circumferentially modify vascular calcium.

Typical Indications for use of Intravascular Lithotripsy

- Coronary calcification noted on fluoroscopy or noninvasive imaging (i.e. Computed tomography coronary angiogram)
- Evidence of an undilatable lesion despite high-pressure noncompliant balloon dilatation for lesion preparation
- Evidence of heavy calcification noted on intravascular imaging, either optical coherence tomography or intravascular ultrasonography.

Figure 1: IVL equipment. Pulse-generating console attached to the wand device used to connect console to lithotripsy balloon

The Coronary Intra Vascular Lithotripsy (IVL) System

The Coronary IVL System consists of a portable, rechargeable generator, (**Figure 1)** a connector cable with a push button to allow manually controlled delivery of electric pulses, and a 6 Fr compatible, rapid-exchange, semi-compliant balloon catheter **(Figure 2)** to be used on 0.014" guidewire as used in standard angioplasty.

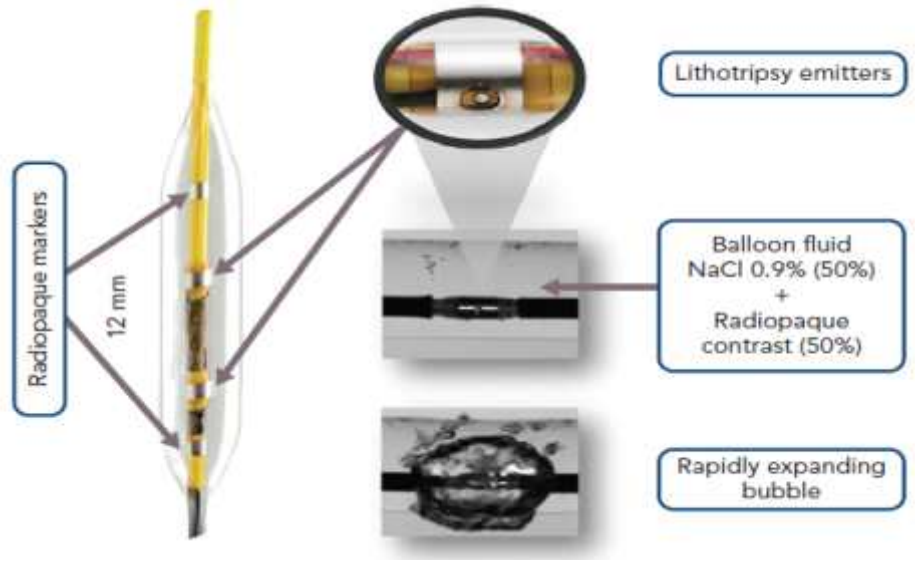
The semi-compliant balloon available in different sizes, integrates two

Figure 2: Intravascular Lithotripsy Balloon

radiopaque lithotripsy emitters 6 mm apart and these emitters receive electrical pulses from the generator vaporizing the fluid (a standard mixture of 50% Normal Saline 0.9% and 50% radiopaque contrast) within the balloon and creating a rapidly expanding and collapsing bubble. This bubble can transmit unfocused circumferential pulsatile mechanical energy into the vessel wall in the form of sonic pressure waves equivalent to approximately 50 atmospheres **(Figure 3)**. After advancing the IVL catheter to the target lesion guided by radiopaque markers on the catheter, the balloon is inflated at 4 atm pressure to contact with vessel wall, facilitating optimal energy delivery. The lithotripsy cycle once activated and pulses one per second for ten seconds are generated. After every cycle, the balloon is inflated up to 6 atm pressure, which compresses the fractured calcium with maximum 8 repeatable cycle with the same catheter.

The Coronary IVL System, with controlled pulses delivered under low pressure, might potentially improve plaque modification with a lower risk of vessel closure, perforation or embolization and is very useful in undilatable lesion due to heavy calcification.

Figure 3: Intravascular Lithoplasty Therapy



Advantages and disadvantages of Intravascular Lithotripsy compared with other methods of calcium modification

Advantages

- Provides a more controlled means of calcium modification
- Has the ability to modify calcification without further vessel injury with minimal trauma on soft tissue
- Less complications like no-reflow/ slow flow and perforation compared to atherectomy device.
- Technically less demanding when compared with atherectomy and hence has a short learning curve to become familiar with the technology.
- Tackle both superficial and deep calcium
- More useful for concentric calcium

Disadvantages

- Bulky balloon makes crossing of lesion troublesome.

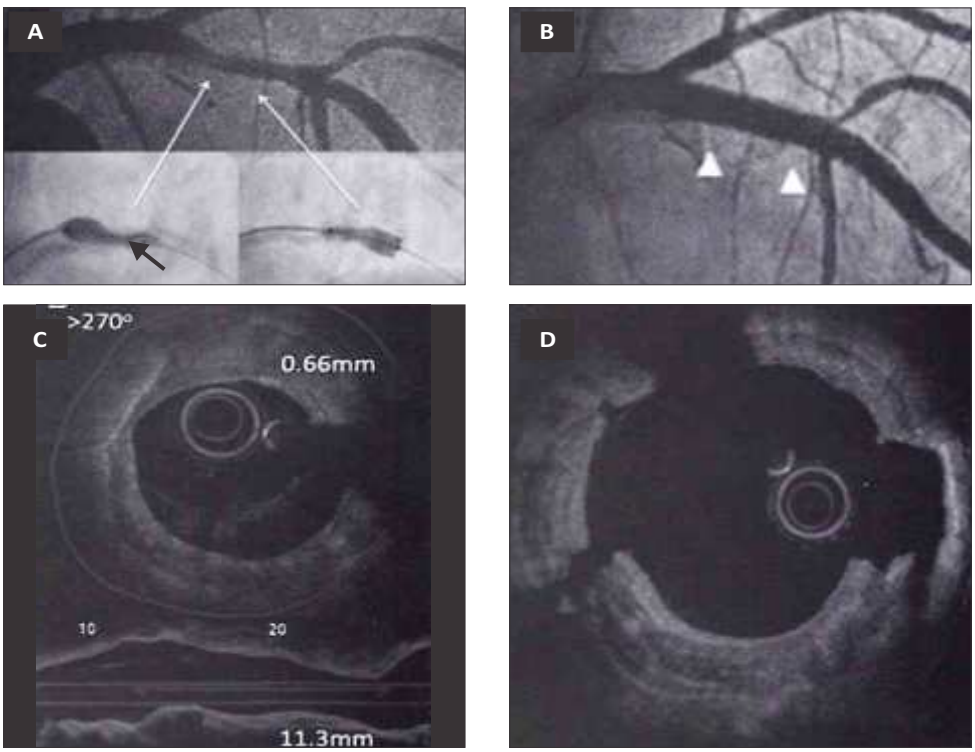
Potential Uses

At present, Shockwave Coronary IVL System is used mainly for lesion preparation in native coronary arteries **(Figure 4)** with severe calcific and undilatable lesion which otherwise carries the risk of stent under expansion and subsequent re-stenosis or thrombosis. OCT criteria like calcification greater than 180 degree in circumference and calcium length greater than 5 mm are very useful to identify such lesion. IVL is especially more useful and safe compare to other methods of calcium modification in calcific left main disease, where atherectomy is associated with high complication rate. Rotational atherectomy may be unsuccessful when entire burden of calcification is present in deep circumference, where IVL can be very helpful.

Shockwave Lithoplasty Clinical Data

The Disrupt Coronary Artery Disease (Disrupt-CAD) study which was presented at TCT Conference in 2016 is a prospective multi-centre, single-arm study enrolling 60 patients with severely calcified lesions treated with shockwave coronary IVL. The main inclusion criteria was severely calcified lesions in a native coronary artery with $\geqslant$ 50 percent

HEALTHY HEART
VOLUME-11 | ISSUE-123| FEBRUARY 05, 2020



A. Mid LAD lesion - IVL Balloon showing dog bone effect (arrow) due to heavy calcification
B. Excellent final angiographic result
C. Evidence of circumferential, deep and long calcification on OCT
D. Evidence of calcium fractures post IVL on OCT

diameter stenosis and >32 mm length. The primary performance endpoint was clinical success defined as a residual diameter stenosis of <50 percent following stenting without in-hospital major adverse cardiovascular events (MACE: composite of cardiac death, myocardial infarction or target vessel re-vascularization). The primary safety endpoint was freedom from MACE through 30 days follow-up.

This study demonstrated compelling safety and performance results. Shockwave IVL treatment was highly effective in facilitating the delivery of stents and reducing re-stenosis. Stent deployment was successful in all patients with reduction in residual stenosis to less than 50 percent despite all patients having more than 90 percent of heavily calcified lesions. There were no major intra-procedural complications including perforation, embolization, slow-flow or no reflow and a low MACE rate out at 6 months (8.5 percent). Consistent, reproducible luminal gain was also achieved. The clinical success rate was achieved in 57 (95 percent) patients; limited only by 3 (5 percent) asymptomatic non-Q-wave MI. IVL catheter delivery and treatment at the target lesion was successful in 59 (98.3 percent) patients. The primary safety endpoint of 30-day MACE rates were achieved. There were no cardiac deaths, Q-wave MIs or target vessel re-vascularizations during this time.

Future Prospects for Intervascular Lithotripsy

The shockwave intravascular lithotripsy is an innovative approach for treating severely calcified lesions during angioplasty. Initial clinical experience using IVL for lesion preparation in real-world patients with severely calcified lesions has been promising, resulting in excellent final angiographic and OCT results. It has also demonstrated that IVL was effective in cracking the thick (more than 180 degree) calcium burden. **Recently Shockwave Therapy (IVL) has been approved in India by DCGI for calcific native coronary artery disease. Recently we had performed three angioplasty at CIMS Hospital in highly calcific lesions with very good result and without any complications.** It is also useful in calcific peripheral artery blockage using large diameter balloon.

Take Home Message

- Intravascular Lithotripsy (IVL) has shown to be a safe and feasible alternative method for coronary calcium modification.
- The Coronary IVL System is a promising new treatment modality to tackle moderate to severe calcified coronary lesions, with a high rate of success and low risk of complications.
- Indications for the use of IVL include coronary calcification noted on angiographic fluoroscopy, the presence of an undilatable lesion, stent underexpansion, and a heavy calcium burden noted on intra-vascular imaging.
- There are several specific clinical scenarios in which IVL can be advantageous, particularly in left main stem intervention, when other methods such as atherectomy, have been associated with more complications.
- **Larger studies and long-term clinical data are needed to confirm the safety and efficacy of this technique with special attention to the effects on cardiac conduction and vessel healing response. Randomized controlled clinical trials are required to evaluate its superiority against currently available calcium-modifying devices like rotational atherectomy.**

CIMS HOSPITAL

CIMS CRITICAL CARE

Because every second counts...

WE CARE FROM THE VERY FIRST SECOND

YOUR FIRST AND BEST OPTION

OUR HIGHLIGHTS ARE

1st Electronic ICU

- **ECMO** (Extracorporeal Membrane Oxygenation)
- **CRRT** (Continuous Renal Replacement Therapy)
- **Green Concept ICU**
- **HFNC** (High Flow Nasal Cannula)
- **Post ICU Care Clinics**
- **Isolation Ward**

WE ARE BEST AT

- Trauma
- Poisoning
- Heart Disease
- Neurological Emergencies like Stroke
- High Risk Pregnancy
- Cancer Care
- Serious Infectious Disease
- Kidney Failure
- Liver Failure
- Pneumonia

AN EXPERIENCED TEAM OF DOCTORS AND NURSES
ALONG WITH ALLIED PROFESSIONALS
DIETICIAN / PHYSIOTHERAPIST / RADIOLOGIST / PATHOLOGIST / ICU TECHNICIANS /
COUNSELLOR / PHARMACISTS

PATIENT FRIENDLY APPROACH

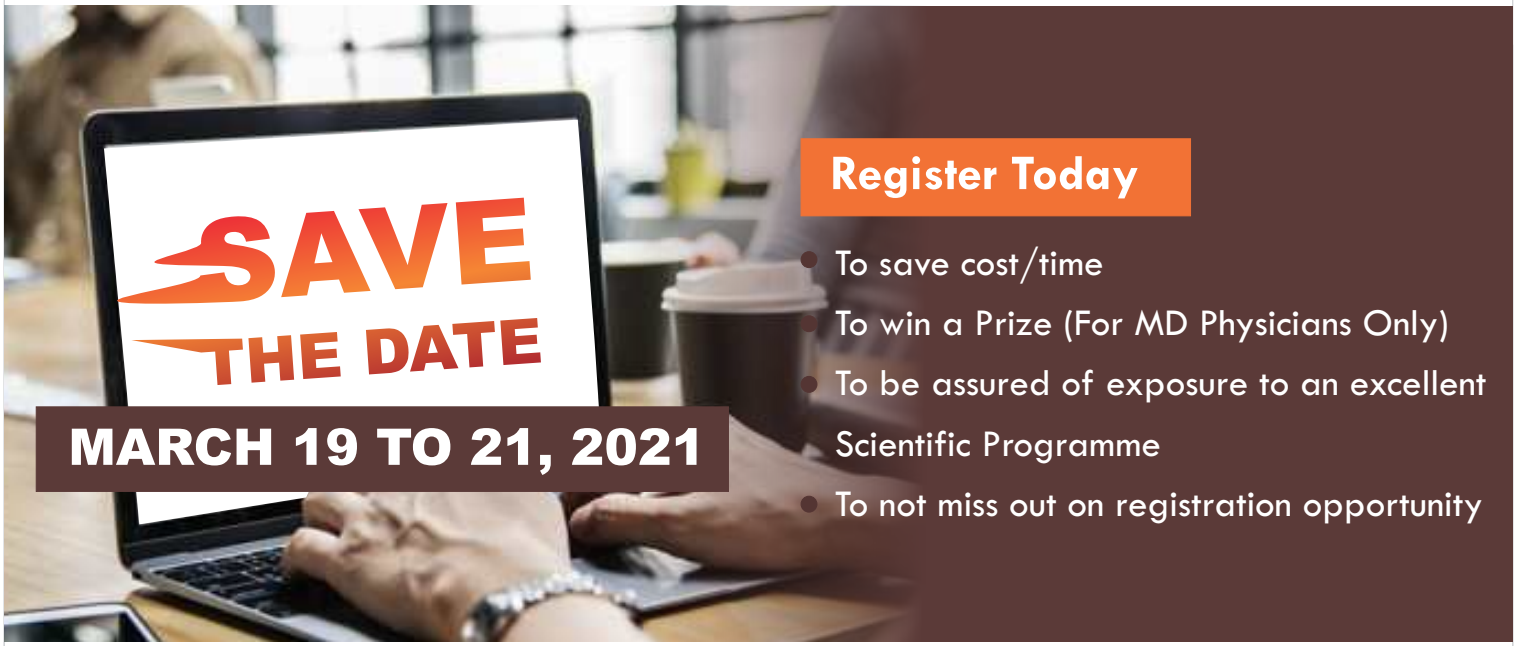
- Early Mobilization
- Early Feeding
- Best in Class Infection Control
- Music Therapy
- Holistic Approach to Patient Care
- Palliative Care / End of Life Care
- Continuing Care at Home

WE WELCOME DR. MINESH PATEL AS PART OF CIMS CRITICAL CARE TEAM

DR. BHAGYESH SHAH	DR. VIPUL THAKKAR	DR. MINESH PATEL
Mo. +91-90990 68938	Mo. +91-90990 68935	Mo. +91-98791 19764

JIC 2021
Joint International Conference
March 19-21, 2021

17th Annual Scientific Symposium
26th Year of Academics



Register Today

- To save cost/time
- To win a Prize (For MD Physicians Only)
- To be assured of exposure to an excellent Scientific Programme
- To not miss out on registration opportunity

FOR MD PHYSICIANS
₹ 2,000/-* Only

*UPTO APRIL 30, 2020

FOR MD STUDENTS
₹ 1,000/-* Only

Organized by
GMERS Medical College , Sola, Ahmedabad

Supported by
CIMSRE Care Institute Medical Society for Research and Education

In Association with
United We Create Glory ESTD 1970

Conference Secretariat
CIMS Hospital, Off. Science City Road, Sola, Ahmedabad - 380060.
Ph.: +91-79-2772 1059/1060
Fax : +91-79-2771 2770 (M) +91-90990 66538
Email : communication@cimshospital.org | www.jicindia.org

THE EVER EXPANDING NEW MEDICAL TEAM AT CIMS

DR. MINESH PATEL
MBBS, MD(Pulmonary Medicine - Gold Medalist),IDCCM,
DAA(Diploma in Allergy & Asthma)
Consultant Intensivist & Pulmonologist

FOR APPOINTMENT : +91-79-4805 1008 (M) +91-98250 66661

CIMS HOSPITAL

10th Year of CIMS

ONLY HOSPITAL IN GUJARAT

HEART • LIVER • KIDNEY • BONE MARROW • LUNG (Licenced)

ALL TRANSPLANTS UNDER ONE ROOF

LAUNCHING CIMS LIVER TRANSPLANT

Dr. ANAND K. KHAKHAR
LIVER TRANSPLANT. HPB SURGEON.
MS, DNB, Fellow ASTS
Program Director & Sr. Consultant,
Centre for Liver Disease & Transplantation
Liver Transplant and Hepatobiliary Surgery, CIMS Hospital
Dr. B.C. Roy Awardee
Helpline : +91-98707 66626
Email : anand.khakhar@cimshospital.org

OUR EXPERTISE

- LIVER, BILIARY & PANCREATIC DISORDERS
- LIVER CIRRHOSIS
- LIVER CANCER
- ACUTE LIVER FAILURE
- LIVER TRANSPLANT

CIMS Learning Centre

Skills Development Centre

Recent Advances in Management of Arthritis

March 22, 2020 (Sunday)

Course Directors	:	Dr. Puja Srivastava / Dr. Reena Sharma
Duration	:	1 day
Number of Seats	:	50
Venue	:	CIMS Auditorium

Programme Highlights:

- Post Chikungunya Arthritis
- Rheumatoid Arthritis
- Spondyloarthritis
- Juvenile Idiopathic Arthritis
- Gout
- Panel Discussion: 8 to 10 Real Life Cases

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

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

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

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

CIMS®
CARE INSTITUTE OF MEDICAL SCIENCES
Earning Trust with World-Class Practices

HEALTHY HEART
VOLUME-11 | ISSUE-123| FEBRUARY 05, 2020

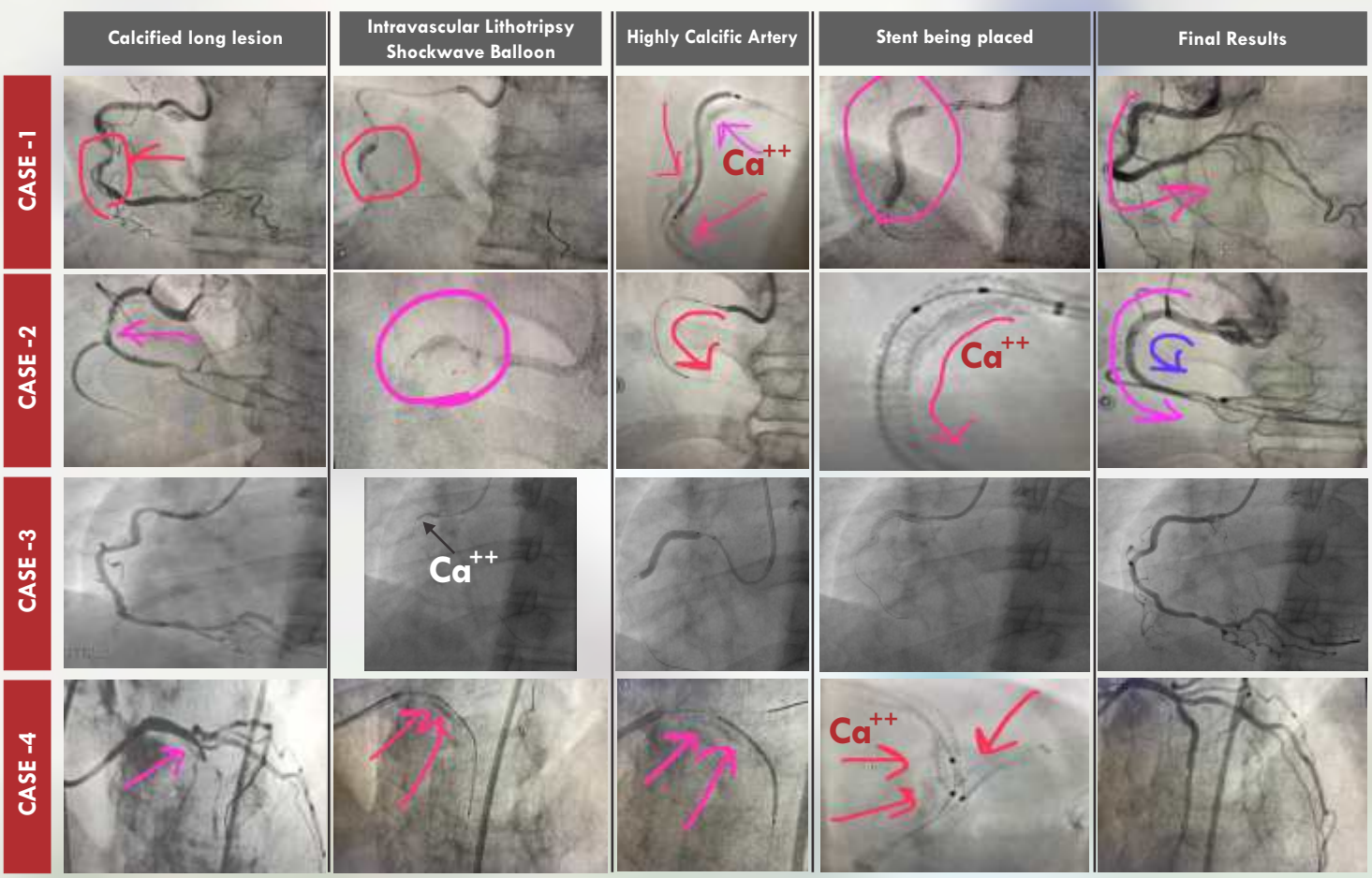
CIMS CARDIOLOGY

30 Years Experience | **20** Years Group Practice | **10** Years CIMS Hospital

A MATTER OF
- TRUST
- SAFETY
- INNOVATION

1ST IN INDIA

3 Consecutive Transradial and 4th Femoral Intra-Vascular Lithotripsy (Shockwave IVL)



Shockwave IVL (Intra-Vascular Lithotripsy) is a new technology which uses acoustic Sonic Waves to break down heavily calcified block in coronary arteries.

HEALTHY HEART
VOLUME-11 | ISSUE-123| FEBRUARY 05, 2020

CIMS®
CARE INSTITUTE OF MEDICAL SCIENCES
Earning Trust with World-Class Practices

Healthy Heart Registered under RNI No. GUJENG/2008/28043
Published on 5th of every month
Permitted to post at PSO, Ahmedabad-380002 on the 12th to 17th of every month under
Postal Registration No. GAMC-1725/2018-2020 issued by SSP Ahmedabad valid upto 31st December, 2020
Licence to Post Without Prepayment No. PMG/HQ/055/2018-20 valid upto 31st December, 2020

If undelivered Please Return to :

CIMS Hospital, Nr. Shukan Mall,

Off Science City Road, Sola, Ahmedabad-380060.

Ph. : +91-79-2771 2771-72

Fax: +91-79-2771 2770

Mobile : +91-98250 66664, 98250 66668

Subscribe "Healthy Heart" : Get your "Healthy Heart", the information of the latest medical updates only ₹ 60/- for one year. To subscribe pay ₹ 60/- in cash or cheque/DD at CIMS Hospital Pvt. Ltd. Nr. Shukan Mall, Off Science City Road, Sola, Ahmedabad-380060. Phone : +91-79-2772 1059 / 2772 1060. Cheque/DD should be in the name of : **"CIMS Hospital Pvt. Ltd."** Please provide your **complete postal address with pincode, phone, mobile and email id** along with your subscription

CIMS Learning Centre

Skills Development Centre

Basic ECG Learning Course

March 08, 2020 (Sunday)

Course Directors	:	**Dr. Vineet Sankhla / Dr. Ajay Naik / Dr. Tejas V. Patel / Dr. Vipul Kapoor**
Duration	:	**1 Day**
Number of Seats	:	**50**
Venue	:	**CIMS Auditorium**

Programme Overview:

It is important to have a sound knowledge and correct interpretation of 12-lead ECG to help in diagnosis and management of medical patients. This necessiates that not only specialists, but also other healthcare professionals like General Practitioners, Interns, Post-graduate Students, Nurses and Paramedical Staff should have basic understanding of ECG for timely diagnosis.The Basic ECG course has been designed to provide understanding on basic concepts of 12-lead ECG which will be very useful in treating Ischemic and Rhythm Disorders of heart.

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

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

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

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

CIMS Hospital : Regd Office: Plot No.67/1, Opp. Panchamrut Bunglows, Nr. Shukan Mall, Off Science City Road, Sola, Ahmedabad - 380060.
Ph. : +91-79-2771 2771-72 Fax: +91-79-2771 2770.
CIMS Hospital Pvt. Ltd. | CIN : U85110GJ2001PTC039962 | info@cims.org | www.cims.org

Printed, Published and Edited by Dr. Keyur Parikh on behalf of the CIMS Hospital
Printed at Hari Om Printery, 15/1, Nagori Estate, Opp. E.S.I. Dispensary, Dudheshwar Road, Ahmedabad-380004.
Published from CIMS Hospital, Nr. Shukan Mall, Off Science City Road, Sola, Ahmedabad-380060.