### 32nd Annual International Conference on

## RECENT ADVANCES IN ECHOCARDIOGRAPHY AND ALLIED TECHNIQUES (MRI, CT SCAN, NUCLEAR)

FRIDAY, April 1, 2016

Hilton Chicago, Salon A-5, LL 720 S. Michigan Avenue Chicago, Illinois 60605 Phone: 1+(312) 922-4400

# INTERESTING CASE STUDIES OVER 75 CASES BY OVER 75 FACULTY ARE EXPECTED TO BE SHOWN

This event is not part of ACC.16, as planned by its Program Committee, and does not qualify for continuing medical education (CME), continuing nursing education (CNE) or continuing education (CE) credit.

CONFERENCE DIRECTOR: Navin C. Nanda, MD

Sponsored by the International Society of Cardiovascular Ultrasound (ISCU) in conjunction with the American Association of Cardiologists of Indian Origin (AACIO)



Hilton Chicago Salon A-5, LL 720 S. Michigan Avenue Chicago, Illinois 60605 Phone: 1+(312) 922-4400



#### **Symposium Location:**

Hilton Chicago 720 S. Michigan Avenue Chicago, Illinois 60605 Phone: 1+(312)-922-4400

**Purpose:** This conference is designed to provide a review of echocardiography and allied techniques (MRI, CT Scan, Nuclear) with emphasis on case studies dealing with various cardiac disease entities.

**Objective:** We expect the attendees to acquire and enhance their knowledge of the use of echocardiography, and other noninvasive techniques in the day-to-day clinical practice.

**Accreditation:** This event does not qualify for continuing medical education (CME), continuing nursing education (CNE) or continuing education (CE) credit. **The ISCU will provide a certificate of attendance.** The program is not intended to provide extensive training or certification in the field.

#### **ACKNOWLEDGEMENTS**

No commercial support has been provided for this.

#### **HOTEL INFORMATION**

The Conference <u>does not</u> have a block of rooms available. Rooms may be available through the ACC Housing as a registered attendee of ACC or through sites on the internet. However, participation in the Conference does not in any way influence room availability.

#### **CONFERENCE DIRECTOR:**

Navin C. Nanda, MD, DSc(Med)(Hon), DSc(Hon), FACC, FAHA, FISCU(D), Distinguished Professor of Medicine and Cardiovascular Disease, University of Alabama at Birmingham, Birmingham, Alabama.

#### FACULTY:

- Aiden Abidov, MD, PhD, Associate Professor of Medicine and Radiology, and Medical Director, The UAMC Cardiovascular Imaging, The Leonard C. Pfeiffer Chair of Cardiovascular Medicine, The University of Arizona College of Medicine, Tucson, Arizona
- Homaa Ahmad, MD, Section of Non-Invasive Imaging, Department of Cardiology, Ochsner Medical Clinic, New Orleans, Louisiana
- Masood Ahmad, MBBS, Edward D. & Sally M. Futch Professor of Cardiology and Director, Echocardiography Laboratory, UTMB, Galveston, Texas
- Aman M. Amanullah, MD, PhD, Section Chief, Noninvasive Cardiology, Albert Einstein Medical Center and Clinical Professor of Medicine, Jefferson Medical College of Thomas Jefferson University, Philadelphia, Pennsylvania
- Jayashri R. Aragam, MD, Director, Echocardiography Lab, Boston VA Health Care System, West Roxbury, Massachusetts and Harvard Medical School, Boston, Massachusetts
- Daniel Areco, MD, Director, Cardiology Department and Chest Pain Unit, Army Forces General Hospital, Montevideo, Uruguay
- Jose Carlos Armendariz Ferrari, MD, Director of Echocardiography, Hipolito Unanue Natonal Hospital, and President, Peruvian Society of Echocardiography, Lima, Peru
- Alberto C. Barón, Director of Medical Department, Clinica de Marly, Bogota, Colombia
- Rolf Baumann, MSC, Vice President, Clinical Products & Innovations, TomTec Imaging Systems GmbH, Munich, Germany

- Christian S. Breburda, MD, PhD, Clinical Professor of Medicine, University of Arizona Phoenix and Director Imaging and Noninvasive Cardiology, Phoenix, Arizona
- Sibel Catirli Enar, MD, Associate Professor of Cardiology, Turkiye Hospital/Memorial Hospital, Istanbul, Turkey
- Mohammed Andaleeb Chowdhury, MD, MRCP (UK), Cardiovascular Medicine Fellow, University of Toledo Medical Center, Toledo, Ohio
- Reema Chugh, MD, FACC, Consultant, Cardiology/Adult Congenital Heart Disease and Heart Disease in Pregnancy, Kaiser Foundation Hospitals, Panorama City (Los Angeles), California
- **Galal Eldin Nagib El-Kilany, MD**, Professor of Cardiology, Tanta University, Tanta, Egypt
- Nilda Espinola-Zavaleta, MD, PhD, Professor of Echocardiography, Instituto Nacional de Cardiologia Ignacio Chavez, Mexico City, Mexico
- **Lidiette Esquivel, MD**, Director, Cardiolab Echocardiography, San Jose, Costa Rica
- Lee J. Frazin, MD, Professor of Clinical Medicine, University of Illinois Hospital and Health Sciences System and Director, Echocardiography Laboratory, Jesse Brown VA Hospital, Chicago, Illinois
- Julius M. Gardin, MD, MBA, Past Chair, Department of Medicine, Hackensack University Medical Center, Hackensack, New Jersey and Professor of Medicine, Rutgers New Jersey Medical School, Rutgers, New Jersey
- Ashok Garg, MD, Senior Consultant of Medicine and Head Department of Preventive and Non Invasive Cardiology, Jaipur Heart Institute, Jaipur, India
- Robert P. Gatewood Jr., MD, Clinical Associate Professor, SUNY at Buffalo and Cardiologist, Buffalo Cardiology and Pulmonary Associates PC, Buffalo, New York
- Shuping Ge, MD, Associate Professor of Pediatrics, Drexel University College of Medicine Chief, Section of Cardiology, St. Christopher's Hospital for Children, and Acting Chair, Pediatric Cardiology, Deborah Heart and Lung Center, Philadelphia, Pennsylvania
- Ed Gill, MD, Professor of Medicine, Division of Cardiology, University of Washington School of Medicine and Director, Echocardiography, Harborview Medical Center, Seattle, Washington
- Mark H. Goldberger, MD, Assistant Clinical Professor of Medicine, Columbia University, College of Physicians & Surgeons, and Assistant Attending Physician, New York Presbyterian Hospital, New York, New York
- Aasha S. Gopal, MD, Director, Advanced Echocardiography, St. Francis Hospital, Roslyn, NY., USA
- John Gorcsan III, MD, Professor of Medicine and Director of Echocardiography, University of Pittsburgh, Pittsburgh, Pennsylvania
- Kishore J. Harjai, MD, MMM, Medical Director, Structural Heart Intervention, Geisinger Clinic (Northeast), Wilkes-Barre, Pennsylvania
- Brian D. Hoit, MD, Professor of Medicine and Physiology and Biophysics, Case Western Reserve University and Director of Echocardiography, University Hospitals Case Medical Center, Cleveland Ohio
- Krasimira Hristova, MD, PhD, Associate Professor of Cardiology, National Heart Hospital, Sofia, Bulgaria
- Rachel Hughes-Doichev, MD, Assistant Professor of Medicine, Temple University School of Medicine and Director of Echocardiography, McGinnis Cardiovascular Institute, Allegheny General Hospital, Pittsburgh, Pennsylvania
- Omer Iqbal, MD, Professor, Loyola University Health System, Maywood, Illinois
- Raj Janardhanan, MD, MRCP, Associate Professor of Medicine and Medical Imaging, Medical Director, Non-Invasive Cardiac Imaging, South Campus, Sarver Heart Center, Tucson, Arizona
- Leng Jiang, MD, Professor of Medicine, Tufts University School of Medicine, Boston, Massachusetts and Director of Noninvasive Cardiology, Baystate Medical Center, Springfield, Massachusetts
- Kanwal Kapur, MD, Sr. Consultant and Chief of Non invasive Cardiology; Indraprastha Apollo Hospital New Delhi, India

- Jaroslaw D. Kasprzak, MD, Professor of Medicine and Head, Chair and Department of Cardiology, Medical University of Lodz, Lodz, Poland
- Smadar Kort, MD, Professor of Medicine, Director, Cardiovascular Imaging and Director, Echocardiography, Stony Brook University Medicine, Stony Brook, New York
- Itzhak Kronzon, MD, Professor of Cardiology, Northwell Health-Lenox Hill Hospital, New York, New York
- Serdar Küçükoğlu, MD, Professor of Cardiology, Istanbul University Institute of Cardiology, Istanbul, Turkey
- Stamatios Lerakis, MD, Professor of Medicine (Cardiology) and Radiology, Emory University School of Medicine, Atlanta, Georgia
- **Abdullah Al Shafi Majumder, MD**, Professor of Cardiology and Ex-Director, National Institute of Cardiovascular Diseases, Dhaka, Bangladesh
- Poonam Malhotra, MD, Professor, Cardiac Anaesthesia, CNC, All India Institute of Medical Sciences, Delhi, India
- David Mehlman, MD, Associate Professor of Medicine, Northwestern University Feinberg School of Medicine and Northwestern Memorial Hospital, Chicago, Illinois
- Jagdish C. Mohan, MD, Past President of Indian Academy of Echocardiography. Director of Cardiac Sciences Fortis Hospital, Shalimar Bagh, Delhi, India
- Jayanta Mukherjee, MD, MSc, Advanced Imaging Cardiologist, Ohio Health Heart and Vascular Physicians, Columbus, Ohio
- Bernhard Mumm, MS, President, TomTec Imaging Systems, Munich, Germany
- Michele Nanna, MD, Associate Clinical Professor of Medicine, Albert Einstein College of Medicine, and Medical Director, Cardiac Care and Vascular Medicine, PLLC, Bronx, New York
- Hans Joachim Nesser, MD, Director, Department of Cardiology, Elisabethinen Hospital, Linz, Austria and Associate Professor of Medicine, Tufts University School of Medicine, Boston, Massachusetts
- Alexander Olivares-Reyes, MD, Guerrieri Heart and Vascular Institute, Salisbury, Maryland, Salisbury, Maryland
- Ahmad Omran, MD, Consultant Cardiologist and Section Head, Non-Invasive Cardiology Lab, King Abdulaziz Cardiac Center, Ministry of National Guard Health Affairs, Riyadh, Kingdom of Saudi Arabia
- Mehmet Ozkan, MD, Professor of Cardiology, University of Istanbul, Istanbul, Turkey
- Ramdas G. Pai, MD, FRCP (Edin), Professor of Medicine and Director of Cardiology Fellowship Program and Cardiac Imaging, University of California Riverside School of Medicine, Riverside, California

- Natesa G. Pandian, MD, Professor of Medicine and Director, Heart Valve Center, Tufts University Medical Center, Boston, Massachusetts
- Raja Babu Panwar, MD, Professor of Cardiology and Vice-Chancellor, Rajasthan University of Health Sciences, Jaipur (Rajasthan), India
- Maurizio Parato, MD, Professor of Cardiology, Politecnica delle Marche University, Ancona/Ascoli Piceno, Italy
- Arnold Pasia, MD, Section Head, Heart Station and Echocardiographic Laboratories, Southern Philippines Medical Center, Davao City, Philippines
- Nelson Pizzano, MD, Director, Echocardiography Service, INCC and Coordinator, Cardiovascular Program, Hospital Evangelico, Montevideo, Uruguay
- Hanumanth K. Reddy, MD, Clinical Professor of Medicine, St. Louis University Medical School, St. Louis, Missouri, and Medical Director, Poplar Bluff Regional Hospital, Poplar Bluff, Missouri
- Asad Ullah Roomi, MD, Cardiologist, Prince Sultan Cardiac Center, Military Hospital Riyad, Riyad, Kingdom of Saudia Arabia
- **Aleksandr Rovner, MD**, Assistant Professor of Medicine, Case Western Reserve University, Cleveland, Ohio
- (Col.) C.P. Roy, MD, DM (Cardiology), Professor of Cardiology, Director and Head, Department of Medical Education (Cardiology) and Senior Consultant Cardiologist, Max Superspecialty Hospital, Saket, New Delhi, India
- Debasish Roychoudhury, MD, Clinical Assistant Professor of Medicine, Weill Medical College of Cornell University, New York, New York
- Muhamed Saric, MD, PhD, Associate Professor of Medicine and Director of Echocardiography Lab, New York University Langone Medical Center, New York, New York
- Amiya Kumar Sarma, MBBS, MD, Physician and Cardiologist, Guwahati Refinery Hospital, Assam, India
- Sangeeta Shah, MD, Associate Professor Ochsner Clinical School University of Queensland. Director, Cardiovascular MRI. Co-Director Adulr Congenital Heart Disease, New Orleans
- Saurabh Sharma, MD, Cardiology Fellow, Albert Einstein Medical Center, Philadelphia, Pennsylvania
- Ravindra K. Sharma, MD, Chief Cardiac Surgeon, Santokba Durlabhji Memorial Hospital, Jaipur, India
- **Gyanendra Sharma, MD**, Professor of Medicine, Director, Adult Echocardiography Laboratory and Medical Director, Cardiovascular Outpatient Center, Division of Cardiology, Medical College of Georgia, Augusta, Georgia
- Savitri Shrivastava, MD, Director, Pediatric Cardiology, Escorts Heart Institute and Research Center, New Delhi, India



### PRE-REGISTRATION FOR: 32nd Annual International Conference on Recent Advances in Echocardiography, April 1, 2016

NOTE: The following information can be sent to Monika Kapoor by e-mail, iscuorg@gmail.com

Last name	First name	M.	Degree
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Street Address			
City	State	Zip code	Country
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Specialty	C	Office Phone	

E-mail

Fee Schedule - no fee; no CME credits are provided.

Pre-registration is requested by March 25, 2016. After March 25, 2016, registration will be taken at the door.

Registration may be sent by fax or email as follows: Fill out the registration form and e-mail the information on the registration form to Monika Kapoor, e-mail: iscuorg@yahoo.com. For further information: E-mail address: Dr. Navin C. Nanda, nanda@uab.edu for information. Mobile phone: 1 1+205 807 0731.

Chittur A. Sivaram, MD, David Ross Boyd Professor & Vice Chief of Cardiovascular Section, Director, Cardiovascular Fellowship Training, and Associate Dean for Continuing Professional Development, University of Oklahoma, Oklahoma City, Oklahoma

Ivan Sokol, MD, Consultant and Attending Cardiologist, Cardiology Division, Polyclinic AVIVA, Zagreb, Croatia

Vincent L. Sorrell, MD, Anthony N. DeMaria Professor of Medicine, Associate Chief, Division of Cardiovascular Medicine, Chair, Cardiovascular Imaging and Program Director, Adult Cardiovascular Fellowship Program and Advanced Cardiovascular Imaging Fellowship Program, University of Kentucky and the Jack and Linda Gill Heart Institute, Lexington, Kentucky

Fabiola Sozzi, MD, PhD, Consultant Cardiologist, Ospedale Maggiore Policlinico IRCCS, Milan, Italy

Tahir Tak, MD, PhD, Cardiovascular Disease, Mayo Clinic, Rochester, Minnesota

Anurag Tomar, MD, Professor of Pediatrics, NIMS Medical College and Director, NIMS University, Jaipur, India

Padmini Varadarajan, MD, Associate Professor of Medicine, Loma Linda University Medical Center, Loma Linda, California

Zvi Vered, MD, Professor of Cardiology and Director, Department of Cardiology, Assaf Harofeh Medical Center, Zerifin, Israel and Chair, Section on Cardiology, Sackler School of Medicine, Tel Aviv University, Tel Aviv, Israel

#### CASE STUDIES IN ECHOCARDIOGRAPHY Friday, March 1, 2016

7:30 – 8:00 am Registration, Continental Breakfast

7:55 – 8:00 am Welcome and Course Orientation -

Dr. Navin Nanda

Each faculty case presenter will be allotted 6 minutes to present 1 case. This will include pertinent clinical findings, echocardiograms and/or other noninvasive studies, questions for the audience and brief discussion.

8:00-10:00 am

Session I. Cardiomyopathy, Congenital Heart Disease, Masses, Myocardial Infarction, Percutaneous Devices, Tissue Doppler Imaging, Valvar Heart Disease, Velocity Vector Imaging, 3D Echo, Miscellaneous.

Case Presentations and Discussion – Cases 1-19

Moderators: Drs. Masood Ahmad, Galal Eidin Nagib El-Kilany, and Dr. Chittur A. Sivaram

Dr. Masood Ahmad (Interesting 3D echo case presentation); Dr. Daniel Areco (Interesting case study); Dr. Alberto Barón (Pulsatile structure seen in the right ventricle); Dr. Chittur A. Sivaram (Abnormal structure in left atrium in a patient with mitral regurgitation; Dr. Mohammed Andaleeb Chowdhury (Giant sinus of Valsalva aneurysm); Dr. Galal Eldin Nagib El-Kilany (Interesting case study); Dr. Ed Gill (VF arrest in a patient with sinus venosus ASD); Dr. Rachel Hughes-Doichev (Interesting case study); Dr. Raj Janardhanan (Major complications following mitral valve replacement: Successful interventions under echo guidance); Dr. Jaroslaw D. Kasprzak (Interesting case study); Dr. Jayanta Mukherjee (Interesting case study); Dr. Navin C. Nanda (Interesting case studies); Dr. Hans Joachim Nesser (Interesting case study); (Col.) C.P. Roy (Interesting case of "RV mass"); Dr. Gyanendra Sharma (Role of multimodality imaging); Dr. Saurabh Sharma (A tale of aortic stenosis); Dr. Tahir Tak (Interesting case study); Dr. Padmini Varadarajan (Interesting case study)

10:00-10:15

Refreshment break

10:15-11:30 am

Session II. Biventricular Pacing, Cardiomyopathy/Myocarditis, Coronary Artery Disease, CT/MRI, Echo Quantification, Embolism, LV Diastolic Function, Masses, Prosthetic Valves, Shunt Lesions, Valvar Heart Disease.

Case Presentations and Discussion, Cases 20-33

Moderators: Drs. Natesa G. Pandian, R.B. Panwar, Debasish Roychoudhury and Zvi Vered

Dr. Christian S. Breburda (4D strain optimization in CRT); Dr. Leng Jiang (Interesting case study); Dr. David Mehlman (Amplatzer meets the aorta); Dr. Michele Nanna (Interesting congenital heart disease in a young adult); Dr. Alexander Olivares-Reyes (A cardiomyopathy associated to congenital heart disease); Dr. Mehmet Ozkan (A case of obstructive heart valve thrombus. How to manage); Dr. Natesa G. Pandian (Echo in acutely ill); Dr. R.B. Panwar (RHD - still unconquered); Dr. Maurizio Parato (A strange complication of a bicuspid aortic valve); Dr. Aleksandr Rovner (An unusual presentation of an uncommon disease); Dr. Debasish Roychoudhury (Interesting case studies); Dr. Aniya Kumar Sarma (Non-compaction of LV presenting with atypical seizure in a young boy); Dr. Zvi Vered (Unusual case presentation)

11:30-1:00 pm

Session III. Aortic Pathologies, Cardiac Dyssynchrony, Congenital Heart Disease, Critical Care, Masses, Pericarditis, Stress Echo, Valvar Heart Disease, 3D Echo.

Case Presentations and Discussion, Cases 34-46

Moderators: Drs. Aiden Abidov, Krasimira Hristova, Abdullah Al Shafi Majumder and Hanumanth K. Reddy

Dr. Aiden Abidov (Abnormal gradients on the recently implanted bioprosthetic aortic valve complementary role of Cardiac CTA vs 3D Echo); Dr. Aman Amanullah (A tale of aortic stenosis); Dr. Jayashri Aragam (60 year old male with dyspnea); Dr. Jose Carlos Armendariz Ferrari (Unusual case of chest pain); Dr. Reema Chugh (Congenital heart disease in women); Dr. Mark H. Goldberger (Interesting case study); Dr. Aasha Gopal (Transapical mitral valve replacement); Dr. Krasimira Hristova (Double orifice mitral valve); Dr. Abdullah Al Shafi Majumder (Interesting case study); Bernhard Mumm (Strain Task Force update); Dr. Stamiatios Lerakis (Interesting case study); Dr. Ramdas G. Pai (Patient with aortic stenosis: What will you do?); Dr. Hanumanth K. Reddy (Atrial dilation and dysfunction in the elderly); Dr. Anurag Tomar (Spindle cell sarcoma in 11 year old child)

1:00 - 2:00 pm

Lunch on your own

2:00 – 3:30 pm

Session IV. Cardiomyopathy/Myocarditis, CT/MRI, Congenital Heart Disease, Endocarditis, Heart Failure, Post Intervention, Prosthetic Valves, Pulmonary Hypertension, RV Function, Strain and Strain Rate, Valve Repair and Surgery, 3D Echo.

Case Presentations and Discussion, Cases 47-62

Moderators: Drs. Nilda Espinola-Zavaleta, Lee J. Frazin, John Gorcsan III, Serdar Küçükoğlu and Muhamed Saric

Dr. Nilda Espinola-Zavaleta (Interesting case study); Dr. Lee J. Frazin (Interesting case study); Dr. Julius M. Gardin (Interesting case study); Dr. John Gorcsan III (Interesting case study); Dr. Kanwal Kapur (Papillary muscle rupture with fungal vegetations-3D TEE echo study. LV myxoma an unusual presentation); Dr. Serdar Küçükoğlu (A case with pulmonary hypertension); Dr. Jagdish C. Mohan (Spontaneous left atrial dissection and cerebral embolism); Dr. Arnold Pasia (A rare case of aortacameral fistula); Dr. Nelson Pizzano (Interesting case study); Dr. Asad Ullah Roomi (Interesting case studies); Dr. Muhamed Saric (It's not a tumor [but it's a Krukenberg]); Dr. Sangeeta Shah (Interesting case with multimodality); Dr. Ravindra K. Sharma (Case of hydatid cyst); Dr. Savitri Shrivastava (A rare case of congenital heart);)

3:30 – 5:00 pm

Session V. Cardiomyopathy/Myocarditis, Embolism, Endocarditis, Heart Failure, Masses, Pericardial Disease, Prosthetic Valves, Systemic Diseases, Trauma, Valvar Heart Disease, 3D Echo, Miscellaneous.

Case Presentation and Discussion, Cases 63-78

Moderators: Drs. Robert P. Gatewood, Jr., Shuping Ge, Poonam Malhotra and Vincent L.

Rolf Baumann (Automaton of measurements with machine learning); Dr. Sibel Catirli Enar (Interesting case study); Dr. Lidiette Esquivel (Interesting case study); Dr. Ashok Garg (Pulmonary valve involvement in Loeffler's endocarditis with reversal. Unique case); Dr. Robert P. Gatewood, Jr. (Interesting case study); Dr. Shuping Ge (Interesting case in fetal echocardiography); Dr. Brian Hoit (Interesting Case Study); Dr. Homaa Ahmad (Interesting Case Study); Dr. Kishore J. Harjai (Interesting case study); Dr. Omer Iqbal (Interesting case study focus on new oral anticoagluant drugs); Dr. Smadar Kort (Interesting case study); Dr. Itzhak Kronzon (Interesting case study); Dr. Poonam Malhotra (Interesting case study); Dr. Ahmad Omran (Interesting case study); Dr. Ivan Sokol (Interesting case study); Dr. Vincent L. Sorrell (Another one of a kind that I've seen before); Dr. Fabiola Sozzi (Multimodality approach to an interesting clinical case)

5:00 pm

Adjournment

All faculty with their spouses and guests are invited for a complimentary (NO CHARGE) Dinner (Indian cuisine) cum Cruise on Lake Michigan on Sunday, April 3, 2016 from 6.30 PM to 10 PM. Details are as follows:

Aboard the Anita Dee II (Anita Dee Yacht Charters) Docking Location: DuSable Harbor 200 N. Breakwater Access, Chicago, Illinois 60601 Docked on the south side of the Chicago River at Lake Shore Drive. The yacht will depart promptly at 7.15 PM. RSVP to Monika at iscuorg@yahoo.com. For any questions you may have contact Dr. Navin Nanda at nanda@uab.edu • Cell 205 807 0731

#### **FUTURE CONFERENCES/COURSES**

September 7-10, 2016, XXII World Congress of Echocardiography and Allied Techniques, Mexico City, Mexico. Organized by ISCU and the ABC Medical Center in Mexico City. President: Dr. Jose Antonio Arias Godinez; Secretary: Dr. Maria Eugenia Ruiz-Esparaza Dueñas

October 6-8, 2017, XXIII World Congress of Echocardiography and Allied Techniques, Jaipur, India. National President: Dr. Satish Parashar; Joint Organizing Secretaries: Dr. Sameer Shrivastava, Dr. Rakesh Gupta and Dr. S. Ramakrishnan