2011 SCMR/Euro CMR Joint Scientific Sessions

February 3 – 6, 2011
Nice Acropolis Convention Centre
Nice, France
### Thursday, February 3, 2011

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Dear colleagues and friends,

On behalf of the 2011 Program Committee, we would like to welcome you to Nice, France for the 2011 SCMR/Euro CMR Joint Scientific Sessions of the Society for Cardiovascular Magnetic Resonance and the Euro CMR Working Group on Cardiovascular Magnetic Resonance of the European Society of Cardiology.

We hope that the four days of the meeting will provide an exciting opportunity for you to explore new areas, catch up with the state of the art of CMR imaging, meet old friends and make new ones.

The program is structured around three main pathways: basic science/physics, pediatrics/congenital, and general CMR. For the first time, this year’s program also features a pre-conference for each of the three parallel tracks. In addition, the case review sessions that proved so popular at the last SCMR meeting, have become a full fourth track at this year’s joint meeting.

Another new feature of this meeting will be early morning sessions aiming to explain MR physics to non-physicists and cardiology concepts to non-cardiologists. We hope that these sessions will help bridge gaps in understanding between delegates from different academic and clinical backgrounds.

Thank you for joining us in Nice. Thank you to all presenters, organizers, sponsors and attendees. You make this conference happen! We hope and believe, that this meeting will be as exciting for you as it has been for us to prepare and organize.

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**Ex-officio: Jeanette Schulz-Menger,** MD, FESC, Charité Berlin und HELIOS Klinik, Berlin, Germany

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**Euro CMR EXAM in Hermes Auditorium**

**FEBRUARY 6, 2011/2.00 pm – 5.00 pm**

The exam is organized annually by the CMR WG of the ESC. After successfully completing the exam, candidates will receive a certificate stating they have taken and passed the exam. The exam can also be used towards future accreditation processes in CMR, but note that passing this exam alone does not constitute formal accreditation in CMR.

The exam consists of a theoretical part and a clinical case part. Both parts of the examination have to be passed to pass the examination. The exam lasts 3 hours in total.

The passing scores for each section are established after each exam based on statistical performance of individual questions and on the average level of scores at the respective exam. As a guide, the pass rate is usually around 60–65% of candidates.

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**SCIENTIFIC SESSION OBJECTIVES**

The scientific sessions are designed for clinical practitioners and trainees in cardiology, cardiothoracic surgery, and cardiovascular radiology, and basic scientists working in related fields.

**The goals of the Scientific Sessions are to**

- Deliver state of the art information on the science of CMR imaging and spectroscopy.
- Provide a forum for the presentation of new information on CMR.
- Compare and contrast CMR methods with other cardiovascular imaging approaches.

**At the conclusion of the Scientific Sessions, participants should be better able to:**

1. Discuss current and new applications where CMR helps in the diagnosis or management of adult cardiovascular disease.
2. Discuss issues how and when to perform CMR in pediatric subjects with cardiovascular and congenital heart disease.
3. Provide a framework for the regulatory and economic factors that influence clinical CMR.
5. Present and discuss contrast enhanced and non-contrast enhanced strategies of vascular MRI.
6. Present and discuss new approaches of molecular and interventional CMR.
7. Present emerging CMR techniques that may have novel clinical applications.
8. Explore current evidence that support CMR to be potentially cost-effective or provide improvement of patient care.
EBAC ACCREDITATION

The event “2011 SCMR/Euro CMR Joint Scientific Sessions” is accredited by the European Board for Accreditation in Cardiology (EBAC) for 24 hours of External CME credits.

Each participant should claim only those hours of credit that have actually been spent in the educational activity. EBAC works according to the quality standards of the European Accreditation Council for Continuing Medical Education (EACCME), which is an institution of the European Union of Medical Specialists (UEMS).

EACCME credits are recognized in Europe and North America. EACCME credits can be exchanged for their national equivalent by contacting the respective National CME authority. EACCME credits are recognized by the American Medical Association (AMA) towards the Physician’s Recognition Award (AMA). SCMR will assist its members in applying to the AMA for equivalent AMA PRA Category 1 credit(s)TM.

Participants will be awarded CME credits by EBAC for the attendance at Scientific Sessions from Thursday, February 3, 2011 to Sunday, February 6, 2011. Full congress days count for 6 credits, half congress days count for 3 credits.

TECHNOLOGIST WORKSHOP

As of publication application to ASRT has been submitted and approved credits are pending. Each technologist should claim only those hours of credit actually spent in this activity.

DISCLOSURE DECLARATIONS

All participating speakers and abstract authors are required to disclose to the program audience any financial relationships related to the subject matter of this program. A complete list of disclosures is available on pages 69 – 72.
GENERAL INFORMATION

VENUE
Nice Acropolis
Esplanade Kennedy, BP4083
06302 Nice, Cedex 4, France

ADMISSION
Conference name badges are required for admission to all activities related to the 2011 SCMR/Euro CMR Joint Scientific Sessions, including the exhibit hall and social events. Registered attendees have access to all sessions.

NAME BADGES
SCMR/Euro CMR Attendees red
SCMR/Euro CMR Attendees with Pre-Conference Course red with blue color bar
Faculty blue
Exhibitors green

REGISTRATION DESK AND HOURS
The Registration Desk is located at Agora 1 on level 1 of the Nice Acropolis. The Registration Desk will be open and staffed during the following hours:

Thurday, February 3, 2011 7:00 am – 6:00 pm
Friday, February 4, 2011 6:00 am – 6:00 pm
Saturday, February 5, 2011 6:30 am – 6:00 pm
Sunday, February 6, 2011 6:30 am – 2:00 pm

EBAC CME CERTIFICATE
Please hand in the EBAC evaluation form, enclosed in the conference bag, at the registration counter in order to receive the EBAC CME certificate. CME credits will be given for attendance at the SCMR/Euro CMR Joint Scientific Sessions from Thursday, February 3, 2011 to Sunday, February 6, 2011. Full congress days count for 6 credits, half congress days count for 3 credits.

EXHIBITS
Educational and informational exhibits will be available in Rhodes area on level 2 during the 2011 SCMR/Euro CMR Joint Scientific Sessions. Exhibiting company representatives will be available to answer your questions about their products and services. Please visit the exhibits; the complete list of exhibits can be found on pages 73 – 74. The opening hours of exhibits are as follows:

Friday, February 4, 2011 10:00 am – 8:00 pm
Saturday, February 5, 2011 10:30 am – 6:30 pm
Sunday, February 6, 2011 9:30 am – 1:30 pm

SPEAKER READY ROOM
The 2011 Program Committee is committed to providing attendees’ cutting edge technology and coordinated presentations at the 2011 SCMR/Euro CMR Joint Scientific Sessions. Speakers are asked to download their presentations no later than 90 minutes prior to start of their session. Due to time and technical reasons we kindly ask the speakers not to use their own notebook. Several PC work stations are provided in the Speaker Ready Room where speakers can also work on their presentations in a quiet area. Technical staff will be there to assist.

The Speaker Ready Room is located in the Hermes Lounge on level 2 of the Nice Acropolis and will be open the following days and times:

Thursday, February 3, 2011 7:00 am – 6:00 pm
Friday, February 4, 2011 6:00 am – 6:00 pm
Saturday, February 5, 2011 6:30 am – 6:00 pm
Sunday, February 6, 2011 6:30 am – 2:00 pm

ACKNOWLEDGEMENTS
The Society for Cardiovascular Magnetic Resonance and the ESC Working Group on Cardiovascular Magnetic Resonance gratefully acknowledge the support of these scientific sessions from the following industry supporters (as of January 15, 2011):

Siemens Healthcare
GE Healthcare
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Medis medical imaging systems bv

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SCMR/EuroCMR PRE-CONFERENCE COURSES

FEBRUARY 3, 2011

Physician Pre-conference Course
8.00 am – 6.00 pm Athena Auditorium

Moderators:
Patricia Bandettini, MD, National Institutes of Health
Steffen E. Petersen, MD, PhD, FESC, Barts and The London NIHR

8.00 am – 10.00 am
Basics of CMR

8.00 am
Basics: spins and hardware
Tobias Schaeffter, PhD, Kings College London
Learning Objectives*
> Understand the basic principles of MRI
> Know the purpose of hardware components of an MRI scanner
> Understand the influence of hardware components on the MRI image quality (e.g. field strength of main field, gradients)

8.20 am
Black-blood sequences
Anthony H. Aletras, PhD, University of Central Greece
Learning Objectives*
> Understand the basic MRI physics of black-blood pulse sequences
> Understand where and how to use black-blood pulse sequences in routine cardiac imaging
> Describe advantages and disadvantages of using black-blood pulse sequences

8.40 am
Bright-blood sequences
Robert M. Judd, PhD, Duke University
Learning Objectives*
> Understand why blood is bright in GRE pulse sequences
> Understand why blood is bright in SSFP sequences
> Understand why blood is bright in GRE and SSFP sequences after an MRI contrast agent has been administered

9.00 am
Let’s go faster: parallel acquisition techniques
Michael Hansen, PhD, National Institutes of Health
Learning Objectives*
> Understand the basic encoding principle employed in parallel imaging
> Describe the basic principles of parallel imaging reconstruction
> Understand the trade-offs between imaging speed, image quality, and signal to noise

9.20 am
Contrast material, NSF
Martin R. Prince, MD, PhD, FACP, Cornell University
Learning Objectives*
> Review safety of MRI contrast agents and the relative risks of allergic reactions and NSF
> Minimize risk of NSF and allergic reactions when using gadolinium
> Understand the latest data on NSF pathogenesis

9.40 am
Dealing with breathing artifacts and arrhythmia
Peter Kellman, PhD, National Institutes of Health
Learning Objectives*
> Understand image artifacts caused by respiratory motion and/or arrhythmias in various cardiac MRI protocols
> Understand the benefits and limitations of real-time cine imaging
> Understand the benefits and limitations of single shot accelerated imaging

10.00 am – 10.30 am Refreshment Break

10.30 am – 12.30 pm
How to sessions

10.30 am
How to measure regional and global ventricular function
Daniel B. Ennis, PhD, University of California
Learning Objectives*
> Understand how to acquire the standard cardiac views
> Quantify right and left global ventricular function
> Understand the value of quantifying regional cardiac function

10.50 am
How to quantify blood flow
Saul Myerson, MD, MRCP, John Radcliffe Hospital
Learning Objectives*
> Understand how flow is measured with CMR, including basic MR physics of flow
> Understand the optimal use of flow techniques, including how best to use in-plane and through-plane flow sequences, and their application to specific cardiac conditions
> Understand the potential errors and pitfalls in measuring flow

11.10 am
How to perform high-quality delayed enhancement imaging
Afshin Farzaneh-Far, MD, PhD, University of Illinois
Learning Objectives*
> Understand the basic principles of the segmented inversion recovery fast gradient echo pulse sequence commonly used for delayed enhancement imaging
> Know how to adjust the timing parameters and settings of the sequence for optimal imaging under different conditions
> Be aware of some common pitfalls and artifacts as well as how to overcome

* At the conclusion of this presentation, the attendee should be better able to
11.30 am
How to optimize MR angiography
J. Paul Finn, MD, UCLA
Learning Objectives*
> Understand the physical principals of MR angiography
> Prescribe imaging parameters for MR angiography
> Interpret MR angiography

11.50 am
How to assess the coronary arteries using CMR
Hajime Sakuma, MD, Mie University Hospital
Learning Objectives*
> Know acquisition methods and recent advances of coronary MR angiography
> Understand how to interpret coronary MR angiography
> Explain clinical indications and limitations of coronary MR angiography

12.10 pm
How to assess myocardial iron overload
Lisa Anderson, MD, St. George's Hospital
Learning Objectives*
> Basic understanding of the presentation, diagnosis and management of cardiac iron overload
> The importance of cardiac MRI assessment of iron
> How to measure cardiac iron overload by MRI

1.50 pm
CMR to assess the etiology of cardiomyopathy
Hassan Abdel-Aty, FESC, MD, MSc, Berlin Medical University
Learning Objectives*
> Appreciate the basic CMR imaging protocol and analysis tools in the setting of cardiomyopathy
> Appreciate the value of CMR to differentiate non-ischemic from ischemic cardiomyopathy and to be able to use CMR to further elucidate the etiology of the clinically frequent non-ischemic cardiomyopathies
> Appreciate the additional value of CMR compared to other methods used to assess non-ischemic cardiomyopathy stressing the ability of advanced tissue characterization, risk stratification and assessment of prognosis

2.10 pm
CMR in the assessment of possible arrhythmogenic right ventricular dysplasia
Harikrishna Tandri, MD, Johns Hopkins University School of Medicine
Learning Objectives*
> Understand the role of MR imaging in ARVD and the common MRI abnormalities of the right ventricle in ARVD
> Perform an MRI study using the right protocol for evaluation of ARVD
> Understand the role of quantitative MRI variables and delayed enhancement to diagnose ARVD

2.30 pm
CMR in suspected acute myocarditis
Ali Yilmaz, MD, Robert Bosch Krankenhaus Stuttgart
Learning Objectives*
> Understand the principles of state-of-the-art methods (invasive as well as non-invasive) for evaluation of suspected acute myocarditis
> Understand the strengths and limitations of CMR for evaluation of suspected acute myocarditis
> Better assess the diagnostic value of non-invasive CMR results in comparison to invasive EMB results in patients with suspected acute myocarditis

2.50 pm
CMR in myocardial ischemia
Theodoros Karamitsos, MD, PhD, University of Oxford
Learning Objectives*
> Understand the basic concepts of first-pass perfusion imaging with CMR
> Understand the basic concepts of dobutamine stress CMR
> Understand the strengths & limitations of CMR compared to other ischemia testing techniques (e.g. dobutamine stress echo, SPECT)

* At the conclusion of this presentation, the attendee should be better able to
### Physician Pre-conference Course (cont’d)

**Athena Auditorium**

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<td>3.10 pm</td>
<td><strong>CMR in myocardial viability</strong></td>
<td>Joseph Selvanayagam, MBBS, FRACP, Flinders Medical Centre</td>
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|              | Learning Objectives*                                                |                                   | > Understand the importance of assessing viability  
|              | > Techniques for CMR assessment                                     |                                   | > Evidence for benefit  
| 3.30 pm – 4.00 pm | **Refreshment Break**                                             |                                   |  
| 4.00 pm – 6.00 pm | **Clinical applications of CMR – Part 2**                          |                                   |  
| 4.00 pm      | **CMR in congenital heart disease**                                 | Vivek Muthurangu, MD, MRCPCH, UCL London |  
|              | Learning Objectives*                                                |                                   | > Understand role of CMR in congenital heart disease (CHD)  
|              | > Optimize CMR for CHD                                               |                                   | > Know about future directions  
| 4.20 pm      | **CMR in valvular disease**                                          | Federico Mordini, MD, Veterans Affairs Medical Center |  
|              | Learning Objectives*                                                |                                   | > Apply CMR imaging techniques in the assessment of stenotic valvular lesions  
|              | > Apply CMR imaging techniques in the assessment of regurgitant valvular lesions |                                   | > Explain the limitations of CMR and the relative strengths of other modalities in the assessment of valvular heart disease  
| 4.40 pm      | **CMR in pericardial disease**                                       | Amit R. Patel, MD, University of Chicago |  
|              | Learning Objectives*                                                |                                   | > Understand the clinical potential of CMR in the evaluation of pericardial diseases  
|              | > Understand CMR techniques that might be used in the evaluation of pericardial diseases |                                   | > Understand the spectrum of pericardial diseases that might be referred to CMR  
| 5.00 pm      | **CMR in the assessment of intracardiac mass**                      | Raad Mohiaddin, MD, PhD, FRCR, FRCP, FESC, Royal Brompton Hospital |  
|              | Learning Objectives*                                                |                                   | > Know the prevalence of cardiac masses and be familiar with pathological classification  
|              | > Know a comprehensive CMR protocol for assessing cardiac tumors |                                   | > Learn a systematic method of assessing the extend; implication and complications of cardiac tumors  
| 5.20 pm      | **Knowing when to choose CMR in a multimodality imaging climate**    | Marcus Y. Chen, MD, National Institutes of Health |  
|              | Learning Objectives*                                                |                                   | > Understand the strengths of and indications for CMR in the evaluation of common cardiovascular disease processes  
|              | > Appreciate the limitations and weakness of CMR in particular situations |                                   | > Understand how multiple imaging modalities may be complementary  
| 5.40 pm      | **Panel discussion of submitted questions**                         |                                   |  

*At the conclusion of this presentation, the attendee should be better able to...*
SCMR/EuroCMR PRE-CONFERENCE COURSES

FEBRUARY 3, 2011

Congenital Pre-conference Course
8.00 am – 6.00 pm Room Clio

Moderators:
Mark Fogel, MD, FACC, FAHA, FAAP,
Childrens Hospital of Philadelphia
Andrew M. Taylor, MD, UCL Institute of Child Health

8.00 am – 10.00 am
Basics

8.00 am
MR physics
John P. Ridgway, PhD, University of Leeds
Learning Objectives*
> Identify the key components of an MR system and understand the origin of the MR signal
> Understand how anatomical and functional MR images are formed of the beating heart, and the factors that affect soft tissue contrast and the appearance of flowing blood
> Understand the most commonly used nomenclature and the key parameters associated with the principal MR imaging techniques

8.45 am
Normal and congenital anatomy – anatomical description with imaging correlates
Michael Ashworth, MD, Great Ormond St. Hospital for Children
Learning Objectives*
> Identify the anatomical components of the normal heart
> Identify variations from normal in cardiac anatomy
> Identify the anatomical features of the commoner forms of structural congenital heart disease

9.30 am
Patient set-up
Wendy Norman, DCR(R), DRI, University College London
Learning Objectives*
> Check the patient for any contraindications to the cardiac MRI examination, carry out the procedure safely, and safety within the MRI department particularly in the case of cardiac arrest of the patient
> Explain thoroughly the procedure to a patient and then position them comfortably and correctly on the scanner.
> Understand how the effects of incorrect set up of the patient can affect quality of the examination

8.00 am – 6.00 pm Room Clio

10.30 am – 12.30 pm

Methods

10.30 am
MR and CT – which method to use
Aloha Meave, MD, Ciudad Universitaria Mexico
Learning Objectives*
> Understand the applications of computed tomography in congenital heart disease
> Understand the applications of magnetic resonance in congenital heart disease
> Be capable of applying both methods in a complementary way in complex congenital heart disease

11.00 am
3D MR imaging – MR angiography and b-SSFP
Lars Grosse-Wortmann, MD, Hospital for Sick Children
Learning Objectives*
> Understand the indications and limitations of MR angiography and 3D – bSSFP imaging in congenital heart disease
> Be familiar with the practical implications and “how to” aspects of MR angiography and 3D – bSSFP
> Know about the pitfalls of MR angiography and 3D – bSSFP imaging in congenital heart disease

11.30 am
Flow and function for CHD
Arno AW Roest, MD, PhD
Leiden University Medical Center
Learning Objectives*
> The advantages and drawbacks of the different methods used to assess blood flow in patients with congenital heart disease
> The advantages and drawbacks of using 2D and 3D velocity encoded MR for the assessment of valvular function and diastolic function
> How CMR can be used to assess cardiac dimensions and function

12.00 pm
Late gadolinium enhancement and myocardial perfusion in CHD
Matthew Harris, MD, The Children’s Hospital of Philadelphia
Learning Objectives*
> Understand the methodology and principles of applying myocardial perfusion imaging to children and adults with congenital heart disease
> Understand the methodology and principles of applying late gadolinium enhancement imaging to children and adults with congenital heart disease
> Identify which forms of congenital heart disease are appropriate for applying late gadolinium enhancement and myocardial perfusion magnetic resonance imaging

12.30 pm – 1.30 pm Lunch (on own)

* At the conclusion of this presentation, the attendee should be better able to
1.30 pm – 3.30 pm
Clinical applications – Part 1: initial diagnosis and follow-up of CHD

1.30 pm
Imaging shunts
Willem A. Helbing, MD, Erasmus MC-Sophia
Learning Objectives*
> Know the indications for assessment of shunts with cardiovascular MRI
> Know how to assess shunts in different types of congenital heart disease
> Know which techniques to apply in the assessment of shunt size

2.00 pm
Imaging aortic pathologies
Elie Mousseaux, MD, PhD, Hôpital Européen Georges Pompidou
Learning Objectives*
> Understand appropriate clinical role of MRI in congenital aortic diseases for diagnosis and follow up
> Estimate standard anatomy and velocity CMR measurements in case of aortic lesions of the aorta
> Understand potential contributions of MRI associated with pressure estimates to functional imaging of the thoracic aorta

2.30 pm
Coronary artery imaging in CHD
Gerald F. Greil, MD, King’s College, London
Learning Objectives*
> Know the indications for coronary artery imaging in CHD
> Know different techniques to image coronary arteries in CHD
> Understand the principles of an optimized 3D whole heart approach to image coronary arteries in CHD

3.00 pm
Imaging tetralogy of Fallot
Lucia J.M. Kroft, MD, PhD, Leiden University Medical Center
Learning Objectives*
> Select the appropriate MR imaging sequences in evaluating patients with TOF
> Choose appropriate image post processing techniques
> Identify major complications in patients with TOF

3.30 pm – 4.00 pm
Refreshment Break

4.00 pm – 6.00 pm
Clinical applications – Part 2: initial diagnosis and follow-up of CHD

4.00 pm
Imaging transposition of the great arteries
Matthias Gutberlet, MD, University Leipzig
Learning Objectives*
> Distinguish different types of transposition of the great arteries (TGA)
> Differentiate surgical techniques to correct TGA
> Image pre- and postoperative patients with TGA by MRI including volumetric and functional assessment of ventricular function and flow measurements

4.30 pm
Imaging HLHS, Glenn & Fontan
Andrew Powell, MD, Children’s Hospital Boston
Learning Objectives*
> Define the indications for CMR in HLHS, Glenn and Fontan circulations
> Understand an imaging protocol for patients with single ventricle heart disease
> Know the limitations of CMR in single ventricle heart disease

5.00 pm
Case presentations – Question and answer session with the panel
Mark Fogel, MD, FACC, FAHA, FAAP, Childrens Hospital of Philadelphia
Andrew M. Taylor, MD, UCL Institute of Child Health

* At the conclusion of this presentation, the attendee should be better able to
Basic Science Pre-conference Course:
“Innovations in Cardiac MR Pulse Sequences”
8.00 am – 6.00 pm Hermès Auditorium

This session is endorsed by the ISMRM

Moderators:
Michael Jerosch-Herold, PhD, Brigham and Women’s Hospital
Sebastian Kozerke, PhD, University and ETH Zurich
Michael Markl, PhD, University Hospital Freiburg

8.00 am
Introduction

8.10 am
CMR: What are the unresolved technical challenges?
Leon Axel, PhD, MD, NYU Langone Medical Center

Learning Objectives*
> Describe principal technical challenges of CMR
> Describe principal current approaches to meeting technical challenges of CMR
> Describe potential future approaches to meeting technical challenges of CMR

8.30 am – 10.00 am
Compressed Sensing and Accelerated MRI in CMR

8.30 am
Compressed sensing: Promise for CMR and current status
Michael Lustig, PhD, University California

Learning Objectives*
> Understand the basic theory of compressed sensing
> Understand the application of compressed sensing to CMR, benefits and pitfalls
> Know the current status of compressed sensing CMR

8.45 am
How fast does CMR get?
Sebastian Kozerke, PhD, University and ETH Zurich

Learning Objectives*
> Understand the difference between different CMR scan acceleration approaches
> Describe the fundamental limits to CMR scan acceleration
> Select the appropriate means of CMR scan acceleration depending on application

9.00 am
K-space trajectories and reconstruction algorithms
Craig H. Meyer, PhD, University Virginia

Learning Objectives*
> Understand the basic theory of compressed sensing
> Understand the application of compressed sensing to CMR, benefits and pitfalls
> Know the current status of compressed sensing CMR

9.15 am
Compressed sensing for myocardial perfusion imaging
Reza Nezafat, PhD, Harvard Medical School

Learning Objectives*
> Understand the potential of compressed-sensing in accelerating image acquisition for CMR
> Understand the utility of compressed-sensing beyond image acceleration
> Understand limitations and future needs

9.30 am
Real-time cine with accelerated CMR
Bob Hu, MD, Stanford University

Learning Objectives*
> Understand the clinical indications for real-time cardiovascular MR examination
> Select & perform relevant real-time examination of the cardiovascular system
> Discuss and interpret the pros and cons of real-time cardiovascular MR examination

10.00 am – 10.30 am Refreshment Break

10.30 am – 12.30 pm
Motion Correction and Self-gated Techniques

10.30 am
Motion correction methods
Matthias Stuber, PhD, CHUV University of Lausanne

Learning Objectives*
> Know standard techniques for motion suppression
> Are introduced into new self-gated techniques
> Understand current status of self-gating techniques

10.50 am
Hybrid MRI/US methods for motion correction
Matthias Günther, PhD, Mediri GmbH

Learning Objectives*
> Name potential problems when combining ultrasound imaging with MRI
> Appreciate the benefits of using ultrasound imaging within the MR-scanner
> Explain how real-time tracking can be performed on ultrasound images

11.20 am
CMR coronary imaging: what works best to correct motion
Himanshu Bhat, PhD, Siemens Medical Solutions USA Inc.

Learning Objectives*
> Identify various classes of motion correction techniques used in coronary MRA
> Identify the advantages and disadvantages of the various motion correction techniques
> Pick a motion correction technique based on specific requirements

* At the conclusion of this presentation, the attendee should be better able to...
SCMR/EuroCMR PRE-CONFERENCE COURSES
FEBRUARY 3, 2011

11.40 am
Motion correction by post-processing: reproducing Kernel Hilbert spaces and other approaches
Pierre-André Vuissoz, PhD, CHU de Nancy
Learning Objectives*
> Describe several limitations of breath hold cardiac MRI acquisitions
> Name at least one MRI reconstruction using motion correction methods on a free breathing cardiac MRI acquisition
> Describe that cardiac images at a given cardiac and respiratory phase can be reconstructed from free-breathing continuously acquired data by an appropriate interpolation method

12.10 pm
Self-gating: reading heart-beats in K-space
Robert Manka, MD, University Hospital Zurich
Learning Objectives*
> Understand the self-gating principle and its limitations
> Understand the clinical indications for self-gating
> Outline future applications of self-gating

12.30 pm – 1.30 pm  Lunch (on own)

1.30 pm – 2.30 pm
Quantifying cardiovascular flow and motion

1.30 pm
Time-resolved 3D vector flow velocity imaging: methods and applications
Michael Markl, PhD, University Hospital Freiburg
Learning Objectives*
> Understand the methods and principles of time-resolved 3D velocity encoded cardiovascular MR imaging
> Identify potential applications of flow-sensitive 4D MR imaging in the cardiac and vascular system
> Review the current state of the literature regarding successful applications of 3D velocity encoded MRI and understand its limitations and potential for the comprehensive evaluation of cardiovascular disease

1.45 pm
Myocardial phase-contrast velocity imaging: mind your VENC!
Bernd Jung, PhD, University Hospital Freiburg
Learning Objectives*
> Understand and perform myocardial phase-contrast velocity imaging
> Know how to evaluate the data provided by myocardial phase-contrast velocity imaging
> Know the strengths and weaknesses of myocardial phase-contrast velocity imaging

2.00 pm
Techniques for pulse wave velocity measurements
Christopher Hardy, PhD, GE Global Research
Learning Objectives*
> Describe the relationships among arterial pulse wave velocity, compliance, distensibility, and Young's modulus
> Compare and contrast the main MR pulse sequences/methods for determination of arterial pulse wave velocity
> Describe the link between abnormal aortic compliance and various disease states, and the effect of abnormal aortic compliance on heart function

2.15 am
Techniques for assessing diastolic function
JJM Westenberg, PhD, Leiden University Medical Center
Learning Objectives*
> Understand why trans-valvular flow assessment with MRI with retrospective valve tracking is more accurate than without
> How to obtain parameters describing diastolic function from transvalvular flow wave form analysis
> How to incorporate myocardial motion measurement in diastolic function assessment with MRI

2.30 pm – 3.30 pm
Novel myocardial perfusion techniques

2.30 pm
Arterial spin labeling
Krishna S. Nayak, PhD, University of Southern California
Learning Objectives*
> Explain how arterial spin labeling is applied to the measurement of myocardial blood flow
> Explain the advantages of myocardial ASL compared to existing perfusion imaging techniques
> List the current limitations of myocardial ASL approaches

2.50 pm
HYPR
Rohan Dharmakumar, PhD, Northwestern University

3.10 pm
Arterial input sampling and dual contrast techniques
Peter David Gatehouse, PhD, Royal Brompton Hospital
Learning Objectives*
> Understand the SNR vs non-linearity dilemma associated with T1-weighting in first-pass Gd-contrast agent myocardial perfusion
> Understand why quantification of myocardial perfusion (or reserve) requires different CMR parameters from visual assessment
> Describe three published solutions to the dilemma in objective 1

3.30 pm – 4.00 pm  Refreshment Break

* At the conclusion of this presentation, the attendee should be better able to
Basic Science Pre-conference Course (cont’d) | Hermes Auditorium

4.00 pm – 4.30 pm
Angiography and vessel wall imaging

4.00 pm
Non-contrast MRA techniques
Gerhard Laub, PhD, Siemens Healthcare USA

Learning Objectives*
> Understand the underlying physical principles of non-contrast MRA techniques
> Understand the strengths, weaknesses, and pitfalls of non-contrast MRA techniques in comparison to contrast-enhanced MRA
> Select optimization criteria for improving non-contrast MRA results

4.15 pm
Three dimensional vessel wall and plaque imaging
Yiu-Cho Chung, PhD, Shenzhen Institutes of Advanced Technology, Chinese Academy of Science

Learning Objectives*
> Know the importance of blood suppression in plaque and vessel wall imaging, and various methods this can be done in MRI
> Understand the motivation for three dimensional vessel wall imaging and the MRI methods available
> Know how three dimensional dark blood imaging techniques are used in wall imaging of various vessels

4.30 pm – 5.30 pm
Tissue characterization techniques

4.30 pm
Fat and water separated imaging in the heart: tissue characterization and artifact reduction
Peter Kellman, PhD, National Institutes of Health

Learning Objectives*
> Understand applications for fat and water separated imaging in cardiac MRI
> Understand the methodology of fat and water separated imaging using multi-echo Dixon-like approaches
> Understand the application of fat and water separated imaging to late enhancement and the benefit for artifact reduction

4.45 pm
Myocardial edema imaging techniques
Anthony H. Aletras, PhD, University of Central Greece

Learning Objectives*
> Understand the basic MRI physics of pulse sequences used for imaging edema
> Understand how to use the techniques in daily clinical scans
> Describe advantages and disadvantages of each technique

5.00 pm
Myocardial oxygenation imaging: new methods for ischemia detection
Jie Zheng, PhD, Washington University of School Medicine

Learning Objectives*
> Understand basic concept and mechanism for assessing myocardial oxygen content using CMR
> Learn various pulse sequences that generate image contrast for qualitative and quantitative measurements of myocardial oxygenation using CMR methods
> Have a broad knowledge on current status of clinical applications of myocardial oxygenation using CMR approaches

5.15 pm
BOLD techniques in the heart
Rohan Dharmakumar, PhD, Northwestern University

Learning Objectives*
> Understand the biophysical concepts behind myocardial BOLD imaging
> Explain the advantages and disadvantages of various oxygen-sensitive approaches in the myocardium
> Describe the state-of-the-art methods used in myocardial BOLD imaging with ties to high field imaging

5.30 pm – 6.00 pm
Closing remarks

Where do we go from here?
Roderic Pettigrew, MD, PhD, National Institutes of Health

* At the conclusion of this presentation, the attendee should be better able to
10th Annual Meeting of the Working Group on Cardiovascular Magnetic Resonance Imaging of the European Society of Cardiology

May 17 - 19, 2012
Vienna, Austria

For preliminary program and more information please see our website:

eurocmr2012.medconvent.at

Join the ESC Working Group on Cardiovascular Magnetic Resonance and become a member of the ESC

Membership is free and can be done in one click on our website:

www.escardio.org/eurocmr
CONCURRENT SESSIONS 7.00 am – 8.00 am

C G

Physics for Physicians 1
How an MRI Scan is Performed
7.00 am – 8.00 am  Athena Auditorium

7.00 am

MRI systems & spin physics
John P. Ridgway, MD, University of Leeds
Learning Objectives*
> Understand the key components of an MRI system and their purpose
> Understand the origin of the MR signal
> Understand relaxation mechanisms and the factors that relaxation times (T1 and T2) in different biological tissues and how this leads to the unique soft tissue contrast provided by MRI

7.30 am

Echoes and spatial localization
Martin John Graves, PhD, Cambridge University Hospitals Trust
Learning Objectives*
> Understand the formation of echoes in an MRI pulse sequence
> Understand the process of spatial localization in an MRI pulse sequence
> Understand the role of the Fourier transform in producing an MRI image

C G

Case Review Session: Cases from France – Focus on Artifacts and Variations of Normal
7.00 am – 8.00 am  Room Clio

Cases from France – pitfalls and variants of normal in the diagnosis of cardiomyopathies, IHD, masses and valve disease
Moderator:
Elie Mousseaux, MD, PhD, Hôpital Européen Georges Pompidou
Learning Objectives*
> Understand common artifacts and pitfalls in cine, perfusion and velocity-encoded CMR
> Avoid misinterpretation in CMR due to variation of normal anatomy or imaging artifact
> Manage some difficulties that can be found in CMR

Presenters:
Alban Redheuil, MD, PhD, Hôpital Européen Georges Pompidou
Pierre Croisille, MD, PhD, Hôpital Cardiovasculaire Louis Pradel
Philippe Germain, MD, Université de Strasbourg
Alexis Jacquier, MD, PhD, Hopital la Timone
Elie Mousseaux, MD, PhD, Hôpital Européen, Georges Pompidou

Welcome and Opening Plenary
8.00 am – 8.15 am  Athena Auditorium

Eike Nagel, MD, President of SCMR
Massimo Lombardi MD, Immediate Past Chair of the CMR Working Group of the ESC

B C G

Cardiology Concepts for Non-Cardiologists 1: Normal Physiology of the Cardiovascular Systems
7.00 am – 8.00 am  Room Thalie/Erato

Understanding how the heart works: Cardiac mechanics, deformation, load and contractility
Frank E. Rademakers, MD, PhD, University Hospitals Leuven
Learning Objectives*
> Understand the link between anatomy and function of the heart
> Define contractility
> Understand deformation and its relation with loading conditions

B C G

The Impact of CMR on Clinical Decision Making
8.15 am – 10.00 am  Athena Auditorium

Moderators:
Dudley Pennell, MD, FESC, FACC, FRCP, Royal Brompton Hospital
Sven Plein, MD, PhD, University of Leeds

8.15 am

The future role of cardiovascular imaging
J.J. Bax, MD, PhD, Leiden University Medical Center
Learning Objectives*
> Understand the different imaging modalities versus detection of CAD
> Understand the issue of ischemia versus coronary anatomy
> Understand the merits of invasive and non-invasive imaging of CAD
At the conclusion of this presentation, the attendee should be better able to:

**Cardiovascular imaging: why we need randomized trials**

Michael S. Lauer, MD, National Institutes of Health

**Learning Objectives**
- Appreciate the weaknesses of cardiovascular imaging studies that focus on diagnosis and prognosis
- Understand that prediction and risk stratification do not necessarily imply clinical value
- Describe different clinical trial designs that may be applicable to assessment of cardiovascular imaging

**Evidence based CMR: accuracy, outcome and comparative effectiveness**

Eike Nagel, MD, PhD, King's College London

**Learning Objectives**
- Describe the evidence to use CMR in clinical routine
- Describe ongoing major trials to deliver such evidence
- Describe knowledge gaps for clinical applications of CMR

**Late breaking results from the Euro CMR registry**

Heiko Mahrholdt, MD, Robert-Bosch-Krankenhaus Stuttgart

**Learning Objectives**
- Understand clinical use and impact on patient management of CMR in European multicenter clinical practice
- Describe the safety of the use of gadolinium in cardiovascular MR imaging (towards a potential FDA approval in the future)
- Describe preliminary follow-up results of the HCM and suspected CAD protocol

**Panel discussion**

10.30 am

Transcatheter valve implantation: where are we now and where are we going

Philipp Bonhoeffer, MD, Nationwide Children’s Hospital

**Learning Objectives**
- Understand the role of imaging in the design of new medical devices
- Understand the state of the art of transcatheter valve implantations in congenital heart disease
- Understand the impact of valve implantation on cardiac physiology

10.45 am

CMR to select patients for transcatheter valves

Sohrab Fratz, MD, PhD, German Heart Centre Munich

**Learning Objectives**
- Understand the role of CMR for selecting patients for transcatheter valves
- Understand benefits of CMR for selecting patients for transcatheter valves
- Understand the limitation of CMR for selecting patients for transcatheter valves

11.00 am

Multi-modality imaging to assess transcatheter valve implantation outcomes

Philipp C. Lurz, MD, University Leipzig

**Learning Objectives**
- Understand the consequences of chronic right ventricular pressure and/or volume overload due to right ventricular outflow tract dysfunction in patients with congenital heart disease
- Understand the potential of reversibility of chronic pathological right ventricular loading conditions after percutaneous pulmonary valve implantation in patients with congenital heart disease
- Choose the right imaging modality and technique for assessment of procedural success after percutaneous pulmonary valve implantation, with the aim to improve selection for transcatheter valve intervention and ultimately long-term

11.15 am

Use of imaging data to model the heart and valves

Tommaso Mansi, PhD, INRIA Sophia-Antipolis

**Learning Objectives**
- Grasp the motivations behind computational modeling of the heart and valves, and the clinical perspectives that may result
- Understand the underlying principles of computational models of cardiac electro-mechanics and valves personalized from MRI
- Personalized models in practice: in-silico pulmonary valve replacement in patients with corrected tetralogy of Fallot for model-based therapy planning and patient management

*At the conclusion of this presentation, the attendee should be better able to...*
11.30 am
Transapical aortic valve replacement using real-time MRI guidance
Keith A. Horvath, MD, National Institutes of Health
Learning Objectives*
> Understand the impact imaging has on the success of transapical aortic valve replacements
> Identify the limitations the various imaging modalities have regarding procedure guidance
> Understand the advantages of device composition and construction in facilitating transapical aortic valve replacements

11.45 am
Panel discussion

G

Oral Abstract Session 1
Early Career Award – Clinical

10.30 am – 12.00 pm
Room Thalie/Erato

Moderators:
Sven Plein, MD, PhD, University of Leeds
Eike Nagel, MD, King’s College London

10.35 am
Time-dependency, predictors and impact on outcome of infarct transmurality assessed by magnetic resonance imaging in patients with st-elevation myocardial infarction reperfused by primary percutaneous intervention
Suzanne de Waha, MD, University of Leipzig – Heart Center

10.47 am
Combined stress myocardial perfusion and late gadolinium enhancement imaging by cardiac magnetic resonance provides robust prognostic information to cardiac events
Otavio Coelho-Filho, MD, Brigham and Women’s Hospital

11.09 am
Magnetic resonance imaging assessment of myocardial inflammation in 132 unselected, consecutive patients with clinical suspicion of acute or chronic myocarditis - are we as good as we thought?
Philipp Lurz, MD, University of Leipzig – Heart Center

11.11 am
Derivation and validation of a prognostic prediction rule from clinical and stress CMR data characterizes cardiac prognostication in patients with suspected myocardial ischemia
Otavio Coelho-Filho, MD, Brigham and Women’s Hospital

11.23 am
Relation of microvascular dysfunction to exercise capacity and symptoms in patients with severe aortic stenosis
Christopher D. Steadman, MB ChB, University of Leicester

11.35 am
Strain-encoded cardiac magnetic resonance during high-dose dobutamine stress testing for the estimation of cardiac outcomes. Comparison to clinical parameters and conventional wall motion readings
Gitsios Gitsioudis, Sr, MD, University Clinic of Heidelberg

11.47 am
Infarct tissue heterogeneity by contrast-enhanced MRI is a novel predictor of mortality in patients with coronary artery disease with reduced left ventricular systolic function
Eri Watanabe, MD, PhD, Brigham and Women’s Hospital
10.47 am
Determination of the myocardial area at risk after reperfused acute myocardial infarction with different imaging techniques: cardiac magnetic resonance imaging, multidetector computed tomography and histopathological validation
Pierre Croisille, MD, PhD, Hôpital Cardiovasculaire Louis Pradel

10.59 am
A comparison of single-channel and multi-channel RF transmit coil for SSFP cine imaging at 3 Tesla
Shazia Hussain, MD, NIHR Biomedical Research Centre-King’s College London

11.11 am
Reproducibility of coronary vessel wall imaging techniques
Andrew D. Scott, MSc, Imperial College London

11.23 am
Image quality and diagnostic accuracy of inline motion-corrected (moco) first-pass stress myocardial perfusion images
Sujata M. Shanbhag, MD, National Institutes of Health

11.37 am
High field MR carotid vessel wall imaging: reproducibility of five different MR-weightings
Eleanore S. Kroner, MD, Leiden University Medical Center

11.47 am
Adiabatic T2-preparation modules optimized for robustness toward cardiac motion and flow – a comparison with existing techniques at 3 Tesla
Wolfgang G. Rehwald, PhD, Siemens Healthcare and Duke University

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**SCMR Business Meeting** (Members only)
12.00 pm – 12.30 pm  Athena Auditorium

12.30 pm – 1.30 pm  Lunch (on own)

Exhibits
Poster Viewing – not accredited for CME
(Authors not present)

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**CONCURRENT SESSIONS**  1.30 pm – 3.00 pm

**G**
Lecture Session:
**CMR in Non-Ischemic Heart Disease**

1.30 pm – 3.00 pm  Athena Auditorium
Moderators:
Karen Ordovas, MD, University of California, San Francisco
James Moon, MD, The Heart Hospital London

1.30 pm
Cardiomyopathies – issues to be solved by imaging
Stefan Neubauer, MD, John Radcliffe Hospital
Learning Objectives*
> Understand what CMR contributes to diagnosis of cardiomyopathies
> Understand what CMR can currently not answer regarding the diagnosis of cardiomyopathies
> Understand the prospects and opportunities for overcoming the current imaging limitations

1.45 pm
Technical developments for early detection of myocardial injury: which method is best?
Anthony H. Aletras, PhD, University of Central Greece
Learning Objectives*
> Understand the basic MRI physics of pulse sequences used for early detection of myocardial injury
> Understand how each pulse sequence addresses a different type of injury
> Describe advantages and disadvantages of each technique

2.00 pm
Optimizing delayed enhancement imaging in storage and deposit disease
Udo Sechtem, MD, Robert Bosch Krankenhaus
Learning Objectives*
> Identify patients in whom CE-CMR might be diagnostically useful
> Identify CE patterns specific storage diseases
> Care for patients with cardiomyopathies

2.15 pm
Myocardial inflammation – is CMR ready to guide patient management?
Jeanette Schulz-Menger, MD, FESC, Franz-Volhard-Klinik, Charité
Learning Objectives*
> Explain the different features of myocardial inflammation
> Explain the capabilities of non-invasive imaging
> Apply the CMR-protocol
> Know the details of interpretation
> Use CMR in this setting

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* At the conclusion of this presentation, the attendee should be better able to
2.30 pm
T2* – challenge or routine application worldwide –
towards high and ultrahigh field
Thoralf Niendorf, PhD, Max-Delbrueck-Center for Molecular Medicine
Learning Objectives*
> Understand the role of T2* imaging/mapping in clinical CMR
> Gain an insight into the basics and physics of T2*
  mapping/imaging
> Explore emerging T2* imaging/mapping technology and
  its implications for future clinical CMR applications
> Discuss solved problems and unmet needs of T2*
  imaging at high and ultrahigh field strengths

2.45 pm
Panel discussion

2.23 pm
Optimal assessment of right ventricular function using
cardiac magnetic resonance cine imaging after Mustard
palliation for transposition of the great arteries
Laura Jimenez-Juan, MD, Toronto General Hospital

2.35 pm
A T2* MRI prospective survey on heart iron in thalassemia
major patients treated with deferasirox versus deferiprone
and desferrioxamine in monotherapy
Alessia Pepe, MD, PhD, “G. Monasterio” Foundation and
Institute of Clinical Physiology

2.30 pm
Oral Abstract Session 3: Congenital
New Frontiers in Therapy or Patient Prognostication
1.30 pm – 3.00 pm
Room Thalie/Erato
Moderators:
Tal Geva, MD, Children’s Hospital Boston
Andrew M. Taylor, MD, UCL, Institute of Child Health

1.35 pm
Worldwide survey of T2* cardiovascular magnetic
resonance in thalassaemia
John-Paul Carpenter, MBBS BSc, Royal Brompton and
Harefield NHS Trust

1.47 pm
The evaluation of right and left ventricular morphology
by CMR with comparison to recipient heart after heart
transplant: a surgical perspective
Nicholas Farber, MD, Allegheny General Hospital

1.59 pm
Presence of mechanical dyssynchrony in Duchenne
Muscular Dystrophy: A cardiac MRI study utilizing
cross correlation delay
Kan N. Hor, MD, Cincinnati Children’s Hospital Medical
Center

2.11 pm
Prospective comparison on cardiac iron by MR in
thalassemia major patients treated with combination
deferipron-desferrioxamine versus deferipron and
desferrioxamine in monotherapy
Alessia Pepe, MD, PhD, “G. Monasterio” Foundation and
Institute of Clinical Physiology

1.30 pm – 3.00 pm
Oral Abstract Session 4:
Early Career Award – Basic Science
Hermes Auditorium
Moderators:
Frederick H. Epstein, PhD, University of Virginia Schools
of Medicine and Engineering
Debiao Li, PhD, Sinai Medical Center, UCLA

1.35 pm
An area-based imaging biomarker for characterizing
coronary artery stenosis with myocardial BOLD MRI
Sotirios A. Tsaftaris, PhD, Northwestern University

1.47 pm
Molecular MRI of acute necrosis with a novel DNA-
binding gadolinium chelate: kinetics of cell death
and clearance in infarcted myocardium
Shuning Huang, PhD, Massachusetts General Hospital
### Validation of blood flow partitioning in 4D phase contrast CMR measurements using Lagrangian coherent structures

**Johannes Töger, MSc, Skåne University Hospital, Lund University**

**2.11 pm**

**Virtual dye angiography: flow visualization for MRI-guided interventions using endogenous contrast**

**Ashvin K. George, PhD, National Institutes of Health**

**2.23 pm**

**Isotropic non-contrast whole-heart lumen only coronary MRA using local re-inversion and 2D-SENSE at 3 Tesla**

**Harsh K. Agarwal, PhD, Johns Hopkins University**

**2.35 pm**

**CMR tagging in the polar coordinate system**

**Abbas N. Moghaddam, PhD, University of California, Los Angeles**

**2.47 pm**

**Serial diffusion tensor MRI and tractography of the mouse heart in vivo: impact of ischemia on myocardial microstructure**

**Shuning Huang, PhD, Massachusetts General Hospital**

### Refreshment Break

**3.00 pm – 3.30 pm**

**Exhibits**

**Poster Viewing – not accredited for CME**

(Authors not present)

### Concurrent Sessions 3.30 pm – 5.00 pm

**C Lecture Session:**

**Cutting Edge CMR in Children**

**3.30 pm – 5.00 pm**

**Athena Auditorium**

**Moderator:**

**Albert de Roos, MD, Leiden University Medical Center**

**3.30 pm**

**Real time phase encoded velocity mapping**

**Michael S. Hansen, PhD, National Institutes of Health**

**Learning Objectives**

- Identify the needs for real-time velocity mapping
- Understand the key principles used in accelerating velocity mapping
- Understand some of the artifacts that are associated with the compromised in real-time velocity mapping

### Functional vascular imaging in children

**Vivek Muthurangu, MD, MRCPCH, UCL London**

**Learning Objectives**

- Understand new techniques for assessing vascular function
- Know which patient groups to perform them in
- Understand future MR directions

### Exercise CMR in CHD

**Kevin K. Whitehead, MD, PhD, Children’s Hospital of Philadelphia**

**Learning Objectives**

- Understand the benefits of exercise CMR in the management of patients with congenital heart disease
- Know the different strategies for implementing exercise CMR and their various advantages and limitations
- Gain insight into the use of CMR to study exercise physiology in patients with congenital heart disease

### Virtual surgery

**Gerald F. Greil, MD, King’s College London**

**Learning Objectives**

- Understand different image postprocessing techniques
- Know what the technical background of virtual surgery is
- Understand how virtual surgery could be applied in the future

### 4D flow applications

**Michael D. Hope, MD, UCSF**

**Learning Objectives**

- Discuss the basics of the MR technique used for 4D flow imaging
- Discuss 4D visualization technique and calculation of secondary vascular parameters
- Discuss emerging clinical applications for 4D flow imaging

### CMR guidance for device implantation and imaging of patients with pacemakers in CHD

**Michael D. Puchalski, MD, University of Utah**

**Learning Objectives**

- Know situations in which an MRI can be performed in a patient with a pacemaker
- Understand what precautions need to be taken to perform an MRI in a patient with a pacemaker
- Understand the utility of MRI guidance for interventional procedures and device placement
### Oral Abstract Session 5: Clinical Role of CMR Against Other Modalities

**3.30 pm – 5.00 pm**

**Room Thalie/Erato**

**Moderators:**
- Richard Coulden, University of Alberta Hospitals
- Edward T. Martin, MD, Oklahoma Heart Institute

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
<th>Institution</th>
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<tbody>
<tr>
<td>3.35 pm</td>
<td>Detection of triple vessel coronary artery disease by visual and quantitative first pass CMR myocardial perfusion imaging in the CE-MARC study</td>
<td>Neil Maredia, MB ChB, University of Leeds</td>
<td></td>
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<tr>
<td>3.47 pm</td>
<td>Evaluation of aortic valve stenosis from phase-contrast magnetic resonance data using a new automated segmentation and analysis method: comparison against Doppler Echocardiography</td>
<td>Carine Defrance, MD, Hopital Européen Georges Pompidou</td>
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<tr>
<td>3.59 pm</td>
<td>Myocardium at risk in ST-elevation myocardial infarction: comparison of T2-weighted edema imaging with the endocardial surface area assessed by magnetic resonance and validation against angiographic scoring</td>
<td>Georg F. Fuernau, MD, University of Leipzig – HeartCenter</td>
<td></td>
</tr>
<tr>
<td>4.11 pm</td>
<td>Impact of cardiovascular magnetic resonance assessment of ejection fraction on eligibility for implantable cardioverter defibrillators</td>
<td>Subodh B. Joshi, MBBS, MPH, St Michael’s Hospital</td>
<td></td>
</tr>
<tr>
<td>4.23 pm</td>
<td>CMR real-time, free-breathing, phase contrast flow quantification: a novel approach to assess ventricular coupling in constrictive pericarditis</td>
<td>Paaladinesh Thavendiranathan, MD, MSc, The Ohio State University</td>
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<tr>
<td>4.35 pm</td>
<td>Non-invasive estimation of increased LV filling pressures in LV hypertrophy with normal systolic function: comparison between CMR and Doppler, validated by invasive PCWP measurements</td>
<td>Bernard P. Paelinck, MD, PhD, University Hospital Antwerp</td>
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</tr>
<tr>
<td>4.47 pm</td>
<td>CMR in the diagnosis of acute pericarditis</td>
<td>Nicholas J. Brett, MBBS, B.Med. Sci., The Prince Charles Hospital</td>
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### Case Review Session: Cases from Asia – Focus on coronary MRA

**3.30 pm – 5.00 pm**

**Room Clio**

**Optimizing protocols in coronary MRA**

**Moderator:**
- Hajime Sakuma, MD, Mie University Hospital

**Learning Objectives***
- Learn the method to obtain MR images of the coronary arteries
- Know how to optimize acquisition of coronary MR angiography
- Understand clinical indications of coronary MR angiography

### Lecture Session: CMR Assessment of Cardiac Metabolism

**3.30 pm – 5.00 pm**

**Hermes Auditorium**

**Cardiac metabolic alterations in diabetes and ischemia/reperfusion: what we need to know**

**Speaker:**
- Kim Connelly, PhD, Keenan Research Centre of the Li Ka Shing Knowledge Institute of St. Michael’s, Sunnybrook Health Sciences Centre

**Learning Objectives***
- Identify the key cardiac metabolic alterations in diabetes
- Identify the key metabolic alterations in ischemia/reperfusion injury
- Understand the role of normal/abnormal metabolism in health and disease

**Methods for rapid imaging of DNP compounds in the heart**

**Speaker:**
- Charles H. Cunningham, PhD, Sunnybrook Health Sciences Centre

**Learning Objectives***
- Connect the physical and biological properties of 13C-labeled pyruvate with the data acquisition strategies required in cardiac metabolic studies
- Understand how a hyperpolarized 13C cardiac study is performed
- Describe the methods for imaging an array of clinically interesting intramyocardial enzyme reactions, and the associated challenges
4.00 pm
Hyperpolarized 13C-acetate to assess ischemia-reperfusion in the rat model
Arnaud Comment, PhD, École Polytechnique Fédérale de Lausanne

Learning Objectives*
> Understand the challenges and opportunities of hyperpolarized magnetic resonance
> Implement a hyperpolarized magnetic resonance experimental setup
> Evaluate the potential of hyperpolarized 13C-acetate for metabolic studies

4.15 pm
Assessment of cardiac metabolism in heart failure using hyperpolarized 13C-pyruvate
Damian Tyler, PhD, University Oxford

Learning Objectives*
> Understand the principles of hyperpolarized magnetic resonance spectroscopy
> Understand the use of hyperpolarized magnetic resonance spectroscopy in assessing cardiac metabolism
> Understand the impact of heart failure on cardiac metabolism

4.30 pm
Triglyceride metabolism and cardiac function
E. Douglas Lewandowski, PhD, UIC College of Medicine

Learning Objectives*
> Understand the direct and indirect influences of cardiac lipid metabolism on contractile function in normal and diseased hearts
> Understand and implement strategies for combined assessments of cardiac function and fatty acid metabolism
> Implement experimental schemes for stable isotope kinetics in the evaluation of metabolic flux rates and lipid dynamics in the intact heart

4.45 pm
Panel discussion

CONCURRENT SESSIONS 5.00 pm – 6.30 pm

LECTURE SESSION: CMR in Clinical Practice:
Coronary and Vascular CMR

5.00 pm
Coronary MRA: current and emerging techniques
Matthias Stuber, PhD, CHUV University of Lausanne

Learning Objectives*
> Know the correct state of the art
> Discuss advantages of coronary MRI
> Start with coronary MRA him/herself

5.0 pm
Applied MRA: thoracic aorta & pulmonary arteries
Scott K. Nagle, MD, PhD, University of Wisconsin

Learning Objectives*
> Understand the tradeoffs between spatial and temporal resolution and some typical scenarios when one or the other may be more important
> Understand how K-space acquisition order and contrast dynamics affect image quality
> Identify and explain some common artifacts seen in MRA of the aorta and pulmonary arteries

5.30 pm
Vessel wall CMR: state of the art and technical challenges
Tobias Saam, MD, University Hospital Munich

Learning Objectives*
> Understand when and how vessel wall MRI can be used in clinical routine
> Diagnose the most common cervical and cranial arteriopathies using vessel wall MRI
> Apply vessel wall MRI at his/her own facility

5.45 pm
4D flow imaging
Tino Ebbers, PhD, Linkoeping University

Learning Objectives*
> Identify different approaches for visualization and quantification of time-resolved three-dimensional (4D) blood flow
> Understand how time-resolved three-dimensional, three-directional phase-contrast MRI measurements are performed
> Understand the advantages and limitations of time-resolved three-dimensional, three-directional phase-contrast MRI

* At the conclusion of this presentation, the attendee should be better able to
6.00 pm
Atherosclerotic plaque imaging
Chun Yuan, PhD, University of Washington
Learning Objectives*
> Understand the need for atherosclerotic plaque imaging
> Identify key technical needs and abilities of plaque imaging
> Understand key features of plaque imaging

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5.00 pm – 6.30 pm
Room Thalie/Erato

Moderators:
Marco Gotte, MD, PhD, VUMC
Andrew E. Arai, MD, NHLBI – National Institutes of Health

5.05 pm
Contrast enhanced CMR in acute myocarditis: what is the optimal moment for imaging?
Alexis Jacquier, MD, PhD, Hôpital la Timone

5.17 pm
Left ventricular remodeling and hypertrophy in patients with aortic stenosis: insights from cardiac magnetic resonance imaging
Marc R. Dweck, MD, Royal Brompton Hospital

5.29 pm
Safety of adenosine stress perfusion cardiac magnetic resonance imaging in patients with aortic stenosis
Stephen Darty, BS, RT-N, MR, Duke Cardiovascular Magnetic Resonance Center

5.41 pm
Beyond late gadolinium enhancement: the key role of diffuse myocardial fibrosis in severe aortic stenosis – an equilibrium contrast CMR study
Andrew S. Flett, MBBS, The Heart Hospital

5.53 pm
A new typical finding in late gadolinium enhanced images for the diagnosis of endomyocardial fibrosis – the double V sign
Adriano C. Carneiro, MD, Heart Institute -InCor- University of Sao Paulo Medical School

6.05 pm
Gender differences in left ventricular geometry and determinants of myocardial perfusion reserve in patients with severe aortic stenosis
Christopher D. Steadman, MB ChB, University of Leicester

6.17 pm
Pathological CMR findings and their clinical value in patients with high grade ventricular arrhythmias without previously known cardiac conditions
Daniel Thomas, MD, PhD, University of Bonn

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5.00 pm – 6.30 pm
Room Clio

Best cases from the SCMR website competition
Moderators:
Chiara Bucciarelli-Ducci, MD, PhD, Bristol Heart Institute
Victor A. Ferrari, MD, University of Pennsylvania

Learning Objectives*
> Interpret clinical cases
> Understand strength and weaknesses of multimodality imaging
> Critically discuss clinical cases

Presenters:
Daniel Sado, Heart Hospital, London, UK
Jeanette Schulz-Menger, MD, FESC, Charité Berlin und HELIOS Klinik
Gary Cooper, University of Florida, Gainesville, USA
Patrizia Pedrotti, MD, Ospedale Niguarda Ca’ Granda Milan, Italy
Vikas K. Rathi, MD, FACC, Bon Secours Richmond Healthcare System, USA
### Oral Abstract Session 7:

**Novel Concepts or Techniques**

**5.00 pm – 6.30 pm**

**Hermes Auditorium**

**Moderators:**
Daniel Ennis, PhD, University of California  
Frank E. Rademakers, MD, PhD, University Hospitals Leuven

**5.05 pm**

043 Dynamic simulation of first pass myocardial perfusion MR with a novel perfusion phantom  
Amedeo Chiribiri, MD, King’s College London

**5.17 pm**

044 Classification of myofibers using statistics of the helix angle: a novel approach to characterize the structure of the human heart  
Choukri Mekkaoui, PhD, Harvard Medical School

**5.29 pm**

045 Feasibility of ultrahigh field (7 Tesla) human cardiovascular magnetic resonance imaging to assess cardiac volumes and mass validated against 1.5T and 3T field strengths  
Joseph J. Suttie, MBBS FRACP, University of Oxford

**5.41 pm**

046 Cardiac diffusion-weighted MR imaging in recent, subacute and chronic myocardial infarction: a pilot study  
Jean-Pierre Laissy, Senior, MD, PhD, Bichat University Hospital APHP

**5.53 pm**

047 MRI detects coronary vessel wall thickening with age in healthy subjects  
Andrew D. Scott, MSc, Imperial College London

**6.05 pm**

048 A novel, automated method for measuring mitral valve annular velocity from standard cine TrueFISP data – a feasibility study  
Peter J. Weale, BA,DCR(R), Siemens Healthcare USA

**6.17 pm**

049 Experimental myocarditis in rat can be detected and monitored by cardiac magnetic resonance imaging performed on a clinical 3.0T scanner  
Shunit Rinkevich-Shop, MSc, Tel Aviv University

**6.30 pm – 8.00 pm**

**Wine and Cheese Reception**

**Rhodes Exhibition Area**

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### Moderated Poster Session 1

**Novel Concepts, Techniques or Applications**

**6.30 pm – 7.30 pm**

**Rhodes Area**

**M1**

Non-invasive visualization of the complete cardiac conduction system using magnetic resonance microscopy  
Min-Sig Hwang, PhD, McKnight Brain Institute, University of Florida

**M2**

Detection of 3D cardiac metabolism after injection of hyperpolarized [1-13C] pyruvate  
Francesca Frijia, MSc, Fondazione G.Monasterio CNR

**M3**

Quantifying right ventricular motion and strain using 3D cine DENSE MRI  
Daniel A. Auger, Biomedical and Electrical Engineering, University of Cape Town

**M4**

Acute alcohol-induced myocardial inflammation as visualized by cardiac magnetic resonance  
Anja Zagrosek, MD, HELIOS Klinikum Berlin-Buch

**M5**

Description of A/C gene mutation related dilated cardiomyopathy with gadolinium- enhanced magnetic resonance imaging  
Miia Holmström, PhD, Helsinki University Central Hospital

**M6**

Impact of percutaneous coronary intervention of chronic total occlusion on left ventricular function using cardiac magnetic resonance imaging  
Gideon A. Paul, MD, Kings College Hospital

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*At the conclusion of this presentation, the attendee should be better able to...*
Concurrent Sessions 7.00 am – 8.00 am

**B C G**

**How to Publish in JCMR**

**7.00 am – 8.00 am**
Athena Auditorium

**7.00 am**
How to publish in JCMR
Dudley Pennell, MD, FESC, FACC, FRCP, Royal Brompton Hospital

Learning Objectives*
- Understand how to write a paper suitable for JCMR
- Improve likelihood of successful submission to JCMR
- Develop writing skills to improve scientific communication

**B C G**

**Cardiology Concepts for Non-Cardiologists 2: Common Pathophysiology of the Cardiovascular System**

**7.00 am – 8.00 am**
Room Thalie/Erato

**7.00 am**
What are ischemia, stunning and hibernation?
Bernhard L. Gerber, MD, PhD, FESC, Cliniques St. Luc UCL
Andreas Schuster, MD, King’s College London

Learning Objectives*
- Know about cardiovascular physiology, ischemia stunning and hibernation
- Use tests for detection of coronary artery disease employing detection of ischemia
- Use tests for detection of myocardial viability

**C G**

**Case Review Session: Multi-modality Cases from Australia**

**7.00 am – 8.00 am**
Room Clio

Cases from Australia: Multi-modality imaging/cardiac masses
Moderator:
Joseph Selvanayagam, MBBS, FRACP, Flinders Medical Centre

Learning Objectives*
- Understand clinical utility of CMR in the context of other imaging modalities
- Apply CMR to clinical patient management
- Understand some artifacts commonly seen in CMR

Presenters:
Jane McCrohon, St. Vincents Hospital
Christian Hamilton-Craig, University of Queensland
John Younger, MD, MS, Royal Brisbane and Women’s Hospital

**C G**

**Physics for Physicians 2: The Physics of CMR**

**7.00 am – 8.00 am**
Hermes Auditorium

**7.00 am**
Physics of cardiac imaging
Matthias Stuber, PhD, CHUV University of Lausanne

Learning Objectives*
- Understand physics relevant to cardiac MRI
- Understand sequences and motion suppression
- Understand relevant contrast enhancement mechanisms

**7.30 am**
Understanding ultrafast CMR pulse sequences
Sebastian Kozerke, PhD, University and ETH Zurich

Learning Objectives*
- Review basic pulse sequences used in CMR
- Describe effects of k-space undersampling on image appearance and noise
- Provide a grasp of parallel image and prior knowledge driven image reconstruction techniques

**CMR Technology Updates**

**8.00 am – 8.30 am**
Athena Auditorium

Moderators:
Eike Nagel, MD, King’s College London
Herbert Frank, MD, Landeskrankenhaus Tulln

**CMR Questionnaire**

**8.30 am – 9.00 am**
Athena Auditorium

Moderator:
Gerald M. Prohost, MD, University of Southern California
**CONCURRENT SESSIONS 9.00 am – 10.30 am**

**Lecture Session:**
**Myocardial Perfusion and Ischemia**
In Association with the European Association of PCI

9.00 am – 10.30 am  Athena Auditorium

*Moderators:*
Michael Jerosch–Herold, PhD, Brigham and Women’s Hospital
Jürg Schwitter, MD, University Hospital Lausanne

**9.00 am**
**What does an interventionalist expect from an imaging test?**
Carlo Di Mario, MD, PhD, Royal Brompton Hospital

**9.12 am**
**In which CAD patients is CMR today the test of choice?**
Albert C. van Rossum, MD, PhD, VU University Medical Center

**Learning Objectives**
- Understand the CMR perfusion techniques involved in assessing the diagnosis of ischemia in coronary artery disease (CAD)
- Understand the strengths and weaknesses of stress perfusion CMR in diagnosing CAD compared to nuclear techniques
- Know in which CAD patients CMR is the test of choice

**9.24 am**
**CMR for assessment of functional significance of coronary stenosis**
Stuart Watkins, MD, Sunnybrook Health Sciences Centre

**Learning Objectives**
- Appreciate the value of CMR myocardial perfusion imaging compared with other non-invasive imaging modalities for the diagnosis of significant coronary artery disease
- Appreciate the limitations of quantitative coronary angiography as a gold standard test in assessing a non-invasive test
- Understand the value of measuring fractional flow reserve and how this is performed

**9.36 am**
**Intravascular OCT and FFR assessment of coronary lesions: how to conciliate anatomic and physiologic information?**
Hiram Grando Bezerra, MD, PhD, Case Western Reserve University

**Learning Objectives**
- Understand the difference between anatomic information assessment and functional assessment
- Correlate invasive physiology with intravascular OCT
- Understand the potential additive value of physiological and anatomic assessment in coronary artery disease

**9.48 am**
**Unresolved technical issues and potential solutions in perfusion CMR**
Edward DiBella, PhD, University of Utah

**Learning Objectives**
- Better appreciate and reduce dark rim artifacts arising with myocardial perfusion imaging studies
- Understand the effect of poor ECG gating in myocardial perfusion imaging studies on qualitative and quantitative analyses
- Successfully perform and interpret myocardial perfusion scans at rest and stress with CMR

**10.00 am**
**Developments in myocardial perfusion imaging by CT and echocardiography: how do they compare with CMR?**
Joao A. C. Lima, MD, Johns Hopkins University

**Learning Objectives**
- Discuss differences in perfusion imaging by ultrasound, CT and MR
- Familiarize attendees with the concept of coronary flow reserve in patients with severe CAD
- Discuss the potential impact of perfusion on CAD patient selection for intervention

**10.12 am**
Panel discussion

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* At the conclusion of this presentation, the attendee should be better able to
Oral Abstract Session 8:  
**EP and Interventional Applications**

9.00 am – 10.30 am  Room Thalie/Erato

Moderators:
David Bluemke, MD, PhD, National Institutes of Health  
Marcus Y. Chen, MD, National Institutes of Health

9.05 am  O50
Paced segment characteristics predict clinical response to cardiac resynchronization therapy: results from the multimodality imaging assessment of pacing intervention in heart failure (mAPIt-HF) study  
Jorge A. Wong, MD, University of Western Ontario

9.17 am  O51
Multimodality imaging in transcatheter aortic valve implantation (TAVI): comparison between cardiovascular magnetic resonance, cardiac computed tomography and echocardiography  
Andrew Jabbour, BSc(Med), MBBS (Hons), PhD, Royal Brompton Hospital and Imperial College

9.29 am  O52
Improvement of LV functional performance in the chronic total coronary occlusion during the late stage is associated with the extensive collateral development  
Yuesong Yang, MD, PhD, Sunnybrook Health Sciences Centre

9.41 am  O53
Quantitative blush evaluator (QuBe) accurately quantifies microvascular dysfunction in patients with ST-Elevation Myocardial Infarction; comparison with cardiovascular magnetic resonance  
Christian Hamilton-Craig, MBBS FRACP, University of Queensland

9.53 am  O54
Real-time MR-guided transarterial aortic valve implantation (TAVI): in vivo evaluation in swine  
Harald H. Quick, PhD, University of Erlangen

10.05 am  O55
MR-guided cardiac interventions using MR-compatible devices: first-in-man clinical trial  
Aphrodite Tzifa, FRCPCH, King’s College London

10.17 am  O56
3D visualization of myocardial substrate using delayed enhancement MRI for pre-planning and guidance of ablation procedures of ventricular tachycardia  
Jose L. Rubio-Guivenau, MSc, Universidad Politécnica de Madrid & Ciber BBN

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Case Review Session: Congenital 1

9.00 am – 10.30 am  Room Clio

CMR cases: common congenital and adult congenital indications  
Moderators:  
Willem A. Helbing, MD, Erasmus MC-Sophia  
Tiffanie R. Johnson, MD, FAAP, FACC, Riley Hospital for Children  
Lars Grosse-Wortmann, MD, The Hospital for Sick Children

Learning Objectives*
> Understand CMR techniques used in imaging common congenital pathologies  
> Learn about some of the pitfalls in congenital CMR  
> Optimize imaging protocols in congenital CMR and post-operative follow up

Presenters:
Michael Silberbach, MD, Oregon Health & Science University  
Margaret M. Samyn, MD, Children’s Hospital of Wisconsin  
Karen Ordovas, MD, University of California San Francisco  
Taylor Chung, MD, Children’s Hospital Oakland  
Ann Marie Valente, MD, Children’s Hospital Boston  
Shin-Joo Yoo, MD, FRCPC, Hospital for Sick Children, University of Toronto

10.15 am
Panel discussion
**Oral Abstract Session 9:**

**Early Career Award – Basic Translational**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
<th>Institution</th>
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<tbody>
<tr>
<td>9.00 am</td>
<td>Longitudinal trends of remodeling mechanisms after acute myocardial infarction based on severity of ischemic insult: A quantitative MRI study</td>
<td>Nilesh R. Ghugre, PhD</td>
<td>Sunnybrook Health Sciences Centre</td>
</tr>
<tr>
<td>9.17 am</td>
<td>Monitoring of gadolinium uptake within the vessel wall during magnetic resonance (MR) guided angioplasty of the peripheral arteries with a paclitaxel/gadolinium coated balloon: an experimental study at 3T</td>
<td>Mirja Neizel, MD</td>
<td>University Hospital Düsseldorf</td>
</tr>
<tr>
<td>9.29 am</td>
<td>Dystrophinopathies are characterised by impaired cardiac metabolism, contractile dysfunction and fibrosis in patients with and without coxsackie B3 exposure</td>
<td>Joseph Suttie, MBBS FRACP</td>
<td>University of Oxford</td>
</tr>
<tr>
<td>9.41 am</td>
<td>Equilibrium contrast CMR for the detection of amyloidosis in mice</td>
<td>Adrienne E. Campbell, PhD candidate</td>
<td>University College London</td>
</tr>
<tr>
<td>9.53 am</td>
<td>Real-time MRI guided percutaneous transthoracic left ventricular access and closure</td>
<td>Israel M. Barbash, MD</td>
<td>National Institutes of Health</td>
</tr>
<tr>
<td>10.05 am</td>
<td>Quantitative T1-maps delineate myocardium at risk as accurately as T2-maps - experimental validation with microspheres</td>
<td>Martin Ugander, MD, PhD</td>
<td>National Institutes of Health</td>
</tr>
<tr>
<td>10.17 am</td>
<td>Non-contrast quantitative T1-mapping indicates that salvaged myocardium develops edema during coronary occlusion, whereas infarction exhibits evidence of additional reperfusion injury</td>
<td>Martin Ugander, MD, PhD</td>
<td>National Institutes of Health</td>
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</tbody>
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**Panel Discussion**
**Oral Abstract Session 10: CMR of Ischemia and Viability**

**Moderators:**
Raymond J. Kim, MD, Duke University
Holger Thiele, MD, University of Leipzig – Heart Center

<table>
<thead>
<tr>
<th>Time</th>
<th>Abstract Number</th>
<th>Title</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.05 am</td>
<td>O64</td>
<td>The role of dobutamine stress magnetic resonance in the clinical management of patients with coronary artery disease</td>
<td>Rolf Gebker, MD, German Heart Institute</td>
</tr>
<tr>
<td>11.17 am</td>
<td>O65</td>
<td>Serial quantification of myocardial infarction tissue heterogeneity during infarct healing by cardiac MRI provides strong characterization of left ventricular remodeling (the NHLBI PROSPECT-CMR Study)</td>
<td>Bobby Heydari, MD, Brigham and Women’s Hospital</td>
</tr>
<tr>
<td>11.29 am</td>
<td>O66</td>
<td>Impaired coronary vasodilation with Regadenoson in patients with angiographically normal coronaries when compared to normal volunteers – insights from quantitative MRI perfusion</td>
<td>Sujethra Vasu, MD, National Institutes of Health</td>
</tr>
<tr>
<td>11.41 am</td>
<td>O67</td>
<td>The relationship of the transmural extent of T2-edema compared with the transmural extent of infarction: implications for the assessment of the area-at-risk</td>
<td>Han W. Kim, MD, Duke University</td>
</tr>
<tr>
<td>11.53 am</td>
<td>O68</td>
<td>Utility of CMR for differentiating acute from chronic myocardial infarction - revisiting T2-weighted imaging with inclusion of intermediate aged infarcts</td>
<td>Martijn Smulders, MD, Maastricht University Medical Center</td>
</tr>
<tr>
<td>12.05 am</td>
<td>O69</td>
<td>Preservation of the relation between infarct characteristics and left ventricular remodeling following successful early revascularization for myocardial infarction: an observational study with contrast-enhanced cardiovascular MRI</td>
<td>Marlon A. Olimulder, MD, MST Enschede</td>
</tr>
<tr>
<td>12.17 am</td>
<td>O70</td>
<td>The yield of stress perfusion CMR in asymptomatic diabetics</td>
<td>Darach O h-lIci, MB BCh, Institut Cardiovasculaire Paris Sud, Hopital Prive Jacques Cartier</td>
</tr>
</tbody>
</table>

**Case Review Session: Cases from London CMR**

**Moderators:**
James Moon, MD, The Heart Hospital London
Mark Westwood, MRCP, MD, The London Chest Hospital

**Presenters:**
Thomas R. Burchell, MBBS, The London Chest Hospital
Neha Sekhri, MRCP, PhD, London Chest Hospital
John Paul Carpenter, MD, Royal Brompton Hospital
Andrew Flett, BSc, (Hons) MBBS MRCP, The Heart Hospital, University College London Hospital NHS Trust
Anna Herrey, MD, PhD, MRCP, The Heart Hospital Imaging Centre
Geraint Morton, MA, MBBS, King’s College London

**Lecture Session: Molecular Imaging**

**Moderators:**
Gregory Lanza, MD, PhD, Washington University School of Medicine
Victor A. Ferrari, MD, University of Pennsylvania

**Learning Objectives**
- Understand the specific steps in the development of molecular imaging agents
- Better comprehend the integration of clinical need and development strategies for molecular imaging agents
- Appreciate the potential conflicting factors related to optimization of imaging characteristics and ultimate clinical utility for molecular agents

**Robust quantitation in MR molecular imaging**

Shelton Caruthers, PhD, Washington University of Medicine

**Learning Objectives**
- Understand the importance of quantitative vs. qualitative MR molecular imaging
- Have an appreciation for some of the sources of variability in making accurate quantitative measurements
- Have an appreciation for some methods and techniques to overcome or correct for errors in quantitation
The role of magnetic resonance in image-guided drug delivery  
Gregory Lanza, MD, PhD, Washington University School of Medicine

Learning Objectives*  
> Understand the opportunities and challenges for clinical translation of T1w MR molecular imaging agents  
> Understand the potential for incorporating drugs with molecular imaging agents  
> Understand the importance of quantification for clinical use of molecular imaging in practice

Translational challenges and opportunities of T2* agents  
Robin Choudhury, MD, John Radcliffe Hospital

Learning Objectives*  
> Understand translational challenges  
> Understand translational opportunities of T2 agents  
> Understand molecular imaging using T2 agents

Stem cell approaches: tracking and qualification  
Dara Kraitchman, VMD, PhD, Johns Hopkins University

Learning Objectives*  
> Delineate the methods to label stem cells for tracking using CMR  
> Describe the methods most likely to be translated to the clinical for tracking stem cells and monitoring engraftment  
> Understand the hurdles to adoption of stem cell labeling methods and CMR’s role in the evaluation of stem cell

Panel discussion

12.30 pm – 1.30 pm Lunch (on own)  
Exhibits/Posters (Authors present)

Long-term follow-up after viral myocarditis established by endomyocardial biopsy: predictors of mortality  
Stefan Grün, MD, Robert-Bosch-Medical Center

Acute pulmonary vein isolation lesions consist of interstitial oedema and tissue necrosis: possible mechanism of pulmonary vein reconnection  
Aruna Arujuna, MRCP, King’s College London

Timing of cardiovascular magnetic resonance imaging after acute myocardial infarction: effect on estimates of infarct characteristics and prediction of late ventricular remodeling  
Adam N. Mather, MBBS, University of Leeds

Myocardial T1-mapping for early detection of left ventricular myocardial fibrosis in systemic sclerosis  
Franck Thuny, MD, Hopital Louis Pradel-Laboratoire Creatis

Comparing analysis methods for quantification of myocardial oedema in patients following reperfused ST-elevation MI  
Tom Burchell, MBBS, London Chest Hospital

Animal models of myocardial infarction for translational research  
Jürgen E. Schneider, PhD, Oxford University

Learning Objectives*  
> Explain benefits & limitations of animal models of myocardial infarction for translation research  
> List CMR techniques to characterize and quantify myocardial injury in these models  
> Give examples for the use of CMR in animal models of myocardial injury

Functional and clinical impact of microvascular obstruction in acute MI  
Katherine Wu, MD, Johns Hopkins Hospital

Learning Objectives*  
> Describe the pathophysiology of microvascular obstruction  
> Describe and compare the CMR-LGE methods of detecting and quantifying microvascular obstruction  
> Describe the CMR-LGE data supporting the effects of microvascular obstruction on post-MI LV remodeling and clinical prognosis

* At the conclusion of this presentation, the attendee should be better able to
2.00 pm
Microinfarct imaging with high resolution LGE: A new prognostic marker?
Jörg Barkhausen, MD, University Hospital Schleswig-Holstein
Learning Objectives*
> Perform MR examination in patients with suspected microinfarcts
> Distinguish microinfarcts from artifacts
> To judge the clinical impact of microinfarcts

2.15 pm
When CMR assessment improves patient management over conventional imaging in AMI patients
Raymond Kwong, MD, MPH, Brigham and Women’s Hospital
Learning Objectives*
> Name the pulse sequences and the corresponding myocardial features that CMR can use in assessment of acute myocardial infection
> Determine the reasons why the multifaceted approach by CMR provides incremental diagnostic ability over conventional imaging techniques
> Clinical situations that CMR can provide information that will alter patient management in patients presenting with acute MI

2.30 pm
Measuring treatment effects in clinical trials – how accurate is CMR?
Pierre Croisille, MD, PhD, Hôpital Cardiologique L. Pradel
Learning Objectives*
> Understand the new concepts driving current clinical trials in AMI patients
> Identify CMR imaging variables that can be used as surrogate endpoints in clinical trials
> Identify CMR strength and perspectives in clinical trials

2.45 pm
Panel discussion

C
Oral Abstract Session 11:
Novel Concepts or Techniques
1.30 pm – 3.00 pm  Room Thalie/Erato
Moderators:
Andrew Powell, MD, Children’s Hospital Boston
Anne Marie Valente, MD, Children’s Hospital Boston
1.35 pm  071
Accuracy of aortic pulse wave velocity assessment with velocity-encoded MRI: validation in patients with Marfan syndrome
Eleanore S. Kröner, MD, Leiden University Medical Center
1.47 pm  072
The cardiac atlas project: rationale, design and preliminary results
Pau Medrano-Gracia, MSc, MEng, The University of Auckland
1.59 pm  073
Evaluation of right ventriculoarterial coupling in pulmonary hypertension: a magnetic resonance study
Javier Sanz, MD, Mount Sinai School of Medicine
2.11 pm  074
Time resolved measure of coronary sinus flow following regadenoson administration
O. Julian Booker, MD, National Heart, Lung, and Blood Institute
2.23 pm  075
Validation of echocardiographic indices of right ventricular systolic function with cardiac magnetic resonance: a comparative study
Suchi K. Grover, MBBS, Flinders Medical Centre
2.35 pm  076
Myocardial fibrosis as an early cardiac marker of disease in patients with lamin A/C mutations
Andrea Barison, MD, Scuola Superiore Sant’Anna and Fondazione G. Monasterio CNR - Regione Toscana
2.47 pm  077
The role of late gadolinium enhancement of the right ventricular insertion point predicts survival in patients with pulmonary hypertension
Benjamin H. Freed, MD, University of Chicago Medical Center
Case Review Session: Heart Failure
Cases from the NIH and Cleveland Clinic
1.30 pm – 3.00 pm Room Clio

Cases of heart failure and from the NIH and Cleveland Clinic
Moderator:
Andrew E. Arai, MD, NHLBI – National Institutes of Health
Learning Objectives*
> Discuss CMR applications suitable for evaluating patients with heart failure
> Understand factors that lead to reduced image quality in patients with heart failure
> Learn methods for adjusting CMR image acquisition to customize to the special needs of patients with heart failure

Presenters:
Sujata Shanbhag, MD, NHLBI – National Institutes of Health
Steve Leung, MD, NHLBI – National Institutes of Health
Joel Wilson, MD, NHLBI – National Institutes of Health
Milind Desai, MD, Cleveland Clinic

Oral Abstract Session 12:
Physiology and Metabolism Including Spectroscopy
1.30 pm – 3.00 pm Hermes Auditorium

Moderators:
Haakan Arheden, MD, PhD, Lund University
Robert Weiss, MD, The Johns Hopkins University School of Medicine

1.35 pm
Local-look navigator gated and cardiac triggered echo-planar spectroscopic imaging of the heart
Kilian Weiss, MSc, University and ETH Zurich

1.47 pm
Assessment of in vivo metabolism in failing hearts using hyperpolarised 13C magnetic resonance
Marie A. Schroeder, D.Phil., Sunnybrook Research Institute

2.23 pm
Cardiac steatosis is associated with excess body weight in otherwise healthy adults
Rajarshi Banerjee, BM BCh MRCP DipPH, University of Oxford

2.35 pm
Visualization and quantification of 4D blood flow distribution and energetics in the right ventricle
Alexandru G. Fredriksson, Med student, Linköping University

2.47 pm
Diastolic preparation for left ventricular ejection - a marker of inefficiency of the failing heart
Jonatan Eriksson, MSc, Center Linköping University

3.00 pm – 3.30 pm Refreshment Break
Exhibits/Poster Viewing
(Authors not present)

Lecture Session: CMR-Guided Intervention
3.30 pm – 5.00 pm Athena Auditorium

Moderators:
Robert J. Lederman, MD, National Institutes of Health
Tobias Schaeffter, PhD, King’s College London

3.30 pm
iMRI for conducting intervention and predicting their outcome
Titus Kühne, PhD, German Heart Institute Berlin
Learning Objectives*
> Understand clinical indication of iMRI
> Conduct iMRI at his institute
> Judge the reliability using MRI data for predicting the outcome of intervention

3.42 pm
GPU-based reconstruction for iCMR
Michael S. Hansen, PhD, National Institutes of Health
Learning Objectives*
> Appreciate that there is a difference between real-time acquisition and real-time reconstruction
> Understand the time constraints for real-time image reconstruction for interventional imaging
> Identify core advantages of GPU reconstruction in iCMR and give examples of useful applications
3.54 pm
Computational fluid dynamics & procedure planning
Ajit P. Yoganathan, PhD, Georgia Institute of Technology

Learning Objectives*
> Application of MRI imaging processing to reconstructing complex Fontan anatomies
> Application of computational fluid dynamics to the Fontan circulation
> Application of surgical planning in pediatric cardiology

4.06 pm
Clinical iCMR procedures: A new milestone
Reza Razavi, MD, King’s College London

Learning Objectives*
> Role of iCMR in management of cardiovascular disease
> State of the art in iCMR
> Future clinical application of iCMR

4.18 pm
Approaches to attenuate heating during iCMR
Christina E. Saikus, PhD, National Institutes of Health

Learning Objectives*
> Identify safety considerations for devices in the MR environment
> Understand current approaches to attenuate potential heating during iCMR
> Recognize benefits and drawbacks of current approaches and possibilities for new techniques

4.30 pm
Transmit arrays to attenuate heating during iCMR
Greig C. Scott, PhD, Stanford University

Learning Objectives*
> Understand RF heart risks in cardiac MRI with interventional devices and implants
> Understand how transmit arrays can minimize and control RF coupling
> How guidewire and catheter devices can become micro-transmit array elements

4.45 pm
Panel discussion

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**Oral Abstract Session 13: Prognosticating CAD**

3.30 pm – 5.00 pm Room Thalie/Erato

**Moderators:**
Michael McConnell, MD, MSEE, Stanford School of Medicine
Sanjay Prasad, MD, Royal Brompton Hospital

**3.35 pm O85**
Prognostic value and determinants of a hypointense core in T2-weighted cardiac magnetic resonance in acute reperfused ST-elevation myocardial infarction
Holger Thiele, MD, University of Leipzig - Heart Center

**3.47 pm O86**
Gender differences in myocardial salvage and clinical outcome in patients with acute reperfused ST-elevation myocardial infarction
Ingo Eitel, MD, Heart Center Leipzig

**3.59 pm O87**
Stress myocardial perfusion imaging by cardiac magnetic resonance provides strong prognostic value to cardiac events in patients with diabetes
Otavio R. Coelho-Filho, MD, Brigham and Women’s Hospital

**4.11 pm O88**
Scar assessment by cardiac MRI can predict outcome in high-risk patients undergoing coronary artery bypass graft (CABG)
Abdalla Elagha, MD, National Institutes of Health

**4.23 pm O89**
Papillary muscle infarction and cardiovascular outcomes
Geetha P. Bhumireddy, MD, New York Methodist Hospital

**4.35 pm O90**
Bernhard L. Gerber, MD, PhD, FESC, Cliniques Universitaires St.Luc

**4.47 pm O91**
Implantable cardioverter defibrillator implantation and degree of left ventricular scarring predict survival in patients with severe ischemic cardiomyopathy
Deborah H. Kwon, MD, Cleveland Clinic Foundation
**Case Review Session: CMR in Cardiomyopathy**

3.30 pm – 5.00 pm  
Room Clio

Cases from the University of Pennsylvania: Approach to cardiomyopathies  
Moderator: Victor A. Ferrari, MD, University of Pennsylvania  
Learning Objectives:*  
> Understand the specific tools to optimize cardiomyopathy studies using CMR techniques  
> Recognize the particular patterns of late gadolinium enhancement in various cardiomyopathies  
> Learn how to implement various protocols for evaluating patients with cardiomyopathies  

Presenters:  
Victor A. Ferrari, MD, University of Pennsylvania  
Yuchi Han, MD, University of Pennsylvania  
Scott Akers, MD, PhD, University of Pennsylvania  
Harold Litt, MD, PhD, University of Pennsylvania

**Oral Abstract Session 14: Basic Translational: Myocardial, Perfusion, and Regional Strain**

3.30 pm – 5.00 pm  
Hermes Auditorium

Moderators:  
David Firmin, PhD, Royal Brompton Hospital  
Reza Nezafat, PhD, Harvard Medical School

3.35 pm  
Non-invasive cardiac magnetic resonance and electrical myocardial imaging assessment of CRT in patients with heart failure and left bundle branch block  
Fady Dawoud, PhD, Johns Hopkins University

3.47 pm  
Impaired myocardial perfusion on CMR is associated with increased numbers of classical monocytes in STEMI patients treated by primary PCI  
Lourens F.H.J. Robbers, MSc, MD, VU University Medical Center

3.59 pm  
Arterial spin labeled MRI detects clinically relevant increases in myocardial blood flow with vasodilation  
Zungho Zun, MS, University of Southern California

4.11 pm  
Myocardial systolic strain assessed by cardiovascular magnetic resonance relates to subclinical atherosclerosis in healthy young adults  
Adam J. Lewandowski, BSc, University of Oxford

4.23 pm  
Is the process of stabilization of carotid plaque more dynamic than expected? A high-resolution 3D-CMR statin-naive human study  
Robert W. Biederman, MD, FACC, FAHA, Allegheny General Hospital

4.35 pm  
Correlates of aortic pulse wave velocity measured by cardiac MRI  
Visali Kodali, MD, St. Francis Hospital

4.47 pm  
Combination of compressed sensing and parallel imaging with respiratory motion correction for highly-accelerated cardiac perfusion MRI  
Ricardo Otazo, PhD, New York University School of Medicine

**CONCURRENT SESSIONS**  
5.00 pm – 6.30 pm

**Lecture Session: Cost-Effectiveness of CMR**  
5.00 pm – 6.30 pm  
Athena Auditorium

Moderators:  
Sven Plein, MD, PhD, University of Leeds  
Raymond Kwong, MD, MPH, Brigham and Women’s Hospital

5.00 pm  
Cost-effectiveness with a focus on CMR  
Rory Hachamovitch, MD, MSc, Cleveland Clinic  
Learning Objectives:*  
> What are cost-effectiveness analyses and why are they important  
> Understand the challenges we face in assessing the cost-effectiveness of cardiovascular imaging modalities  
> What are the different types of cost-effectiveness analyses and their advantages and disadvantages

5.15 pm  
Cost-effectiveness analyses in the Euro CMR registry  
Jürg Schwitter, MD, University Hospital Lausanne  
Learning Objectives:*  
> Understand the impact of non-invasive imaging in the work-up of CAD with respect to costs  
> Understand the influence of disease prevalence and test performance to detect CAD non-invasively  
> Understand the complementary nature of prospective controlled clinical trials and registries to assess the impact of novel technologies on health care costs

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* At the conclusion of this presentation, the attendee should be better able to...
5.30 pm
Cardiac magnetic resonance in today’s economic climate; a cost-effective analysis
Vinayak A. Hegde, MD, Akron General Medical Center
Learning Objectives*
> Understand assessment of cost effectiveness
> Apply appropriate cost effectiveness analyses to studies with different research designs
> Provide medically cost effective patient care

5.45 pm
Cost analysis of adenosine-stress CMR – comparison with other modalities
Günter Pilz, MD, University of Munich
Learning Objectives*
> Judge the diagnostic accuracy and prognostic value of a normal stress CMR exam
> Estimate whether and to what extent CMR reduces the subsequent utilization of cardiac catheterization in patients suspected of having CAD
> Understand whether and in which subgroups the application of CMR in patients suspected of having CAD reduces cost by averting referrals to cardiac catheterization

6.00 pm
What are the basic steps in assessing cost-effectiveness of CMR?
Raymond Kwong, MD, MPH, Brigham and Women’s Hospital
Learning Objectives*
> Name the potential topics relevant for cost-effectiveness in CMR and why this issue is increasingly important
> Recognize the components required to perform the basic steps involved in a decision analysis model assessing the cost-effectiveness of novel imaging methods including CMR
> Name a number of resources to start data collection and planning of performing cost-effectiveness assessment of CMR

6.15 pm
Panel discussion

5.00 pm – 6.30 pm
Room Thalie/Erato

Moderators:
Bernhard Gerber, MD, PhD, FESC, Cliniques Universitaires St. Luc
Steffen Petersen, MD, PhD, FESC, Barts and The London NIHR

5.05 pm
CMR quantification of aortic regurgitation in asymptomatic patients with significant aortic regurgitation: prediction of clinical outcome
Saul G. Myerson, MB ChB, MD, FESC, University of Oxford Centre for Clinical Magnetic Resonance Research (OCMR)

5.17 pm
Assessment of myocardial scarring improves risk stratification in patients evaluated for cardiac defibrillator implantation
Igor Klem, MD, Duke University Medical Center

5.29 pm
Clinical utility of cardiac magnetic resonance T2 mapping for acute myocardial edema
Asad A. Usman, MD, MPH, Northwestern University

5.41 pm
Can cardiac MRI be the ‘crystal ball’ for risk stratification in dilated cardiomyopathy? The impact of an LV mid-myocardial stripe on LVAD and transplantation risk
Jose Venero, MD, Allegheny General Hospital

5.53 pm
Delayed enhancement cardiac magnetic resonance imaging predicts future arrhythmic events in primary prevention ICD candidates irrespective of ischemic or non-ischemic etiology
James A. White, MD, London Health Sciences Centre

6.05 pm
Right ventricular dysfunction predicts clinical outcomes following cardiac resynchronization
Francisco Alpendurada, MRCP, Royal Brompton Hospital

6.17 pm
The utility of delayed-enhancement and T2-weighted cardiovascular MRI for predicting clinical outcomes in patients at high risk for cardiac sarcoidosis
Yongkasem Vorasettakarnkij, MD, Massachusetts General Hospital
Case Review Session: Congenital 2
Interactive Case Discussion
5.00 pm – 6.30 pm
Room Clio

Interactive case discussions in congenital and adult congenital heart disease
Moderators:
Sonya Babu-Narayan, MD, BS, BSc, MRCP, Royal Brompton Hospital
Tiffanie R. Johnson, MD, FAAP, FACC, Riley Hospital for Children
Michael Taylor, MD, PhD, Cincinnati Children’s Hospital Medical Center

Learning Objectives*
> Understand the use of CMR and other imaging modalities for the diagnosis of congenital and adult congenital heart disease
> Understand physiologic and/or anatomic principles of particular forms of congenital and adult congenital heart disease
> Understand how CMR influences patient management

Presenters:
Adam Dorfman, MD, University of Michigan Health Systems
Stephen Cook, MD, Nationwide Children’s Hospital
Ashwin Prakash, MD, Children’s Hospital Boston
Ruchira Garg, MD, FACC, Miami Children’s Hospital
Kevin K. Whitehead, MD, PhD, Children’s Hospital of Philadelphia

Oral Abstract Session 16: Basic Translational Myocardial Scar, Fibrosis, and Edema
5.00 pm – 6.30 pm
Hermes Auditorium

Moderators:
Matthias Friedrich, MD, FESC, FACC, Stephenson CMR Centre at the Libin Cardiovascular Institute of Alberta
Michael Lustig, PhD, MSc, UC Berkeley

5.05 pm
Fuzzy-logic, manual and semi-automated 2SD-based approaches for quantification of myocardial necrosis from late contrast enhancement magnetic resonance images: comparison with biochemical assessment of infarct size and left ventricular volumes and function early after myocardial infarction
Nicolas Baron, Graduate, Centre Hospitalier de Versailles

5.17 pm
Rapid cardiac T1 mapping within two heartbeats
Elodie Breton, PhD, NYU Langone Medical Center

5.29 pm
The quantification and role of diffuse myocardial fibrosis in familial dilated cardiomyopathy - an equilibrium contrast CMR study
Daniel M. Sado, MRCP, The Heart Hospital

5.41 pm
Identification of myocardial extracellular matrix expansion by cardiac MRI in hypertensive patients
Francois-Pierre Mongeon, MD, Brigham and Women’s Hospital

5.53 pm
Early detection of myocardial fibrosis in type II diabetic patients using MR T1-mapping
Helene Thibault, MD, PhD, Louis Pradel Hospital and Inserm U886

6.05 pm
Development of myocardial edema following acute bouts of intense physical exertion in healthy active men: a cardiovascular magnetic resonance (CMR) study
Myra S. Cocker, PhD Candidate, Stephenson Cardiovascular Magnetic Resonance Centre

6.17 pm
Myocardium area at risk measured with delayed enhancement after scar remodeling compared with T2-weighted cardiac magnetic resonance imaging
Jacob T. Lønborg, MD, University Hospital of Copenhagen

Award Reception
6.45 pm – 8.00 pm
Agora 2

* At the conclusion of this presentation, the attendee should be better able to
SCMR/Euro CMR SCIENTIFIC SESSIONS
FEBRUARY 6, 2011

CONCURRENT SESSIONS  7.00 am – 8.00 am

B C G

Cardiology Concepts for Non-Cardiologists 3: Risk versus Benefit in Cardiovascular Medicine
7.00 am – 8.00 am  Athena Auditorium

7.00 am
Cost and benefit in diagnostic medicine
Rory Hachamovitch, MD, MSc, Cleveland Clinic
Learning Objectives*
> Understand the principles underlying the analysis of cost and benefit in diagnostic medicine
> Understand the importance of cost-effectiveness and cost-benefit analyses in the current healthcare environment
> Understand and interpret the cost and benefit literature

7.30 am
Radiation burden
Rosa Sicari, MD, PhD, FESC, CNR Institute of Clinical Physiology
Learning Objectives*
> Know radiological doses and long-term risks of common cardiological examinations
> Decide appropriateness of medical imaging based on risk-benefit assessment
> Make a comparative assessment of different imaging techniques

C G

Physics for Physicians 3: Using Physics to Optimize Cardiovascular MR Images
7.00 am – 8.00 am  Hermes Auditorium

7.00 am
Optimizing pulses sequences for myocardial perfusion and LGE
Michael Jerosch-Herold, PhD, Brigham and Women’s Hospital
Learning Objectives*
> Understand how the pulse sequence for myocardial perfusion imaging and LGE work, and what sequence variants are most commonly used
> Optimize the parameter settings of the sequences, and adapt them to the CMR exam requirements, using an understanding of the typical trade-offs involved in balancing the CMR protocol with the study requirements
> Understand the most common problems and artifacts that occur with myocardial perfusion and LGE imaging, and how to avoid them

7.30 am
Optimizing pulse sequences for challenging patients – what to compromise?
Reza Nezafat, PhD, Harvard Medical School
Learning Objectives*
> How to optimize imaging parameters for cardiac MRI
> How to deal with afib
> Understand various methods to reduce imaging artifacts for CMR

C G

Case Review Session: Mixed Cases from Latin America
7.00 am – 8.00 am  Room Risso

Cases from Latin America
Moderator:
Carlos E. Rochitte, MD, PhD, Instituto do Coração
Learning Objectives*
> Recognize diseases seen more frequently in South America
> Understand the role of CMR in diagnosing cardiac diseases common in South America
> Understand role of CMR versus other imaging modalities

Presenters:
Carlos E. Rochitte, MD, PhD, Instituto do Coração
Juliano de Lara Fernandes, MD, PhD, University of Campinas (UNICAMP)

CONCURRENT SESSIONS  8.00 am – 9.30 am

B C G

Lecture Session: Best Clinical Practice
8.00 am – 9.30 am  Athena Auditorium

Moderators:
Charles Higgins, MD, University of California, San Francisco
Christopher M. Kramer, MD, University of Virginia

8.00 am
SCMR standardized protocols and variability of CMR measurements
Christopher M. Kramer, MD, University of Virginia
Learning Objectives*
> Understand the use of SCMR standardized protocols
> Understand for which applications CMR measures are not standardized
> Plan what studies are needed to standardize protocols and measurements

8.12 am
SCMR standardized reporting guidelines
Oliver Bruder, MD, Elisabeth Krankenhaus Essen
Learning Objectives*
> Understand and apply the SCMR standardized reporting guidelines

8.24 am
Developments in CMR accreditation and reimbursement: radiology perspective
Jens Bremerich, MD, University Hospital Basel
Learning Objectives*
> Oversee the legal situation for authorization of radiologists for cardiac imaging in Europe
> Understand accreditation procedure for cardiac imaging for radiologists in Europe
> See the heterogeneity of reimbursement of cardiac CT and MR in Europe

Color Legend for Tracks:  B = Basic Science  C = Congenital  G = General

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8.36 am
Developments in CMR accreditation and practice: cardiology perspective
Gerald M. Pohost, MD, University of Southern California
Learning Objectives*
> Know how to become credentialed in CMR in the US
> Know what bodies are available for CMR
> Know the SCMR recommendations for levels of practice and credentialing

8.48 am
Challenges and opportunities for CMR in China
Jianming Cai, MD, PhD, Chinese PLA General Hospital
Learning Objectives*
> Know the achievements for cardiovascular MR in China
> Understand the challenges for cardiovascular MR in China
> Know the opportunities for cardiovascular MR in China

9.00 am
News on safety: CMR of implantable devices and NSF
Scott D. Flamm, MD, Cleveland Clinic
Learning Objectives*
> Recognize the risks and potential benefits of performing CMR in patients with pacemakers and ICDs
> Understand the identification of and risks for development of nephrogenic systemic fibrosis
> Describe the current screening procedures and strategies for avoiding NSF

8.15 am
CMR of myocardial structure, function, and perfusion in mouse and rat models
Frank Kober, PhD, Université de la Méditerranée
Learning Objectives*
> Overview techniques and applications of multimodal CMR in animal models
> Understand basics of myocardial perfusion in animal models and how to measure it
> Understand the fundamental differences between perfusion MR in rodents and in humans
> Choose an appropriate anesthetic used for CMR in rodents

8.30 am
31P MRS in animal models of ischemia and translation to human
Robert Weiss, MD, Johns Hopkins Hospital
Learning Objectives*
> 31P MRS methods used in animal studies
> Common findings and metabolic results from 31P MRS studies in ischemic and failing animal hearts
> Methods for acquiring heart data from 31P MRS in people

8.45 am
Cellular and molecular CMR in animal models
Gustav Strijkers, MD, Eindhoven University of Technology
Learning Objectives*
> Understand the differences between human and small animal cardiovascular MRI imaging, and understand some of the special MRI sequences for imaging the cardiovascular system of mice
> Define the criteria on the basis of which to choose the best contrast agent for a specific cellular or molecular cardiovascular imaging application
> Understand the translational limitations of the new molecular MR imaging agents

9.00 am
Infarct core, peri-infarct zone, and area-at-risk imaging in animal models
Otavio R. Coelho-Filho, MD, Brigham and Women’s Hospital
Learning Objectives*
> Understand the potential applications, limitations of a variety of experimental models of myocardial infarction
> Understand why CMR is suitable to assess cardiovascular morphology and physiology in animal’s models of myocardial infarction
> Identify the advantage and disadvantage of different criteria for infarct tissue heterogeneity assessment
> Understand the potential role of tissue heterogeneity in the development of arrhythmias after MI and cardiac death

9.15 am
Panel discussion

9.30 am – 10.00 am Refreshment Break
Exhibits/Poster Viewing (Authors not present)

* At the conclusion of this presentation, the attendee should be better able to
Lecture Session: Emerging Imaging Modalities in Cardiology

10.00 am – 11.30 am  Athena Auditorium

Moderators:
Jörg Barkhausen, MD, University Hospital Schleswig-Holstein
Gregory Lanza, MD, PhD, Washington University School of Medicine

10.00 am
MR-elastography
Ralph Sinkus, PhD, ESPCI

Learning Objectives*
> Understand the basic concept of elastography, in particular the MR approach including the MR-sequences and its synchronization with the mechanical excitation
> Understand the difference between tissues' mechanical properties regarding compression and shear and its implication for elastography
> Understand the impact of MRE for staging liver fibrosis, characterizing liver tumors, assessing de-myelination effects in white matter

10.15 am
Ultra-high-field cardiac MR; 7T and beyond
Saskia van Elderen, MD, Leiden University Medical Center

Learning Objectives*
> Define the principal advantages and challenges of high field MR for cardiac imaging
> Describe the current state of knowledge in the field of in vivo human 7 Tesla cardiac MR
> Explore the most promising cardiac MR applications at 7 Tesla for patient care

10.30 am
MR-PET and PET-CT
Zahi Fayad, PhD, Mount Sinai School of Medicine

Learning Objectives*
> To demonstrate the methods of plaque imaging with MRI, PET, CT
> To understand the advantages and limitations of plaque molecular imaging using MRI, PET, CT
> To discuss the preclinical and clinical relevance of plaque molecular imaging by MRI, PET, CT

10.45 am
Magnetic particle imaging
Jörn Borgert, PhD, Philips Technologie GmbH

Learning Objectives*
> Understand the technical potential and the limitation of the presented new technology named magnetic particle imaging
> Understand the potential application of magnetic particle imaging in cardio-vascular applications
> Understand the link between tracer and instrumentation and their joint impact on the performance of the method

11.00 am
Simultaneous 1H/19F imaging
Samuel A. Wickline, MD, Washington University School of Medicine

Learning Objectives*
> Understand the role that fluorine magnetic resonance imaging could play in quantitative MRI for diagnosis of arteriosclerosis
> Understand the potential for dual proton and fluorine magnetic resonance imaging methods in cardiovascular molecular imaging
> Understand the principles and uses of nano particle-based fluorine and proton agents for cardiovascular MRI and conjunctive drug delivery

11.15 am
Panel discussion

Lecture Session: CMR in Electrophysiology Procedures

10.00 am – 11.30 am  Hermes Auditorium

Moderators:
Andrew M. Taylor, MD, UCL, Institute of Child Health
Graham Wright, PhD, Sunnybrook Health Sciences Centre

10.00 am
Atrial fibrillation ablation using iCMR
Gaston R. Vergara, MD, University of Utah

Learning Objectives*
> Understand the current use of CMR for management and treatment of patients with atrial fibrillation
> Understand the main challenges and advantages of performing RF ablation for treatment of atrial fibrillation in MRI environment
> Understand the concept of real-time CMR visualization of lesions caused by RF ablation

10.12 am
CRT planning and lesion assessment
Dana C. Peters, PhD, Beth Israel Deaconess Medical Center

Learning Objectives*
> Acquire and analyze images for assessment of ablation lesions, in patients after pulmonary vein isolation or VT ablation, both acutely after the procedure, and at later time points
> Acquire and analyze cardiac MR images for planning a cardiac resynchronization therapy (CRT) procedure
> Incorporate cardiac MR data into pre- and post-procedural evaluation for EP procedures
10.24 am
Electromechanical modelling of the heart for EP and CRT planning
Maxime Sermesant, PhD, INRIA

Learning Objectives*
> Understand how computer models can be used to fuse the different sources of clinical data (anatomy, EP,...)
> Understand how computer models can be adjusted to be patient-specific
> See how computer models can be used to test different therapeutic strategies

10.36 am
MR-guided EP and devices
Wolfgang R. Bauer, MD, PhD, University of Hospital Würzburg

Learning Objectives*
> Understand the epidemiological conflict between indication for increasing number of MR-imaging procedures and growing number of device implants (pacemakers, ICD's)
> Understand the mechanism responsible for making MR imaging hazardous for device and EP electrodes. What makes an electrode MR conditional safe?
> Why is there a need for doing EP procedures in the MR? What besides safety (see above) demands MR imaging from an EP catheter (tracking, visibility, visualization of therapy...)

10.48 am
EP ablation using iCMR
Henry R. Halperin, MD, MA, FAHA, FHRS, Johns Hopkins University

Learning Objectives*
> Understand the factors that lead to recurrences of arrhythmias after ablation including reversible conduction block and gaps in ablation lines
> Understand the use of iCMR in visualizing cardiac ablation lesions, filling in gaps in ablation lines, and guiding ablation procedures
> Understand the technological problems in implementing real time iCMR, and the time course for their resolution

11.00 am
Active catheter and visualization concepts
Michael Guttman, MS, Johns Hopkins University

Learning Objectives*
> Understand some methods used for tracking and displaying the positions of catheter-mounted coils
> Know pros and cons of ‘passive’ versus ‘active’ tracking methods
> Understand how active catheters can facilitate navigation through arteries and heart cavities

11.15 am
Panel discussion
11.30 am – 1.00 pm

Closing Plenary Session: Controversies in CMR

11.30 am – 1.00 pm

Athena Auditorium

Moderators:
Raymond Kwong, MD, MPH, Brigham and Women’s Hospital
Joseph Selvanayagam, MBBS, FRACP, Flinders Medical Centre

11.30 am

Pro: T1 mapping is useful for clinical CMR
Daniel Messroghli, MD, Charite Berlin

Learning Objectives*
> Explain the difference between T1 mapping and conventional MRI techniques
> Name 3 potential clinical applications for cardiac T1 mapping
> Define the technical prerequisites for cardiac T1 mapping

11.52 am

Con: T1 mapping is not ready for clinical use
Tobias Schaeffter, PhD, King’s College London

Learning Objectives*
> Rate the status of T1 mapping for clinical practice
> Know the pitfalls of T1 mapping acquisition techniques
> Know the influence of analysis technique on the T1 relaxation times

12.15 pm

Pro: T2 edema imaging can make a difference in patient management today
Daniel Kim, PhD, New York University

Learning Objectives*
> Understand the basic pathophysiology of myocardial edema due to acute myocardial injury
> Understand the basic MR physics behind T2-weighted CMR and its sensitivity to edema
> Appreciate the clinical use of T2-weighted CMR for diagnosis of myocardial edema

12.37 pm

Con: T2 edema imaging is not ready for use in clinical practice
Robert W. Biederman, MD, Allegheny General Hospital

Learning Objectives*
> Understand the value of T2 imaging
> Understand the limitations of T2 imaging when employed in ischemia/infarct imaging
> Define when T2 imaging is of value and when it may not be
# Technologist Workshop

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<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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<tr>
<td>1.00 pm – 6.00 pm</td>
<td>Room Risso</td>
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## 1.00 pm – 1.05 pm
**Welcoming remarks**
Susan Eder, ARRT, (MR) (RT), Emory Crawford Long Hospital

## 1.05 pm – 3.00 pm
The “how to” basics of CMR

**Moderator:**
Ralph Gentry, ARRT, William Beaumont Hospital

#### Learning Objectives*
- Appreciate the source of signal generation from which CMR images are created
- Appreciate the basic physics behind CMR image acquisition and reconstruction
- Understand the need for and basic forms of motion compensation or correction in CMR

## 1.40 pm
It’s a balancing act – pulse sequences & parameters
John Oshinski, PhD, Emory University Hospital

#### Learning Objectives*
- Understand the tradeoffs between spatial and temporal resolution in CMR
- Understand the tradeoffs between imaging time and image quality in CMR
- Understand the implications of changing MRI contrast parameters on imaging time and image quality in CMR

## 2.15 pm
Implants and devices – the current safety guidelines
Loren Budge, MD, University of Virginia Health System

#### Learning Objectives*
- Understand the current safety guidelines and best practices in CMR regarding medical devices and implants
- Recognize the impact on patient safety of following the guidelines
- Become familiar with ongoing advances in device and implant compatibility with MR

## 3.00 pm – 3.30 pm
Refreshment Break

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* At the conclusion of this presentation, the attendee should be better able to
Technologist Workshop
8.30 am – 5.30 pm  Room Risso

8.30 am – 10.20 am
Understanding & imaging acquired heart disease

Moderator:
Elizabeth A. Goddu, RT, Beth Israel Deaconess Hospital

8.30 am
Imaging cardiomyopathies
Peter Drivas, RT, Royal Brompton Hospital

Learning Objectives*
> Differential the different types of cardiomyopathies using MRI
> Understand the importance of imaging cardiomyopathies
> Select the most suitable imaging sequences in order to best demonstrate the appropriate cardiomyopathy

9.10 am
Imaging right ventricular dysplasia
Denise Kleindienst, RT, Franz-Volhard-Klinik, Charité Universitätsmedizin Berlin

Learning Objectives*
> New guidelines since Marcus et al 2010
> Cine imaging for global and regional functional abnormalities of the RV and right ventricular outflow tract is essential
> Understand the significance of fatty infiltrations of the RV

9.45 am
Imaging congestive heart failure
Amy Marisa West, MD, University of Minnesota

Learning Objectives*
> Identify the CMR imaging techniques used in a comprehensive examination of patients with congestive heart failure
> Recognize the common cardiac pathologies that result in congestive heart failure
> Be familiar with newer imaging techniques used in the research setting for patients with congestive heart failure

10.30 am – 11.00 am  Refreshment Break

11.00 am – 12.30 pm
Abstracts & post processing

Moderator:
Susan Eder, ARRT, (MR) (RT), Emory Crawford Long Hospital

11.00 am
Best abstract presentation
Safety of adenosine stress perfusion cardiac magnetic resonance imaging in patients with aortic stenosis
Stephen Darty, BS, RT-N, MR, Duke Cardiovascular Magnetic Resonance Centre

11.15 am
Post processing
Mercedes Pereyra, MBA, BS, RT (MR)(CT), Circle Cardiovascular Imaging

Learning Objectives*
> Know why to use protocols to scan a patient with regard to the post analysis process
> LV function analysis and acquisition parameters
> Quantification and measurements essential to reach a diagnosis

12.15 pm – 1.30 pm  Lunch (on own)

1.30 pm – 3.00 pm
Elements of myocardial viability

Moderator:
Pamela Vincent, MPA, RT, National Institutes of Health

1.30 pm
Why CMR stress viability is necessary:
The clinical perspective
Stamatios Lerakis, MD, Emory University

Learning Objectives*
> Understand the importance of stress MRI
> Understand the importance of viability by CMR
> Understand the clinical importance of both stress CMR and viability findings

2.00 pm
Myocardial viability – a tech’s perspective
Filip DeRidder, MD, UZ Brussels

Learning Objectives*
> Understand the need of myocardial viability
> How to perform myocardial viability, tips and tricks
> Be familiar with different types of myocardial viability protocols

* At the conclusion of this presentation, the attendee should be better able to
2.30 pm
Stress the patient not the technologist
Alison Fletcher, RT, Southampton General Hospital
Learning Objectives*
> Accurately decide which views should be acquired and plan these relevant to clinicians protocol to achieve the most diagnostic scan
> Change the protocol in line with physiological changes in the patient during adenosine administration, whilst understanding how these changes effect the image and scan acquisition to provide the highest achievable diagnostic image quality
> Perform adenosine stress CMRI, understanding physiological changes and complications and adjusting the MR sequence with confidence, knowledge and understanding

3.00 pm – 3.30 pm  Refreshment Break

3.30 pm – 5.30 pm
CE-MRA techniques & studies
Moderator:
Alison Fletcher, RT, Southampton General Hospital

3.30 pm
CE-MRA techniques & tips
Ricardo Wage, DCR (R), RBH NHS and Harefield Hospital
Learning Objectives*
> Learn the proper timing of performance CE MRA
> Learn how to rectify if they missed the contrast timing
> The attendee will have the choice to choose the dynamic angle and proper timing of contrast

4.00 pm
Protocol guidelines: imaging the aorta and beyond
James Shambrook, MD, Southampton University Hospitals NHS Trust
Learning Objectives*
> Understand the variety of clinical roles for contrast enhanced MR angiography
> Identify common aortic and other vascular pathologies which can be seen at MR angiography
> Appreciate how evolving MR angiographic techniques, such as time resolved angiography, can be used in clinical practice

4.30 pm
Coronary imaging
Rene Botnar, PhD, King’s College London
Learning Objectives*
> Understand the imaging principles of coronary lumen and vessel wall imaging
> Understand the different MR sequences available for coronary lumen and wall imaging
> Understand the basic principles of respiratory motion correction

5.00 pm
Quiz the techs
Ricardo Wage, DCR (R), RBH NHS and Harefield Hospital
James Shambrook, MD, Southampton University Hospitals NHS Trust
Learning Objectives*
> Understand the clinical utility of contrast enhanced MRA
> Appreciate the problem solving ability of MRA
> Understand how MRA data can be processed for increased diagnostic yield

* At the conclusion of this presentation, the attendee should be better able to
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O38 Safety of adenosine stress perfusion cardiac magnetic resonance imaging in patients with aortic stenosis
Stephen Darty, BS, RT-N, MR, Duke Cardiovascular Magnetic Resonance Center

P353 MRI image sequencing of calcified myocardial masses: liquefaction necrosis of mitral annular calcification (LNMAC), David Collins, MS, The Christ Hospital, Cincinnati, OH

P354 Manual versus automatic inline ventricular function assessment using MRI
Marie Wasielewski, RT, Northwestern University, Chicago, IL

P355 Image based background magnetic field correction for aortic and pulmonary artery flow measurement using phase contrast
Joshua Cheng, RT, St. Francis Hospital, Roslyn, NY

P357 Patient and device related factors affecting artifact size and cardiac visualization when performing cardiac MRI in patients with implanted defibrillators
Cheryl Carroll, BS, RT, University of Pennsylvania Medical Center, Philadelphia, PA

* At the conclusion of this presentation, the attendee should be better able to
POSTER INFORMATION

Poster Sessions with Authors

FRIDAY, FEBRUARY 4, 2011
6.30 pm – 7.30 pm  Rhodes Area

POSTER SESSION 1 – Not accredited for CME
You are invited to meet the authors of the following posters on Friday evening during the Wine and Cheese Reception. This year, the posters presented on each day will correspond with the topics being presented in the Oral Abstract Sessions.

Clinical Role of CMR Against Other Modalities:
P 032, 074-077, 243, 244

Congenital: New Frontiers in Therapy or Patient Prognostication:
P 185-193

Improving Technical Quality or Robustness:

Novel CMR Methods in Cardiomyopathy:
P 064, 174-177, 265-289, 299, 300-307, 310-342

Novel Concepts or Techniques:

Vascular MRI: P 379-389, 391-393

SATURDAY, FEBRUARY 5, 2011
12.30 pm – 1.30 pm  Rhodes Area

POSTER SESSION 2 – Not accredited for CME
You are invited to meet the poster authors on Saturday afternoon from 12:30 pm – 1:30 pm. This year, the posters presented on each day will correspond with the topics being presented in the Oral Abstract Sessions.

CMR of Ischemia and Viability:
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Congenital Novel Concepts and Techniques:
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EP and Interventional Applications: P 245-260

Myocardial, Perfusion, and Regional Strain:
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Myocardial Scar, Fibrosis, and Edema:
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Physiology and Metabolism including Spectroscopy:
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CMRtools from CVIS is a versatile software package that allows interactive viewing and functional analysis of CMR images. Built on years of clinical research in CMR, it allows state-of-the-art image analysis, quantification and visualization on a standard PC.

Circle Cardiovascular Imaging Inc. is a Calgary based company that develops analytical software for the cardiac imaging community. Circle’s product suite, c42, is engineered for use in cardiac imaging. c42 is developed by physicians for physicians, and thereby combines an intuitive user interface and analysis tool set, and has been designed specifically to facilitate efficient quantitative evaluation of cardiac imaging studies. The first software in the product suite, cmr42 is designed for use in Cardiovascular MR.

Diagnosoft develops and markets state-of-the-art cardiac quantification software solutions and clinical reporting for hospitals, research and teaching institutions, medical imaging centers and private practices. Our solutions analyze cardiac MR images for global and regional function. Our flagship product, Diagnosoft HARP (FDA cleared), enables regional function quantification of the heart based on tagged cardiac MR images. Diagnosoft is a privately held company based in Cary, North Carolina, USA.

The ESC Working Group (WG) on Cardiovascular Magnetic Resonance (CMR) aims at being the representative trans-national scientific organisation for physicians, scientists, and technologists who work in the field of CMR. Our mission is to stimulate and disseminate the knowledge and the use of CMR through education, quality control, research, and training. Do not miss our state-of-the-art annual congress and educational courses. Membership is free and unlimited.
Imricor is developing innovative MRI compatible electro-physiology (EP) technology, including the VisionTM ablation catheter and the BridgeTM MR EP Recording System, intended for the treatment of patients with cardiac arrhythmias. Headquartered in Minneapolis, USA, Imricor’s management team includes leading experts in the development of MRI compatible and EP medical devices.

JCMR, the official journal of the Society for Cardiovascular Magnetic Resonance, is an open access, online journal that publishes articles on all aspects of basic and clinical research on the design, development, manufacture, and evaluation of magnetic resonance methods applied to the CMR system. The only journal devoted exclusively to CMR, JCMR aims to provide an international forum for communicating the latest findings and reviews on the burgeoning field of CMR imaging and spectroscopy.

Medis is a leading provider of software solutions for the quantification of cardiovascular MR images. At SCMR/EuroCMR 2011, you can learn more about the spectacular new version of Medis QMass® MR, which is powered by Visia™ Enterprise. High-quality quantification is now complemented with smooth DICOM connectivity, versatile reviewing, and personal worklists that you can access whenever and wherever you want. Visit Medis at booth 6 for more information or a demo.

Royal Philips Electronics of the Netherlands (NYSE: PHG, AEX: PHI) is a diversified health and well-being company, focused on improving people’s lives through timely innovations. As a world leader in healthcare, lifestyle and lighting, Philips integrates technologies and design into people-centric solutions, based on fundamental customer insights and the brand promise of “sense and simplicity”. The company is a market leader in cardiac care, acute care and home healthcare, energy efficient lighting solutions and new lighting applications, as well as lifestyle products for personal well-being and pleasure with strong leadership positions in flat TV, male shaving and grooming, portable entertainment and oral healthcare.
PIE MEDICAL IMAGING
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Pie Medical Imaging offers quantitative cardiovascular analysis software for MR images. The CAAS MRV software allows for Functional, Viability and First Pass Perfusion analysis of the left and right ventricles. A version especially designed for small animal research, called CAAS MRV FARM, also is available. Another solution in the MRI product range is CAAS MR Flow, to quantify flow and velocities in phase contrast MR images.

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The Society for Cardiovascular Magnetic Resonance (SCMR) is an international organization dedicated to the education of physicians and allied healthcare professionals in the application of magnetic resonance to the heart and circulation; to the promotion and dissemination of the understanding and appropriate use of techniques; and to the provision of a forum pursuant of clinical, research, and other issues relevant to the field.

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SCMR/NHLBI Cardiovascular MRI "State of the Art" Course
Natcher Conference Center at the NIH, Bethesda, MD
June 12-13, 2011

SCMR 2012
Marriott World Center, Orlando, FL
February 2-5, 2012

SCMR 2013
Hilton San Francisco, San Francisco, CA
February 1-4, 2013

www.scmr.org
SCMR VISION STATEMENT
The Society for Cardiovascular Magnetic Resonance (SCMR) aims to be the recognized representative and advocate for physicians, scientists, and technologists who work in the field of cardiovascular magnetic resonance (CMR). It endeavors to be the principal international, independent organization committed to the further development of CMR through education, quality control, research and training.

The mission of SCMR is to:
> Foster optimal clinical effectiveness of CMR through professional education, establishment of standards for quality assurance and professional training, continuing medical education, and development of evidence-based guidelines to enhance patient care and improve the quality of cardiovascular medical practice.
> Support coordinated research efforts to promote further development and applications of CMR, and to investigate accuracy, effectiveness, and cost-effectiveness in cardiovascular diagnosis.
> Provide a forum for scientific exchange and information on CMR, through organization of an annual international scientific session and of additional smaller meetings, through on-line open access publication of the Journal of Cardiovascular Magnetic Resonance, and through establishing close working relationships with societies in related fields.
> Build a strong national and international membership body of physicians, scientists, technologists, administrators and other individuals with interest in clinical applications or research in CMR.
> Develop relevant member services, resources and assistance to enhance the development of the field of CMR.

Euro CMR MISSION STATEMENT
The mission of the ESC Working Group on Cardiovascular Magnetic Resonance is to:
> Promote the knowledge of optimal clinical effectiveness of CMR through professional education, establishment of standards for quality assurance and professional training, continued medical education, and development of evidence-based guidelines for its use to enhance patient care and improve the quality of cardiovascular medical practice.
> Support coordinated research efforts to promote further development and applications of CMR, and to investigate accuracy, effectiveness, and cost-effectiveness in cardiovascular diagnosis.
> Provide a forum for scientific exchange and information on CMR, through organization of an annual scientific conference, through the organization of training courses directly or through scientific sponsorship and through establishing close working relationships with societies in related fields.
> Provide the possibility of a European accreditation facility to assure the homogeneity of CMR examination through Europe.
> Build a strong European membership body of physicians, scientists, technologists, with interest in clinical applications or research in CMR.